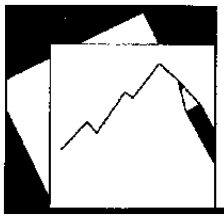
WP/00/139



IMF Working Paper

Reforming Pensions: Myths, Truths, and Policy Choices

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INTERNATIONAL MONETARY FUND

 WP/00/139

IMF Working Paper

Fiscal Affairs Department

Reforming Pensions: Myths, Truths, and Policy Choices

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Authorized for distribution by Richard Hemming

August 2000

Abstract

This paper discusses the strategic building blocks of pension reform. The early sections set out the simple economics of pensions and discuss a series of myths which have proved remarkably persistent. Subsequent sections draw together the conclusions for policy design from earlier theoretical discussion, set out the prerequisites which any pension reform must respect, and discuss the range of choices facing policymakers. The main conclusions are threefold: the key variable is effective government; from an economic perspective the difference between PAYG and funding is second order; and the range of potential choice over pension design is wide.

JEL Classification Numbers: G23, H11, H40, H55, J14

Keywords: Pensions; funding; Pay-As-You-Go; demographic change

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[1] This paper was written during my time as Visiting Scholar in FAD. I am grateful for help from Dierdre Shanley, the FAD Librarian, and for very helpful comments from Emanuele Baldacci, Robin Brooks, Ke-young Chu, Peter Heller, Richard Hemming, George Kopits, Vito Tanzi, and participants at two seminars at the IMF. I am also grateful for comments from people outside the IMF, including Phil Agulnik, Gary Burtless, Peter Diamond, Howard Glennerster, Robert Holzmann, David Lindeman, Pierre Pestieau, Michal Rutkowski, Stanford Ross, Alan Thompson, and Lawrence Thompson. Responsibility for the views expressed and remaining errors is mine alone.

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Over 20 years ago, in a paper called "Myths My Grandpa Taught Me" (Barr, 1979), I addressed a particular myth—that funded schemes are less vulnerable to demographic pressures than Pay-As-You-Go schemes.[3] Over the intervening years—not least because of the ageing of the population throughout the OECD (see Disney, 2000)—a clamorous debate has grown about pension reform in general, and the necessity/desirability/urgency or otherwise of a move towards private, funded pensions, in particular.

In the context of such debate, now is a useful time for a return visit to that earlier myth and for reflective discussion of other, newer ones, in an attempt to shed light rather than produce heat. Section I sets out the simple economics of pensions. Section II discusses a series of myths which continue to have widespread currency—among policymakers, if not among experts. The building blocks of reform are discussed in two parts. Section III draws together the conclusions for policy design of earlier theoretical discussion, and puts forward a series of prerequisites with which *any* pension scheme should conform. The existence of such prerequisites does not, however, mean that the choices facing policy makers are limited. The large range of choice is set out in Section IV.

Discussion is organized in this way not only for logical but also for operational reasons. When advising governments it is helpful to distinguish those areas where advisers can legitimately thump the table (e.g., in asserting that public pension spending must be compatible with economic growth) from those where they should tread carefully to avoid usurping the rights of sovereign states. These two very different aspects of advice are the subject matter of Sections III and IV, respectively. A central conclusion is that—provided the prerequisites are respected—the range of choice in pension design is considerable.

Discussion is deliberately limited in a number of ways. Throughout, I concentrate on the *economic* aspects of pension design. With no intention of downplaying the importance of political economy, the purpose of this paper is to clarify the economic analytics. Second, the paper makes no attempt to assess the probabilities of different outcomes (e.g., the likelihood that government failure will affect PAYG schemes relative to that of financial market turbulence affecting private schemes). The intention is to offer a checklist of issues which policymakers should decide in the context of each country. Third, the discussion of pension arrangements in different countries is not intended as a survey, nor as a formal comparison but, more narrowly, to illuminate the analytical discussion with practical examples.

[3] A funded scheme pays pensions out of a fund built over a period of years from the contributions of its members. Pay-As-You-Go (PAYG) schemes pay pensions out of current contributions or taxes.

I. The Simple Economics of Pensions

This section establishes three recurring themes: the centrality of output to the macroeconomic viability of pensions; the pervasive uncertainties and (separately) the pervasive risks faced by pension schemes; and problems of imperfect consumer information.

A. The Centrality of Output

The economics of pension schemes can be confusing because it tends to focus on financial aspects such as analysis of portfolios of financial assets. I shall try to simplify matters by concentrating on the essential economic issues, that is the production and consumption of goods and services.

There are two (and only two) ways of seeking security in old age (Barr, 1998, Chapter 9). It is possible, first, to *store current production* by storing part of current output for future use. Though this is the only way Robinson Crusoe could guarantee consumption in retirement, the method in practice has major inefficiencies: it is costly; it does not deal with uncertainty, for example, about how one's tastes or constraints might change; and it cannot be applied to services deriving from human capital, medical services being a particularly important example. With few exceptions, organizing pensions by storing current production on a large scale is therefore a non-starter.[4]

The alternative is for individuals to exchange current production for a *claim on future production*. There are two broad ways in which I might do this: by saving part of my wages each week I could build up a pile of *money* which I would exchange for goods produced by younger people after my retirement; or I could obtain a *promise*—from my children, or from government—that I would be given goods produced by others after my retirement. The two most common ways of organizing pensions broadly parallel these two sorts of claim on future output. Funded schemes, where pensions are paid from a fund built over a period of years from the contributions of their members, are based on accumulations of financial assets; Pay-As-You-Go (PAYG) schemes, where pensions are paid (usually by the state) out of current tax revenues, are based on promises.

Given the deficiencies of storing current production, the *only* way forward is though claims on future production. What matters, therefore is the level of output after I have retired. The point is central: pensioners are not interested in money (i.e., colored bits of paper with portraits of national heroes on them), but in consumption—food, clothing, heating, medical services, seats at football matches, and so on. Money is irrelevant unless the production is there for pensioners to buy.

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[4] An exception is owner-occupation, which is a way of storing housing services.

B. Risk and Uncertainty

Risk and uncertainty facing pension schemes. It is important to distinguish risk and uncertainty. With risk, the probability distribution of potential outcomes is known or estimable, with uncertainty it is not. The distinction is critical, among other reasons, because actuarial insurance can generally cope with risk but not with uncertainty. Pension schemes face both uncertainty and risk—the future is an uncertain business, and no pension scheme can give certainty. Uncertainties are of at least three sorts.

(a) Macroeconomic shocks can have adverse effects on output, prices or on both. Since funding and PAYG are merely different ways of organising claims on future output, it should not be surprising, as discussed in Section II.A, that a fall in output has adverse effects on any pension scheme. On the other hand, purely inflationary shocks adversely affect funded schemes more than PAYG schemes.

(b) Demographic shocks, it will turn out, also affect all pension schemes.

(c) Political risks affect all pension schemes because, as discussed below (Section II.J), all pension systems are dependent—albeit in different ways—on effective government.

All pension schemes face these common shocks. Private funded schemes face further risks.

(d) Management risk can arise through incompetence or fraud, which imperfectly-informed consumers (Section I.C) generally cannot monitor effectively.

(e) Investment risk: pension accumulations held in the stock market are vulnerable to stock market fluctuations. At its extreme, if a person is required to retire on his or her sixty-fifth birthday, there is a lottery element in the value of his/her pension accumulation.

(f) Annuities market risk: for a given pension accumulation, the value of an annuity depends on remaining life expectancy and on the rate of return the insurance company can expect over those years. Both variables face not only risk but also significant uncertainties.

Risks facing individual pensioners. Given these uncertainties and risks, discussed in more detail in Section II.G, a separate question is how they are shared. With individual funded accounts (also called *defined contribution* schemes), the contribution rate is fixed, so that a person's pension is an annuity whose size, given life expectancy and the rate of interest, is determined *only* by the size of her lifetime pension accumulation. Insurance protects the individual against the risks associated with longevity but leaves her facing all the uncertainties ((a)–(c), above)) and risks ((d)–(f)) associated with varying real rates of return to pension assets.

Under a *defined benefit* scheme, often run at a firm or industry level, the firm pays an annuity based on the employee's wage and upon length of service. A key design feature is the way wages enter the benefit formula. In older schemes, pension was often based on a person's wage in his/her final year (or final few years) of work, a typical formula being one-eightieth of final salary per year of service. That arrangement, however, has distortionary effects on wages and labor mobility. The trend has therefore been to base benefits on a person's real wages averaged over an extended period. Whichever way wages are calculated, a person's annuity is, in effect, wage indexed until retirement. The employee contribution is generally a fraction of his/her salary, so that the employer's contribution becomes the endogenous variable. Thus in a defined-benefit scheme, the risk of varying rates of return to pension assets falls on the employer, and hence on some combination of the industry's current workers (through effects on wage rates), its shareholders and the taxpayer (through effects on profits), its customers (through effects on prices) and/or its past or future workers, if the company uses surpluses from some periods to boost pensions in others.[5]

With *social insurance*, exemplified by state-run PAYG schemes, risk is shared yet more broadly. The costs of adverse outcomes can be borne by the pensioner through lower pensions, by contributors through higher contributions, by the taxpayer, through tax-funded subsidies, and/or by future taxpayers through subsidies financed by government borrowing.

C. Imperfect Consumer Information

The advantages of consumer sovereignty rest critically on the assumption that the individual is well-informed or, at a minimum, is better-informed than the central planner. Imperfect information creates problems for pensions generally and private pensions in particular. Individuals are imperfectly informed, first, because of *uncertainty* in the face of the common shocks just discussed. In this context, individuals are not well-informed about the future because nobody, including government, is well-informed.

Individuals are imperfectly informed, second, in the face of *risk*, for example, about longevity. This need not be a major problem for market solutions so long as the relevant risks can be covered by actuarial insurance.

A third type of imperfect information applies particularly to defined-contribution schemes. Private pensions are complex, based on an array of financial institutions and financial instruments. Two sorts of imperfect information can usefully be distinguished.

Ignorance which can be reduced by public education. Even in the OECD countries, many people are ignorant about financial markets. A report by one of the largest U.K. banks pointed out that 'lack of investment growth is a significant risk even if the fund is secure. However, there is little evidence that this basic truth has been understood. The concept of

[5] For detailed comparison of defined benefit and defined contribution schemes, see Bodie and others (1988).

risk remains foreign to most people [in Britain], or understood only in the context of the risk of theft or fraud' (National Westminster Bank, 1997, page 19).

According to a recent British government Green Paper on pension reform, 'Few people really understand pensions. Few know about their own pension provision and the action they need to take to improve it' (U.K. Department of Social Security, 1998, page 27). Alongside the efficiency issues raised by consumer ignorance, there is also a distributional point, that those who are least well-informed are disproportionately the least well-off.

There is widespread consumer ignorance even in the United States, arguably the country with the greatest public knowledge of, and interest in, financial markets. Orszag and Stiglitz (2000) quote the Chairman of the U.S. Securities and Exchange Commission as stating that over 50 percent of Americans did not know the difference between a bond and an equity.

Ignorance which is largely inherent. Even financial sophisticates cannot necessarily be regarded as well-informed consumers.

> '[M]ost current personal pensions are difficult products for people to understand. People find it hard to know whether a pension offers them a good deal and are unable to make easy comparisons between them. There are complex charging structures, with ... quite different effects depending on how long the pension is held for ....
>
> '[I]ndividuals have limited power in the pension market. Personal pensions are complex. Individual consumers have no real power to negotiate with pension providers. Shopping around effectively is difficult. When they join, they have no influence on the terms of their contract and no power to press for improvements after they have joined' (U.K. Department of Social Security, 1998, page 51).

Given the high potential cost of mistaken choice, imperfect information creates an efficiency justification for stringent regulation of pensions to protect consumers in an area where they are insufficiently well-informed to protect themselves. Recent scandals in the United Kingdom (see U.K. Pension Law Review Committee, 1993; U.K. Treasury Select Committee, 1998) illustrate the need for tightening regulation even in industrial countries.

II. Misleading Guides to Policy

Like many myths, those discussed below may have an element of truth. That element, however, is often just enough to give a semblance of plausibility but, on closer inspection, is sufficiently tenuous to be a misleading guide to policy. Some readers may regard these myths as caricatures which nobody takes seriously. In response, I have come across all of them in recent policy debate, often in a context where the restrictive surrounding assumptions are not well understood, with a significant potential for unsound policy conclusions. The following discussion examines three sets of myths (see also Orszag and Stiglitz, 2000) concerning the macroeconomics of pensions (Sections II.A–II.E), pension design (Sections II F–II I), and the role of government (Section II.J).

A. Myth 1: Funding Resolves Adverse Demographics

"Some degree of pre-funding is desirable in an old age security system. This helps to insulate the system from demographic shock" (James, 2000, page 1).

Consider a balanced PAYG scheme, where:

$$sWE = PR \qquad (1)$$

where s = the PAYG social security contribution rate, W = the average nominal wage, E = the number of workers, P = the average nominal pension, and R = the number of pensioners. In such a scheme, current contributions of the workforce exactly cover current pension payments.

To show the effects of adverse demographics, suppose that a large generation of people of working age in period 1 is followed by a smaller generation in period 2—broadly what is happening in most OECD and transition countries. As a result, the smaller period 2 workforce has to support the large generation of retired period 1 workers. It is helpful to consider separately the cases of static output and growing output.

Static output. Suppose that, because of a decline in the birth rate, E halves. Other things being equal, a PAYG scheme can remain in balance in various ways. One option is to halve the average pension, P, imposing the entire cost of the demographic shock on pensioners. This is problematical because it breaks the promise made to pensioners and because of its potential equity effects, including pensioner poverty. Another option is to double the contribution rate, s, thus imposing the entire cost on workers. This is problematical because of its potential adverse incentive effects on work effort. Other options are discussed shortly.

It is sometimes argued that funded schemes get round this problem: period 1 workers build up pension savings; the savings of a representative worker exactly cover his pension stream (i.e., the present value of his pension stream exactly equals the lump sum he has accumulated by the time he retires); if there is a large number of period 1 workers, this is not a problem, it is argued, because each worker accumulates enough to pay for his/her own pension.
The problem with this argument is that though it is true in nominal terms, it is false in real terms, as demonstrated in Barr (1979). To see why, note that the underlying problem caused by demographic change is a fall in output. This affects a PAYG system by shrinking the contributions base, WE, correspondingly reducing the pensions bill which can be supported by a given contributions rate. With funding the mechanism is more subtle, but equally inescapable, operating through a mismatch between demand and supply in either the goods market or the assets market. The mechanism merits explanation. Discussion starts with a closed economy; subsequent extension to a global economy does not change the result.

If a large generation of workers is followed by a smaller generation, there will be a large accumulation of pension funds belonging to the older generation at a time when the

workforce is declining. The large older generation will seek to draw down its accumulated savings to finance its desired level of consumption in retirement. That desired level of spending will exceed the desired pension contributions of the smaller younger generation. If output does not rise, the resulting disequilibrium manifests itself in either of two ways.

(a) Suppose that pensioners seek power over future production by building up piles of money, for example, government bonds. In that case, desired pensioner consumption exceeds desired saving by workers. Excess demand in the good market causes price inflation, reducing the purchasing power of pensioners' annuities.

(b) Suppose, instead, that pensioners seek power over future production by accumulating nonmoney assets, for example, equities. In that case, pensioners' desired asset sales exceed desired asset purchases by workers.Excess supply in the assets market reduces asset prices, reducing pension accumulations and hence the resulting annuity.[6]

Under either outcome, pensioners do not get the real pension they expect. Funded pensions face similar problems to PAYG schemes, and for exactly the same reason—a shortage of output. The only difference is that with funding the process is less transparent and, for that reason, is perhaps preferable to politicians, who prefer bad news be seen to arise through market outcomes rather than political decision.

Growing output. Returning to equation (1), with static output the problems of PAYG could be resolved by halving P, by doubling the contribution rate, s, or by a combination of the two. An alternative solution arises where output, and hence the average wage, W, doubles, but P remains constant. Though this implies a fall in the replacement rate, P/W, pensioners —crucially—get the real pension they were promised. In that case, equation (1) holds, and the PAYG scheme remains in balance without the need for either a reduction in pensions or an increase in contributions.

Equally, increased output is a complete solution for funded schemes. Cases (a) and (b), above, now play out as follows.

(a) Goods market: a decline in the savings rate at full employment increases aggregate demand; but if aggregate supply has increased sufficiently, there is no excess demand for goods and hence no inflation. As with the PAYG case, though P/W falls, pensioners get the real pension they expect.

(b) Assets market: higher output generally implies that workers will have higher wages; if period 2 workers want a pension of (say) 50 percent of their previous wage, their

[6] Heller (1998) also makes this point. A simulation exercise by Brooks (2000) based on a stochastic overlapping generations model with stocks and bonds shows the general equilibrium effects on asset returns of demographic change, showing in detail how this result emerges.

demand for assets to hold in their pension accumulation will increase in proportion with their wages. At its simplest, E halves but W doubles, so that the demand for assets equals desired sales by pensioners. Hence there is no deflation of asset prices. Again, period 2 pensioners get the real pension they expect.

Policies in the face of demographic change. Thus the central question—and the reason for the earlier emphasis on output—is how to encourage growth, and the part which funding does (or does not) play in bringing this about. In principle, output can be increased in two ways. One approach is to increase the productivity of each worker, thus increasing W in equation (1). Policies to this end include (a) more and better capital equipment, for example, robots, and (b) improving labor through more education and training. A second approach is to increase the number of workers from each age cohort, thus increasing E in equation (1). Such policies include (c) policies to increase labor supply, for example, by married women by offering better child care facilities, (d) raising the age of retirement, (e) importing labor directly, for example, through more relaxed immigration rules,[7] and (f) importing labor indirectly by exporting capital to countries with a young labor force.

What impact does funding have on these policies? It clearly has no bearing on policies (b)–(e). The evidence on the effect of funding on capital accumulation via policy (a) is controversial, a topic taken up in more detail in Section II.C. The effect of funding on (f) requires discussion. The emphasis on output is because what matters to pensioners is consumption, not money. However, pensioners are not restricted to consumption of domestically-produced goods, but can consume goods made abroad so long as they can organize a claim on those goods. It does not help British pensioners to build piles of pound notes if there are no British workers producing anything. However, if British workers use some of their savings to buy Australian factories, they can in retirement sell their share of the factory's output for Australian money to buy Australian goods, which they then import to the United Kingdom. This is an example of policy (f).

This approach can be effective, but is no panacea. The policy breaks down if Australian workers all emigrate to California; in that case Australian factories remain idle, and so both U.K. pounds and Australian dollars are useless. Thus, the age structure of the population in the destination of foreign investment is important. Second, if large numbers of British pensioners exchange Australian dollars for other currencies, the Australian exchange rate might fall, reducing the real value of the pension. Thus the ideal country in which to invest has a young population *and* products one is likely to want to buy. Accumulating assets in countries with younger populations can thus be a useful way to maintain claims on future output. Overseas investment by pension funds is one way to implement this policy. But there are other ways of doing so: I could, for example, hold part of my saving in Australian equities or mutual funds. Funding per se is not paramount—what is paramount is saving.

[7] Though this would have to be phased carefully to prevent another demographic crunch in 30–40 years time.

The conclusion to which this leads is threefold.

- In the face of demographic problems the key variable is output;
- Policy should consider the entire menu of policies which promote output growth directly;
- From a macroeconomic perspective the choice between PAYG and funding is secondary.

In sum, the argument that funding insulates pensioners from demographic change should not be overstated. The policy implication is that from an economic point of view demographic change is not a strong argument for a shift towards funding.

B. Myth 2: The Only Way to Pre-Fund is Through Pension Accumulations

Since the effects of demographic change are, in broad, terms, predictable a long way in advance, it is desirable to have a long-term planning horizon. It is argued that moving towards funded pensions is exactly such a move. It is not, however, the only one.

Cutting future spending. One way to pay for pensions in the future is to find fiscal headroom to do so. Returning to equation (1), we have already seen that one way to maintain the average pension in the face of demographic change is by increasing the PAYG contribution, s. The argument against this approach is its potential adverse incentive effects. However, it is not public pension spending which matters for incentive purposes, but *total* public spending, which determines the total rate of tax,

$$t = s + v \qquad (2)$$

where v is the rate of tax required to finance spending other than pensions.

An increase in s is feasible provided that it is offset by a fall in v, that is, so long as any increase in pension and other age-related spending is counterbalanced by reduced public spending in other areas. One way to do this is to start to repay public debt now. As a result, in 2025, when the demographic 'blip' is at its worst, public pension spending will be higher and debt servicing expenditure lower, making it possible to maintain the real value of the PAYG pension without an increase in overall taxes. The title to consumption formerly represented by the stream of interest payments is now transferred to pensioners. On one interpretation, this is an example of consumption smoothing by government.

Setting aside resources to meet increased future demands. An alternative approach is to pre-fund in ways other than pensions. For example, Norway top slices its oil revenues, using the proceeds to build up a fund one of whose purposes is tax smoothing in the face of demographic change. The United States, similarly, has a trust fund in anticipation of future

pension spending and Canada a similar arrangement. Another example is Singapore's Provident Fund. Unless such actions increase output, however, such mechanisms are a zero-sum game so far as consumption by pensioners and workers is concerned.

Thus, if pre-funding is thought desirable (a defensible view), it does not follow that a move towards private pensions is the only instrument for doing so.

C. Myth 3: There is a Direct Link Between Funding and Growth

It is often regarded as self-evident that saving, and hence economic growth, will be higher with funding than under PAYG. The claim in Feldstein's famous 1973 paper is that the U.S. PAYG social security system reduced personal saving by about 50 percent, thereby reducing the capital stock by 38 percent below what it would have been in the absence of the social security system. The resonances from that article—particularly the argument that PAYG schemes reduce saving rates—continue in policy debate. Part of the case for a proposed move towards individual funded accounts put forward by the British government in March 1997 was that '[t]he economy will be strengthened by a massive increase in long term investment funds' (Secretary of State for Social Security, quoted in the U.K. Department of Social Security, 1997, page 2).

The claim that funding increases savings and hence output growth requires at least three major qualifications (for fuller discussion, see Barr, 1998, Chapter 9; Thompson, 1998; and Mackenzie, Gerson and Cuevas, 1997). First, increases in saving, if any, occur only during the build up of the fund—in steady state, saving by workers is exactly matched by dissaving by pensioners. Second, does funding increase saving even during the build-up phase? The issue can be posed simply. Suppose that my mandatory pension contribution of 100 is moved from a PAYG scheme to a funded scheme. Two illustrative outcomes are interesting:

- My voluntary saving (for retirement or bequests to my children) does not change. Thus savings increase by 100.

- I reduce my voluntary saving by 100; thus there is no increase in saving.

On the face of it, therefore, the issue is the extent to which any increase in mandatory saving is offset by a reduction in voluntary saving. That, however, is only part of the story. In any switch from PAYG to funded accounts a central question is what happens to the pensions of the older generation. If they are reduced, consumption will fall, and hence, ceteris paribus, savings will increase. If pensions are not reduced, they will have to be paid from taxes or debt. Extra taxation will exert downward pressure on saving; extra debt will be an offset, at least partially, to additional private capital formation. Such macroeconomic effects could swamp the behavior of individuals whose pension contributions are moved from a PAYG contribution to an individual funded account.

It is therefore not surprising that there is much controversy, going back to Victorian times, about the effect on saving of a move from PAYG to funded accounts. I make no attempt to

summarize the debate in detail (see Aaron, 1982; Thompson, 1998; Orszag and Stiglitz, 2000). Auerbach et al. (1989) and Auerbach and Kotlikoff (1990) use a 75-period life-cycle general equilibrium model to simulate the effects of demographic change under different pension regimes. The results highlight the key role of expectations (which are largely unmeasurable) on retirement behavior. Gale (1998) argues that the savings offset is larger than previously supposed because of econometric biases in earlier work, suggesting that the effect of funding on total saving is smaller than previously supposed. Holzmann (1997) reaches a similar conclusion. An IMF study (Mackenzie, Gerson, and Cuevas, 1997, page 1) concluded that,

> '[s]tudies of the U.S. economy, on which most research has been done, provide some moderately strong evidence that the introduction and development of the public pension plan have depressed private sector saving, although the extent of this impact has proved hard to estimate. Studies of other countries as a group have tended to be inconclusive .... The upshot is that it is not possible to generalize across countries about the impact of the public pension system on saving'.

Taking the evidence as whole, there is no robust evidence that a switch to funding increases saving in any country except the United States; and the U.S. evidence is controversial.

Even if funding does increase saving, what is the effect on output? There are not one, but three links in the argument that future output will be higher with funding than with PAYG: funding leads to a higher rate of saving than PAYG; that higher saving is translated into more and better investment; and that investment leads to an increase in output. None of the three links *necessarily* holds. The evidence on the first, as just discussed, is mixed. On the second, increased saving does not necessarily lead to new investment: a British trade union once famously invested part of its pension fund in old masters. So far as the third link is concerned, it is important to focus not only on the volume of savings, but also on how those savings are used. The most glaring demonstration that investment does not lead automatically to growth is provided by the latter days of communism, when investment rates were enormously high. '[I]n 1985 only 25 percent of Soviet industrial output was of consumer goods. The remaining 75 percent was of producer goods' (Estrin, 1994, page 64). Even in well-run economies it cannot simply be *assumed* that pension fund managers make more efficient choices than other agents in channelling resources into their most productive use. The U.K. Government Actuary admitted that he was 'not in a position to judge whether . . . pension fund money is more capable than other money of being deployed in accordance with the long-term national interest' (U.K. Government Actuary's Department, 1978, paragraph 25).

The link between savings and growth faces further complications in postcommunist and developing countries: funding contributes to growth only if it increases domestic investment. In transition countries, however, domestic investment may be low yield and high risk, the *exact* reverse of what pension fund managers look for. Thus pensions policy faces a horrible dilemma, discussed further in Section III.B, because domestic investment puts old age security at risk while foreign investment puts growth at risk.

It is also argued that funding contributes indirectly to growth by widening and deepening capital markets. As Diamond (1995) points out, though not an argument which applies to the OECD countries, it is potentially relevant in transition and developing countries. However, the broader context is important: though a larger capital market may be a *component* of growth, it is not *on its own* a solution. As discussed in Section II.J, the key lesson from Chile (to which the capital-market-widening-and-deepening argument is often applied (Holzmann, 1997)) is the effectiveness of reform outside the financial sector.

To summarize a large, complex and controversial literature:

- The magnitude of the impact of funding on growth is controversial. Though there is some empirical evidence that funding contributes to higher savings in the United States, there is no robust evidence of a similar effect elsewhere.

- The issue, in any case, relates only to one of the sources of growth. Hence policies concerned with growth should consider the *entire* menu of policies discussed in Section II.A, and not focus exclusively on pension funds.

- Finally, though growth is important, it has to be remembered that it is not the primary goal. As Mackenzie, Gerson, and Cuevas (1997, page 1) point out, "It can hardly be overemphasized that the basic objective of a public pension program is not to raise the savings rate, but to provide income security—at the very least, a minimum income—for the elderly."

D. Myth 4: Funding Reduces Public Pension Spending

In proposing a radical shift towards defined-contribution funded pensions, the U.K. Secretary of State for Social Security argued that one of the key advantages of the reform was that "... ultimately the taxpayer and the economy will be relieved of the largest single item of public spending—some £40 billion a year" (quoted in the U.K. Department of Social Security, 1997).

Private pensions might make it possible to reduce state pension spending in the longer-term, when the new schemes are mature. However, they are no short-term solution. If workers' contributions go into individual funded accounts they cannot be used to pay the pensions of older people. Unless government refuses to pay the pensions of the older generation, it has to finance them out of taxation and/or through debt. As a result, the need to finance the transition to a new pension regime generally *raises* public pension spending in the short to medium term. In the words of an IMF study:

> "... the fiscal costs of undertaking such a shift [to a fully funded scheme] may be very high, and ... meeting those costs may require, in many cases, an amount of fiscal adjustment that is substantially higher than what would be needed to fix the PAYG system" (Chand and Jaeger, 1996, pages 32–3).

Furthermore, the costs of privatizing a bloated PAYG system are greater than those of privatizing a sustainable scheme. An important conclusion follows: privatization is no solution to fiscal problems. *If the problem is a state scheme which is unsustainable, the only solution is to make it sustainable* by increasing contributions, cutting benefits or a mixture of the two. Thus a move towards funding, whatever its other merits, should not be undertaken for reasons of short-run expenditure constraint.

E. Myth 5: Paying off Debt is Always Good Policy

"The problem with state schemes is that they are pay-as-you-go. Nothing is saved or invested for the future" (U.K. Secretary of State for Social Security, Press conference, 5 March 1997). The argument runs as follows. (a) Members of a PAYG pension scheme have accumulated rights. (b) Those rights are an unfunded liability and hence can be thought of as implicit debt. (c) The scale of that debt is large, so fiscal prudence suggests that it should be reduced. (d) A move towards funding achieves this. The state could require younger workers to join private, funded schemes and would pay the pensions of the older generation through taxation or borrowing. Such expenditure would cease once the older generation had all died; accumulated debt, if any, would be repaid by current and future taxpayers. (e) Hence a move towards funding is desirable because it reduces implicit debt.

In considering the validity of this argument, it is useful to distinguish a series of questions: what is the nature of pension debt; how should PAYG pensions be represented in the public accounts; is paying off debt necessarily desirable; what are the arguments for reducing public spending; and how can public spending be contained in the face of demographic pressures?

What is the nature of pension debt? Any pension scheme has liabilities and assets. With a fully funded scheme, the gross liability is the present value of promised future pension payments and the gross assets the holdings of the pension fund. With a defined-contribution system the present value of the liabilities and assets are by definition equal; thus the net present value of the system is zero. An important feature of the system is that both liabilities and assets are explicit.

Under a PAYG system, the gross liability is the present value of promised future pension payments. However, government can change the terms of the promise so as to reduce liabilities, for example, making the basis of indexation less generous (as in the United Kingdom in 1980), increasing the retirement age, or lengthening the averaging period used to calculate benefits. In sharp contrast, funded schemes, whose liabilities are explicit, have no such let out. The ability of governments to change the rules breaks the equivalence between implicit and explicit liabilities. Specifically, treating implicit liabilities as though they were explicit may overestimate them.

The gross assets of a PAYG system are the government's right to tax current and future generations. As with liabilities, valuation is not formulaic. It might be argued that the right to levy taxes is not an asset comparable to an explicit pension accumulation: the doubt might be a philosophical antipathy to taxation; it might point to the deadweight costs of taxation; or it

might focus on the uncertainty of future revenues. All these factors would tend to reduce the value of the assets. The counterargument is that, provided government is effective, the tax base will generally be as buoyant as financial assets and is likely to be more robust. Provided one accepts that taxable capacity is adequate to meet pension liabilities, as shown by equation (1), the net present value of the scheme is zero.

For these reasons Nuti argues that:

> "A fully-balanced Pay As You Go system, in which current pensions match exactly current contributions ... has zero gross assets; its net present value is negative due to future liabilities to current pensioners and employees, but as long as the system stays balanced this never comes to the surface. That net negative present value is matched, as it were, by a kind of seigniorage that the government obtains from the exclusive right to run a universal and compulsory PAYG pension system. *The 'true' net present value of the PAYG system is zero, in the sense that, if the government wanted to privatise it, transferring its rights and obligations to a private institution enabled to maintain pensions at a level no greater than allowed by current contributions, there would be no need for any public compensation* for the outstanding net negative present value, nor for any recurring future subsidy" (Eatwell and others, 2000, pages 136–7, emphasis added).[8, 9]

In contrast, a PAYG scheme will have a negative net present value if assets fall short of liabilities, that is, if we believe that future governments will not be able to collect taxes sufficient to pay promised pensions. This outcome could arise because government is ineffective (e.g., makes irresponsible promises) or because government is effective but faces adverse demographics. Where a scheme is unsustainable, the *only* solution is to reduce liabilities (where pension promises are too generous), or to increase assets (where the problem is ineffective collection of contributions), or a mix of the two.

How should PAYG pensions be represented in the public accounts? With a balanced PAYG scheme, gross assets (the right to levy taxes) equals gross liabilities; thus the net present value of the scheme should appear in the public accounts as zero. There are two reasons why this might not be so. First, as discussed earlier, people might take different views about the valuation of the right to levy taxes. Second, the scheme might be unsustainable, in the sense that equation (1) does not hold. Under either of these arguments, projected PAYG deficits are a negative item in the public accounts.

Looking at the issue in more detail, consider a benchmark case where the contribution, s in equation (1), is fixed in perpetuity. For a given level of employment, E, and real wage W,

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[8] Note that when Nuti uses the word 'privatise' he is referring to a *PAYG* scheme run by a private entity.

[9] Geanakoplos, Mitchell and Zeldes (1999, p. 80) reach a parallel conclusion: "We prove that in an ongoing social security system, with or without a trust fund, the net present value of transfers to all generations must sum to zero."

contributions are constant, and are shared across the pensioner population, R. Thus the endogenous variable is the average pension, P, and the costs of demographic change fall entirely on pensioners. There are no fiscal worries: if the scheme is sustainable today, it will remain sustainable. As a mental experiment (to use Atkinson's term), such a scheme could be handed over to a private entity without paying any compensation to the private buyer, and thus has a zero net present value.

More realistically, consider the case where the real value of the pension, P, is fixed in perpetuity. In this case, the real pension is constant, hence total pension spending and so also s are endogenous. The costs of demographic change fall on the working generation. It is useful to consider four different cases. (a) No population ageing: this case is equivalent to that in which s is fixed in perpetuity. The net present value of the scheme is zero. (b) Population ageing matched by productivity increases: thus W rises in parallel with R; again s remains constant and the net present value of the scheme is zero, in that it could be handed over to a private entity. (c) Population ageing in excess of productivity increases but within fiscal tolerances: thus s has to increase. If the effect is small and there is fiscal headroom (e.g., the United Kingdom), assets continue to match liabilities; the scheme remains sustainable and—albeit arguably—can appear on the public balance sheet as a zero item. (d) Substantial population ageing with no fiscal headroom: in an arithmetic sense, assets can be increased in line with liabilities by raising the contribution rate in parallel with rising numbers of pensioners. In economic terms, however, the scheme is unsustainable: the assets need to be deflated because the necessary increase in s would have costly adverse incentive effects. Such a scheme clearly has a negative present value.

This line of argument suggests the following conclusions:

- If, in the extreme, we place a zero value on the state's right to tax, gross PAYG pension liability should appear as a negative item in the public accounts.

- Taking tax revenues at face value, the negative entry on the public accounts should relate only to any *increase* in s necessitated by demographic change or by promises of future pension increases unmatched by changes in the wage base. Where s is constant—cases (a) and (b)—the net present value of a PAYG scheme is zero.

- A strict approach would contain a negative item even in respect of sustainable increases in s (case (c), above). A more liberal approach would contain a negative item only for an increase in s which is regarded as unsustainable (leaving to one side the definition of 'unsustainable').

Is paying off debt necessarily desirable? If the net present value of a sustainable PAYG scheme is zero, what is the case for pre-funding? More generally, should all anticipated future needs be pre-funded? I know that I will need to buy food for the rest of my life; but I do not accumulate a food fund, but intend to pay my grocery bills out of future earnings. The reason for making a pension accumulation is a different one—namely that I intend to retire, that is, to stop producing goods which I can exchange for other goods; no such accumulation

is needed in a world without retirement, where people are immortal, or remain healthy and active in the labor force until their death. Such a world is mythical for the individual but is exactly the case for a country, which does not have to take action to anticipate a time when production will cease. The fact that countries are immortal is central: from an economic perspective, it makes pre-funding unnecessary unless it has a positive effect on output, an issue about which, as discussed in Section II.C, the arguments are equivocal.

If pre-funding does not increase output, paying off debt does nothing to change net wealth. Suppose that I have savings of $20,000 and debt of $5,000; my net worth is therefore $15,000. If I repay the debt, my savings fall to $15,000; my net worth remains $15,000. Repaying debt does not change net wealth, but does mean that one has to tighten one's belt. If there is never any need to repay the debt, the gains from repaying it are not obvious. This, as just argued, is the case with a sustainable PAYG scheme.

Thus it can be argued that the case for paying off implicit debt is not as strong as it first appears. In strict economic terms, the case for a move towards funding rests on its impact on output. Second, as discussed earlier, conversion to explicit debt may overstate the size of debt, that is may repay more than is necessary. Third, if the worry is the state's unfunded liabilities, why is the argument applied only to pensions? In all but the poorest countries, health care and education are largely publicly funded. Governments would not willingly renege on promises to care for the sick and to educate the country's children (these promises can be explicit, for example, constitutional guarantees about access to education). Such commitments are implicit debt in the same way as pensions, and their scale is not dissimilar, yet there is no discussion of pre-funding.

This line of reasoning suggests two conclusions. First, what matters is not the gross magnitude of the future liability but its sustainability. Second, the case for minimizing implicit or explicit debt is not strong; here—as elsewhere—the scale of debt should be optimized, not minimized. In those circumstances, what is the case for reducing public pension spending?

What are the arguments for reducing public spending? Generational accounting (see Kotlikoff, 1992; Kotlikoff and Raffelhueschen, 1999; Cardarelli, Sefton, and Kotlikoff, 1998) considers pension spending in the context of public spending generally. Kotlikoff argues that government should promote 'generational equity,' and should therefore seek to equalize tax burdens across generations. This objective is contentious. First, it is a value judgement which, like all value judgements, is disputable. Second, a range of exogenous inequities—wars, natural disasters, major epidemics, the Great Depression, the collapse of Communism—have generation-specific effects; it is by no means clear that equalizing tax burdens is the equitable solution. Third, a definition of equity based on *generations* rather than *individuals* opens an ambiguity; with generations of varying sizes, equal treatment of generations by definition means unequal treatment of individuals, and vice versa.

A very different argument for fiscal sustainability (Barro, 1979) is that smoothing tax rates over time minimizes the welfare loss caused by taxation. This is a straightforward efficiency

argument which does not rely on normative appeals to intergenerational equity. This line of argument does not require the sophisticated generational accounting of the equity argument: what matters is the total size of the tax bill, not the age distribution of taxes and benefits.

How can public spending be contained in the face of demographic pressures? If it is thought desirable to make tax rates more equal over time, how might this be done? From earlier discussion, a move towards private, funded pensions is not the only way to attenuate the impact of demographic change. One approach to improving the fiscal stance is to reduce future spending directly, by reducing the average pension or by raising the age of retirement. Such policies can be defended on the Kotlikoff grounds of intergenerational equity. On the other hand, raising the retirement age needs no such defense: the policy is desirable for its fiscal impact; it is also a sensible response to increased life expectancy, reducing pension spending not by reducing living standards in retirement but through a shorter duration of retirement. This approach levels down public spending, maintaining taxes broadly at existing levels, thus imposing relatively more of the cost of demographic change on pensioners.

A second approach, already discussed, is to reduce future spending on things other than pensions, for example, reducing public debt now so as to reduce interest repayments in the future. This latter approach brings forward spending so that the tax burden is 'leveled-up' to a point between present and projected future levels, thus imposing relatively more of the cost of demographic change on current and future taxpayers.

In conclusion, the argument that implicit pension debt should be minimized is too simple. The relevant variable is not public pension spending but total public spending; and the size and time path of that spending should be optimized, not minimized.

F. Myth 6: Funded Schemes Have Better Labour Market Incentive Effects

A further series of myths relates to the design of pension systems.

> '[T]he core rationale for the multi-pillar recommendation [includes] ... defined contribution to provide good labor market incentives, especially regarding the age of retirement' (James, 2000, page 1).

Simple analytics. Labor market distortions can (a) affect retirement decisions and (b) influence labor market responses earlier in life. So far as the retirement decision is concerned, what matters is that pensions, P in equation (1), should be related *at the margin* to individual contributions, s, and contributors and beneficiaries should perceive this to be so. The argument is important. It is open to policymakers to have a pension formula which is redistributive in the sense that worker A, with twice the earnings of worker B over his working life, gets a pension which is higher than B's, but less than twice as high. However, if either A or B retires early, his pension should be actuarially reduced relative to the pension he would have received at age 65.

Earlier labor market decisions depend not just on the marginal relationship between contributions and benefits, but on the effect of an increase in earnings on the total pensions package. In this latter case, labor market distortions are minimized where contributions bear a fully actuarial relationship to benefits, and are seen to do so. This is the case with private defined-contribution schemes. It is also the case with state schemes which pay benefits which are strictly proportional to a person's contributions record, an example being the Swedish 'notional defined-contribution' scheme, discussed in more detail in Section IV.B. A strong relation between contributions and benefits can have particular benefits in countries with a large gray economy, where incentives can to some extent substitute for enforcement in assisting compliance.

In contrast, badly-designed schemes, whether private or public, can cause labor-market distortions. Gruber and Wise (1999), reporting on a study of 11 industrial countries, find a strong relationship between the design of public pensions and early retirement. In particular, they examine the fact that most countries increase pensions for people who delay retirement by less than the actuarial amount, thereby creating an incentive for people to leave the labor force at the age at which their pension wealth is maximized. Gruber and Wise call this 'the tax force to retire', and find a strong correspondence between that variable and the labor force departure of older men.

Such distortions also exist in private schemes. It is well-known (Campbell, 1999; Burtless and Quinn, 2000) that employer, defined-benefit schemes can create labor immobility, and also give incentives to retire at the time when pension wealth is at a maximum. Note that publicly-organized defined-benefit schemes, being universal, do not impede labor immobility, since members can change jobs without changing to a new pension scheme.

Complexities. The simple case assumes rationality. In consequence, labor supply is independent of debates about PAYG and funding—what matters is the incentive structure of pensions, not the mechanism by which their finance is organized. As an empirical matter, however, reality and perception can diverge: people may perceive a contribution to a private scheme as a contribution (hence causing no distortions), while perceiving contributions to a state pension—even an actuarially organized state scheme—as a tax. The converse, too, could hold, if people have confidence in a state scheme but little or none in private schemes. To the extent that there is a divergence between reality and perceptions, the conclusions of the simple case may not hold.

The simple case also implicitly assumes that pensions are the only labor-market distortion. A general equilibrium analysis would take explicit account of other influences on the labor market, notably the presence of progressive income tax. Such analysis has yet to be conducted, though an early foray by Peter Diamond reported by Orszag and Stiglitz (2000) suggests that the comparison between defined contribution and defined benefit schemes is complex, and with no clear outcome.

Finally, the simple case assumes that all that matters is labor supply. Again, however, it is necessary to keep one's eye on the ball. Analogous to earlier arguments about saving, what

matters is not labor supply but economic welfare. It may be, for example, that a defined-benefit scheme reduces labor supply at the margin; but if the loss of utility resulting from lower output is more than offset by the utility gain resulting from greater security, then defined-benefit arrangements are welfare improving notwithstanding reduced labor supply.

These arguments lead to two main conclusions. First, pension design—whether public or private—can affect labour supply adversely, though the analysis can be complex. Second, labour supply should be seen in the broader context of welfare maximisation.

G. Myth 7: Funded Pensions Diversify Risk

As discussed in Section I.B, pensions face a series of risks and uncertainties. The future is an uncertain business, and no pension scheme can give certainty. In the face of these problems, '[t]he principal advantage of a multipillar pension scheme lies in risk diversification. Not all of the population's retirement portfolio will be held hostage to political and demographic risk' (Holzmann, 2000*a*, page 21). Before discussing whether this is so, it is necessary to discuss in more detail the uncertainties and risks outlined in Section I.B.

The first group of problems, broadly, are related to common shocks.

Macroeconomic shocks. Two cases need to be distinguished: an output shock and a purely inflationary shock. Output shocks affect all pension schemes—with PAYG by shrinking the contributions base (or the rate of growth of the contributions base), with funding by reducing the value of the financial assets on which funds are based. Given the centrality of output discussed in Section I, this conclusion should not be surprising. In contrast, where the shock is inflationary (i.e,. a purely monetary phenomenon), there is little or no effect on PAYG pensions: if prices double, nominal earnings, W in equation (1), will double, and thus also the nominal yield of social security contributions, sWE, making it possible to double nominal pensions, P. In real terms nothing has changed.[10]

There is a sharp contrast with defined-contribution schemes. It is important to distinguish pensions in build-up and pensions in payment. Defined contribution schemes can generally cope with inflation during the build-up of pension rights, and with a given rate of *anticipated* inflation once the pension is in payment. But they do not cope well with unanticipated post-retirement inflation. The reason is simple. At retirement, a pensioner receives an annuity whose present value equals his pension accumulation. For a given remaining life expectancy, the size of the annuity depends on the size of the accumulation and the *real* rate of return facing the seller of the annuity. Two cases need discussion. (a) Certainty: suppose that inflation is 5 percent each year with certainty, it is then an easy matter to offer an annuity which rises in nominal terms by 5 percent each year. Inflation is no problem. (b) Uncertainty:

[10] This simple argument deliberately abstracts from complications such as the fact that inflation erodes pensioner purchasing power continuously, whereas pensions are increased only periodically.

inflation is a common shock and is therefore uninsurable. In addition, since future rates of inflation are unknown, inflation raises issues of uncertainty rather than risk and so—for a completely separate and additional reason—cannot be covered by actuarial insurance.[11] A possible escape route where inflation is purely domestic is to hedge through an internationally diversified portfolio of pension assets. Another escape route, from the insurer's perspective, is to offer limited indexation. If the limit is 5 percent then, so far as the insurer is concerned, the situation is similar to the certainty case, above — the risk of inflation beyond 5 percent is transferred to the pensioner.

The conclusion is that once pensions are in payment, private, funded schemes can cope with limited inflation (i.e., can offer indexation up to some pre-specified level). But they face major problems with inflation beyond that level. The point is much more than academic. The price index in Britain in January 1974 was 100; in September 1978, in the wake of the first oil shock, it was 200. With 5 percent indexation, pensions would have increased from 100 to about 133, rather than to 200. Pensions in payment would have lost one-third of their value. At least three points are noteworthy: private defined-benefit schemes—in contrast with PAYG schemes—are vulnerable to purely monetary phenomena; any loss is permanent—in contrast with pensions during build up, there is no opportunity to make up any of the lost ground; and people are retired today for many more years than previously.

The fact that inflation is an uninsurable risk does not mean that nothing can be done. It is possible to hedge the risk to some extent by holding a diverse range of assets, perhaps including foreign assets. Empirically, however, hedging against unanticipated post-retirement inflation is generally incomplete, expensive or both. A complete solution—particularly in countries with less well-developed financial institutions—is for the state to deal with the inflation element of pensions, for example, by issuing indexed bonds. This introduces an unfunded element into the scheme, alongside any other unfunded elements such as the tax advantages pension funds may enjoy (see Barr, 1992).

Demographic shocks affect PAYG schemes via effects on the contributions base—other things being equal the smaller the generation of workers the smaller the contributions base. With funding, as explained in Section II.A, the shock operates through inflation in the goods market and/or through deflation of the financial assets in pension funds.

Political risks. As discussed in Section II.J, below, all pension systems depend critically on effective government.

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[11] Insurance is efficient only if a number of technical conditions are met (see Barr, 1998, Ch. 5), of which two are relevant in this case: (a) the relevant probabilities have to be independent; and (b) the probability distribution of outcomes has to be known. In the context of pensions, if one member of a pensioner generation experiences inflation, they all do, violating (a); and future inflation rates are unknown even over a 5-year period, let alone the much longer periods relevant to pension schemes, thus violating (b). For both reasons, inflation is an uninsurable risk.

In addition to these uncertainties faced by all pension schemes (indeed, by all economic activity), private pensions face additional risks.

Management risk. The issue of imperfect consumer information was highlighted in Section I.C. If government is ineffective, *any* pension scheme will be at risk. Even with effective government, however, individual pension funds may be badly managed. Management may be honest but incompetent; or it may be deliberately fraudulent. For both reasons, pension funds require substantial regulation to protect consumers.

Investment risk. Even if managed with complete probity and high competence, pension funds face the risk of differential pension portfolio performance. With defined-benefit schemes these risks fall on the industry and hence, as discussed in Section I.B, can be shared broadly across the industry's current workers, shareholders and customers, or spread across past or future generations of its workers.

Under a defined-contribution scheme, two people with identical earnings and contributions records may end up with very different pensions. 'Benefits depend on the returns on assets (which are stochastic and with the right stochastic process in dispute) and on the pricing of annuities (which is also stochastic and also subject to dispute about mortality trends as well as future rates of return)' (Diamond, 2000, page 2). Consider individuals A and B with identical lifetime contributions profiles: if A retires when the stock market index stands at 5000, and B retires six months later when the stock market has fallen to 4000, B's pension will be 20 percent lower than A's. Burtless (2000), comparing the pension received by different cohorts of workers who differ only in respect of the year in which they retire after a 40-year working life, finds substantial variations—for example, a replacement rate of 80 percent for a worker retiring in 1972 had collapsed to just over 40 percent for one retiring in 1974. This outcome may be more than a short-term phenomenon; depending on its duration, a stock-market downturn could adversely affect an entire cohort. Miles (2000), in a simulation of 1 million non-overlapping 30-year return histories, using historical data on European stocks shows that 'some age cohorts would earn very low, and possibly, even negative returns .... These findings on the risk faced by pensioners are at odds with the position taken in much of the literature and suggests that the benefits of funded schemes tend to be overstated' (Royal Economic Society, 2000, page 13).

Up to a point, these risks can be reduced. The average return to pension funds is boosted by keeping costs low, for example, by collecting contributions through payroll deductions and by limiting advertising expenditure. A second approach might be to require funds to be run on fairly simple lines, for example, as tracker funds, rather than actively managed, thus reducing or eliminating the lower tail of pension fund performers. Third, if people are obliged to convert on the day they retire, and if they are obliged to retire on their sixty-fifth birthday, the value of their pension is to a significant extent a lottery. To reduce the resulting inequity, it is therefore essential to allow flexibility over the timing of conversion of a

person's lump sum into an annuity.[12] For all these reasons, government proposals about 'stakeholder pensions' in the United Kingdom are designed explicitly to reduce costs and risk (see U.K. Department of Social Security (1998) and, for a critique, Agulnik and Barr, 2000). This solution, however, is a zero sum game: it does nothing per se to increase output; and at a given level of output, the gain in pensioner consumption from selling their accumulation at the top of the market is at the expense of worker consumption.

Having adopted these various strategies, the remaining investment risk is inherent in the logic of individual funded accounts. The extent of that risk should not be underestimated: the problem is not just the substantial variance of outcomes but, in addition, the fact that the mean outcome is uncertain.

Annuities market risk. Under a defined-contribution scheme, the annuity a person can buy with her lump sum depends on (a) her expected duration of retirement, that is, her remaining life expectancy at the time she retires, and (b) the interest rate the insurance company expects to earn over the lifetime of the annuity, in particular the rate of interest on long-term government bonds. There is significant uncertainty about both variables. On the first, a major health breakthrough could lead to insurance company failures. Separately, the return—even on 'safe' assets like long-term government bonds—varies, so that a person who retires during a recession, with low interest rates, may receive a significantly lower annuity than someone who retires during a period of higher interest rates. In Chile, for example,

> '[t]he collapse of long-term interest rates in the past two years has had a dramatic effect on annuity rates. By way of example, 100,000 units of capital would have secured a life-long annuity of 8,000 per annum in July 1998. For the same 65-year old man, by October 1998, 100,000 units of capital would only have secured an annuity of 5,800 per annum (Callund, 1999, page 532).

A further problem is that in many countries, even advanced industrial countries, the annuities market is thin: with competing insurance companies, each company has only a small share of the market, and hence only a few people in each age group. Thus the opportunity of economies of scale is largely lost and, consequently, transactions costs are high. This reduces the value of an annuity, quite independent of interest rate fluctuations.

Does a multi-pillar system reduce risk? What, then, of the proposition that a multipillar pension scheme diversifies risk? The proposition holds only if those risks are negatively correlated or, at a minimum, are orthogonal to each other. Applying this criterion to the risks above, economic risk and demographic risk, as discussed in Section II.A, are common to both funding and PAYG. Funded schemes, in addition, face management risk, investment risk and annuities market risk. Nevertheless, the variance in wages and real asset returns are not fully correlated (see, e.g., Holzmann, 2000*a*, Annex); equally, political risks (e.g.,

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[12] In the United Kingdom, personal pensions can be converted into an annuity at any age between 50 and 75.

unsustainable PAYG systems) and investment/management risks may be independent. These issues, ultimately, are empirical. Because of citizens' perceptions, funded schemes in some countries at some times in their history might have greater legitimacy; in other countries, however, state PAYG pensioners have been better protected than recipients of private pensions, for example, the United Kingdom in the 1970s (though not today).

These arguments point towards two conclusions. First, the risk-spreading argument is more complex than it first appears, and is not always and automatically right: private pensions may or may not diversify risk; they certainly introduce additional risks. Second, if we *do* accept the argument, we should be clear that it is as much a defense of the state pension as of private pensions.[13] Thus the risk-diversification argument is logically incompatible with the view (World Bank, 1994; James, 1998) that the first pillar should be minimized.

H. Myth 8: Increased Choice is Welfare-Improving

Holders of individual funded accounts, as discussed in Section I.B, face all the uncertainties and risks discussed above. They also face the consumer information problems discussed in Section I.C. Two issues need discussion: the benefits from consumer choice; and the administrative costs associated with the exercise of that choice.

The conventional advantages of competitive market allocation are that it increases consumer choice and minimizes costs. An increase in the range of choice, however, is desirable only where consumers are sufficiently well-informed to make choices, which the discussion of Section I.C calls into question; and if competitive forces push down prices consumers, for the same reason, are unable to assess whether quality is low (e.g., whether a pension fund has poorly-qualified managers), and if so whether they want the lower-quality product at the lower price. The counterargument to the proponents of competitive pension provision is that the advantages of competition are contingent on perfect information (for fuller discussion, see Loewenstein, 1999). The scale of uncertainty, risk and other consumer information problems does not *necessarily* rule out consumer choice as welfare-improving, but should be seen as a counterpoint, most particularly in poorer countries where citizens have little financial market experience.

The cost of allowing choice, in particular administrative costs, is an equally relevant part of the argument. Constrained choice, for example, in a state scheme, opens up the possibility of administrative economies of scale; with little constraint on choice, for example, with individual funded accounts from competing providers, those economies of scale are lost. It may be argued that competitive pressures will act to keep costs down. But, as Orszag and Stiglitz (2000, page 29) remind us, competition "only precludes excess rents; it does not

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[13] Merton (1983) and Merton, Bodie and Marcus (1987) argue that a mixed system, with an unfunded state pension tied to earnings growth and a diversified, funded component tied to stock market performance can reduce risk relative to a fully-funded system.

ensure low costs. Instead, the *structure* of the accounts determines how high the costs are" (emphasis in original).

The issue is important because the power of compound interest (one of the main arguments used in support of funded accounts) applies equally to administrative costs. The U.S. Advisory Council on Social Security estimates that, under plausible assumptions, the *additional* administrative costs of a decentralized system absorb about 20 percent of a pension accumulation over a 40-year career (Orszag, 1999, page 33). Thus it should not be surprising (see, e.g., Diamond, 1998*a*) that Chile and the United Kingdom, both of which rely to a significant extent on individual funded accounts, have high administrative costs.[14]

Additionally, a significant element of administration takes the form of a fixed cost—the cost of maintaining a pension account is related to such variables as the duration of the account and the frequency of deposit, but not to the size of each deposit. Administrative costs thus bear most heavily on small pension accounts, that is, those of low earners. This point may not be overriding in OECD countries but is immensely significant in poorer countries.

The conclusion is that increased individual choice is not always or necessarily welfare-improving.

I. Myth 9: Funding Does Better if Real Returns Exceed Real Wage Growth

We know (Samuelson, 1958; Aaron, 1966) that the rate of return to a mature PAYG scheme is the sum of the population growth rate, n, and real wage growth, w. Suppose that the return on the stock market is i. If

$$i > n + w \qquad (3)$$

(where all variables are net of administrative cost) workers on the face of it do better if they put their contributions into a funded scheme. Put another way, for a given contribution funded schemes provide a higher pension than PAYG.

> "In contrast to the 2.6 percent equilibrium return on Social Security contributions, the real pretax return on ... capital averaged 9.3 percent over the same ... period .... [As a result], forcing individuals to use the unfunded system dramatically increases their cost of buying retirement income" (Feldstein, 1996, page 3).

A straightforward comparison between rates of return, however, does not compare like with like. A full analysis needs to include (a) the costs of the transition from PAYG to funding, (b) the comparative risks of the two systems, and (c) their comparative administrative costs.

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[14] Murthi, Orszag and Orszag (1999) report administrative costs absorbing 40 percent of the value of individual accounts in the United Kingdom. See also Report of the Panel on Privatization of Social Security, 1998.

Financing the transition: the equivalence proposition. The following analytics draw on Orszag (1999), a non-technical summary of an important series of results established by Breyer (1989) (see also Homburg, 1990), which have recently been applied to the U.S. debate (see Geanakoplos, Mitchell, and Zeldes, 1999, and Belan and Pestieau, 1999). The conclusion is that if proper account is taken of the costs of transition from a PAYG to a fully funded scheme there is generally an equivalence between the return to the two schemes.

Case 1: designing a system for a brand new world. The argument that pensioners are better-off under funding if the real return to assets, i, exceeds real wage growth, $g+w$ is, indeed, true in a brand new world, and is therefore potentially relevant to a country (e.g., India) with a small public pension scheme. However, note the important qualification that it is only later generations, who have a full contributions record, who get the higher return, not the first generation, who do not have enough time to build such a record.

In many countries, however, what is being discussed is a move from an existing PAYG scheme towards funding. In that case, it is necessary to include the transition costs of the change, that is, to look at funding not only from the viewpoint of the funded pensioners, but from that of the economy as a whole.

Case 2: constant benefit rules; transition costs financed by public borrowing. To illustrate the argument, consider the simplified example in Table 1, taken from Orszag (1999, Chapter III), with static output and no population growth, in which a generation pays $1 in contributions when young and receives $1 in pension when old. In period 1, the $1 pension of older generation A is paid by the $1 contribution of younger generation B. In period 2, when generation B is old, its pension is paid by the contributions of young generation C.

Table 1. A Simplified Pay-As-You-Go System

	Generation			
Period	A	B	C	D
1	+$1	-$1		
2		+$1	-$1	
3			+$1	-$1
4				+$1

Source: Orszag (1999, page 9)

Assume that the real rate of return on assets, *i*, is 10 percent, and imagine that we are generation C. As members of the PAYG system, we pay \$1 in contribution in period 2 and receive \$1 pension in period 3; the real rate of return is zero. If, in contrast, we sign up for an individual account, we would save \$1 in period 2 and get back \$1.10 in period 3; the real rate of return, it appears, is 10 percent.

The flaw in the argument is that if generation C contributes to individual funded accounts, generation B's pension must be paid from some other source. If that source is government borrowing, and if the interest on that borrowing is paid by the older generation, generation C receives a pension of \$1.10 but has to pay interest of 10 cents on the borrowing which financed generation B's pension. The real return—as under the PAYG scheme—is zero. The lower return on the PAYG system in this case is not the result of some inherent flaw, but precisely the cost of the initial 'gift' to generation A. "[F]alling money's worth in this model is *not* due to the aging of baby boomers, increased life expectancy, or massive administrative inefficiency, but rather to the simple arithmetic of the pay-as-you-go system" (Geanakoplos, Mitchell, and Zeldes, 1999, page 86, emphasis in original).

If, instead, the interest payments are made by the younger generation, generation C does indeed enjoy a 10 percent return. However, generation D receives a zero return: when young it makes \$1 of pension contributions as well as repaying 10 cents interest; in retirement it receives \$1.10 in pension. The higher return to generation C is paid by requiring all future generations to earn a zero real return on a larger base (\$1.10 rather than \$1).

This result is the subject of simulations by Geanakoplos, Mitchell, and Zeldes (1998, 1999) and is demonstrated formally by Breyer (1989) and Belan and Pestieau (1999) (see also Pestieau and Possen, 2000). If the move to a funded scheme is considered not in isolation but alongside the cost of financing the change, there is a precise equivalence between the two schemes—a cost wholly and exclusively the result of the gift to the first generation. If there is a move to individual funded accounts, the higher return to equities is exactly offset by the interest payments on the debt required to pay the pensions of the transition generation; if, in contrast, the system stays PAYG, the present value of the lower return under PAYG over all future generations is equal to the introductory gain of the first generation of pensioners.

As a result, generation C and onwards are not made better-off by a move to individual accounts. As Belan and Pestieau (1999, page 118) put it:

> "privatisation which involves moving from an unfunded to a fully funded scheme is neutral if public borrowing is used to finance the retirement of the transition generation. In other words, a pension privatization that leaves the mandatory contribution rate equal to the payroll tax of the former public system, and that does not alter the terms of eligibility or magnitude of retirement benefits under the old system, will have no impact on the disposable income and wealth of individuals who move from the old system to the new .... In effect, the privatization simply converts an implicit government obligation to future retirees into explicit debt."

Geanakoplos, Mitchell, and Zeldes (1999, pages 139–40) reach exactly the same conclusion for exactly the same reasons.

Case 3: constant benefit rules; transition costs financed by taxation. What happens if we relax the assumption that the transition is financed by public borrowing? Returning to Table 1, suppose once more that we are generation C in period 2. We put our contribution of $1 into an individual funded account, and the $1 pension of generation B is paid out of a budget surplus. As members of generation C we receive a pension of $1.10, a 10 percent real rate of return; generation D, similarly, makes a contribution of $1 and receives a pension of $1.10. The real return is 10 percent because, with tax funding, generation C and its successors do not have the pay interest on additional public debt.

It is critical to note, however, that the identical result could be achieved by injecting some partial pre-funding into the PAYG system. Suppose that in period 2 the $1 of generation C is paid as pension to generation B, and *in addition* $1 is invested in a social security trust fund. Generation C would then receive a pension of $1.10, $1 from PAYG financing, 10 cents from the proceeds of the trust fund; the real return is 10 percent. The same is true for succeeding generations.

The conclusion is that the higher return results not from the move to funded accounts, but *from the injection of an extra $1*. 'Paying back' the gift to the first generation makes it possible to increase the real return to subsequent generations of pensioners. This does not, however, mean that the transition is costless. If output is fixed, an increase in the real return to pension contributions benefits pensioners, who thereby can consume more in old age; but that increase is at the expense of consumption by workers. Thus the move is a zero-sum game, and hence no claims for Pareto improvement are possible.

Case 4: no benefits to the transition generation. Yet another way of financing the transition is to throw generation B out of the lifeboat by not paying their pension at all. That way, it is true, generation C and onwards enjoys a 10 percent real return. But those gains are at the expense of generation B, on whom the entire cost of transition is concentrated. Put another way, the cost of the gift to generation A is offset by the negative gift to generation B.

The fundamental point is that once the gift to the first generation under a PAYG scheme has been made, there is a cost which future generations cannot escape. As Diamond (1998*b*; quoted by Orszag, 1999, page 26) puts it, 'The creation of individual accounts does not change the history that leaves Social Security with unfunded liability'.

Reischauer (1998; quoted in Orszag, 1999, page 15) explains the history:

> "The decision to provide adequate retirement benefits to those who had not contributed to Social Security ... was a fair and sensible one. Many of these workers had fought in World War I and had their careers blighted by the Great Depression. Congress's decision greatly reduced the appalling incidence of poverty among the elderly .... But it also meant that workers' contributions were not building up as reserves that could support them when they

> retired. The result is the so-called unfunded liability .... Whether we retain the existing system or privatize it, this unfunded liability will have to be met unless we renege on the benefits promised to today's elderly and near elderly. Dealing with the unfunded liability inescapably will reduce the returns workers can expect from their contributions."

Thus there is a zero-sum game between the first generation and subsequent generations. The burden of the gift to the first generation can be placed entirely on the transition generation of pensioners (generation B) by reneging on PAYG promises; or entirely on the generation of workers at the time of transition (generation C) by financing generation B's pension out of taxation; or by spreading the burden over succeeding generations by financing the transition through public borrowing. It is possible to alter the time path of the burden, but not its total. Again, the only way out of the impasse is if a move towards funding leads causally to higher rates of growth,[15] an issue on which, as discussed in Section II.C, controversy continues.

Risk. The costs of financing the transition is one element in the comparison between PAYG and funding. A second element is risk, considered in detail by Geanakoplos, Mitchell and Zeldes (1999). As discussed in Section II.G all pensions face macroeconomic, demographic and political shocks. Holders of individual accounts, in addition, face management risk, investment risk and annuities risk. PAYG pensions avoid the latter group of risks; and well-run schemes, by offering fully indexed pensions, also give protection against inflation. This is not the place for detailed discussion of the treatment of risk. All that needs to be said is that the real return both to PAYG and to funded schemes needs to be adjusted downwards to account for risk. In countries with effective government, the volatility of the tax base is less than that of the stock market and, to that extent, even at face value the gain from a switch to individual accounts is less than it appears.

Administrative costs. Finally, the comparison between PAYG and individual accounts has to consider any differential in administrative costs. As already discussed (Section II.H), the evidence that the administrative costs of individual accounts are higher—often considerably higher—than PAYG schemes is well-established.

Thus it is possible that a full comparison—depending on country and circumstance—might show that a move to individual accounts might leave generation C and onwards with a *lower* level of welfare than staying with PAYG. The conclusion is *not* that a move to individual funds is necessary a bad policy, merely that the desirability of such a move cannot be established by a simple comparison of rates of return.

Atkinson (1999, page 8) points out that critics of the welfare state tend to consider its cost without taking account of its benefits.

> "The emphasis by economists on the negative economic effects of the welfare state can be attributed to the theoretical framework adopted ..., which remains rooted in a model of

[15] Holzmann (1999) makes just such an argument.

> perfectly competitive and perfectly clearing markets.... [This] framework incorporates none of the contingencies for which the welfare state exists ... The whole purpose of welfare state provision is missing from the theoretical model."

The point here is precisely similar: that the benefits from a move to funding should not be considered in isolation but alongside the relevant costs. This is a point of which economists, of all people, should need no reminder.

J. Myth 10: Private Pensions Get Government Out of The Pensions Business

A final myth concerns the role of government, whose importance is now recognized by the 'Washington consensus.'

> "I argue that the failures of the reforms in Russia and most of the former Soviet Union are not just due to sound policies being poorly implemented. I argue that the failures go deeper, to a misunderstanding of the foundations of a market economy .... For instance, reform models based on conventional neoclassical economics are likely to under-estimate the importance of informational problems, including those arising from the problems of corporate governance; of social and organizational capital; and of the institutional and legal infrastructure required to make an effective market economy" (Stiglitz, 1999, Abstract).

> "Capitalism is revealed to require much more than private property; it functions because of the widespread acceptance and enforcement in an economy of fundamental rules and safeguards that make the outcomes of exchange secure, predictable, and of reasonably widespread benefit. Where such rules and safeguards, such institutions, are absent, what suffers is not just fairness and equity, but firm performance as well ...." (Nellis, 1999, page 16).

Effective government is essential whichever approach to pensions is adopted. The problem of government failure is most obvious in the case of PAYG schemes built on fiscally irresponsible promises, coupled with an inability to collect contributions. Results include inflationary pressures and political instability. However, private pensions are also vulnerable. Fiscal imprudence leads to inflation which can decapitalize private funds; and inability to regulate financial markets creates inequity, and may also squander the efficiency gains which private pensions are intended to engender. As Thompson (1998, page 22) puts it,

> "It is ... too early to know how effectively the new systems based on the defined contribution model will be insulated from irresponsible behavior. Politicians are not the only people who are prone to promise more than they can deliver. The defined contribution model requires sophisticated oversight and regulation to ensure that one set of problems resulting from public sector political dynamics is not ... traded for a different set of problems derived from the dynamics of private sector operations."

In contrast, effective government is essential for state and private schemes. Governments throughout the OECD are implementing cost containing measures in the face of demographic prospects (see U.K. Department of Social Security 1993). Recent reform in Canada and

Sweden and earlier reform the United Kingdom are prime examples. Government capacity, similarly, is essential for effective private schemes. As Diamond (1995) points out,

> "One advantage of investment in private assets is the potential contribution to the development of capital markets. This was a major benefit from the Chilean reform. But the capital market development did not come automatically from the introduction of the privately managed mandatory savings scheme. Extensive development of capital market regulation was a critical part of the privatization" (page 94).

Two other issues should be considered in this context. It is sometimes argued that funded schemes are safer from government depredations than PAYG pensions. This is not necessarily the case. Governments can, indeed, break their PAYG promises; but equally they can reduce the real return to pension funds, either by requiring fund managers to hold government financial assets with a lower yield than they could earn on the stock market or by withdrawing or reducing any tax privileges the fund might have (the U.K. budget of July 1997 is an example of the latter).

A separate argument considers the role of government if things go wrong. It is argued, for example, that political pressure on government to repair ravages to a state scheme will be stronger than those to put right adverse outcomes in private schemes. Where there is an explicit government guarantee (as in Chile) this argument is obviously false. Though ultimately the matter is empirical, the argument might fail more broadly: the larger the share of the population with private pensions, and the greater the fraction of pension income deriving from private sources, the greater the pressure on government in the face of disaster. Just as PAYG is argued to represent implicit debt, so can it be argued that mandatory private pensions have a strong implicit state guarantee.[16]

Effective government is therefore critical for two strategic reasons: to ensure macroeconomic stability, which underpins well-run PAYG schemes, and which is necessary to protect pension accumulations that are sensitive to unanticipated inflation; and to ensure regulatory capacity in financial markets for reasons of consumer protection.

The key lesson from countries like Chile, which have adopted radical pension reform, is that successful reform rests on two legs—private sector capacity *and* government capacity. There is an inescapable role for the state in pensions even if one distrusts politicians.

III. Pension Design: Essentials

In discussing pension reform, it is useful to distinguish those factors which apply to *all* reforms, over which policy makers have little choice (discussed in this section) from those

[16] Heller (1998) distinguishes contingent and conjectural liabilities.

features over which policy makers have explicitly to make choices (discussed in Section IV). This section draws out the conclusions for policy design which emerge from the theoretical discussion of Sections I and II, and then turns to core prerequisites for effective implementation of pension reform.

A. Policy Design: Lessons From Economic Theory

The analysis in Sections I and II suggests a number of conclusions.

The central variable is future output. As discussed in Section I.A, the possibilities for storing current output until old age are limited. Thus the only way to organize pensions on a large scale is through claims on future output. PAYG and funding are simply different ways of organizing such claims. Two implications follow. First, it should not be surprising that they fare similarly in the face of output shocks. Second, since future output is uncertain, all pension schemes, however organized, face uncertainty.

There is a large range of policies to increase output. As discussed in section II.A, policies to increase output include those which increase the productivity of each worker, and those which increase the number of workers from each cohort. Policies of the first sort include (a) more and better capital equipment and (b) increasing the quality of labor through investment in their human capital. Policies of the second sort include (c) policies to increase labor supply (better child care facilities, tax policies which do not militate against part-time employment), (d) raising the age of retirement, (e) importing labor directly, and (f) importing labor indirectly by exporting capital to countries with a young population.

A range of policies can contain fiscal pressures. The fiscal stance can be improved, first, by reducing future spending by reducing the average pension, the number of pensioners, or both. Excessive reliance on reducing average pensions may aggravate pensioner poverty and/or create political pressures. A more desirable line of attack is to reduce the number of pensioners by raising the age of retirement, a policy which, it can be argued, is desirable in both fiscal and social policy terms. This approach aims to keep taxation broadly at its present level, at a price of imposing the burden of adjustment on pensioners.

A second approach notes that what matters for incentive purposes is not public pension spending but total public spending. Higher pension spending is possible if fiscal headroom can be increased by reducing other spending. One example (Section II.E) is to reduce public debt now, thus reducing interest repayments in the future. This policy levels up taxation to a point between present levels and those which would apply in future in the absence of any policy change. The cost of change is thus spread across generations of taxpayers.

A third way to contain future taxation is to set aside resources now to meet projected pension spending. Examples noted earlier include building up a surplus on the state PAYG scheme, as in the United States and Canada, or, as in Norway, creating a separate fund. The three approaches can, of course, be combined, for example, paying off some debt to allow some fiscal smoothing, and raising the retirement age to share some of the burden with pensioners.

Demographic change creates problems but, from an economic perspective, not insoluble ones. It follows from the previous paragraphs that there is a large range of policies to contain demographic pressures. These include (a) increasing output, (b) reducing the average pension, (c) increasing the retirement age, (d) taking steps now to reduce future non-pension spending, thus creating fiscal headroom to allow increased contributions without any increase in the overall tax burden, and (e) setting aside resources now to meet future needs.

The debate over PAYG and funding concentrates on a very narrow part of the pensions picture. Three points are noteworthy: from a macroeconomic perspective the choice between PAYG and funding is secondary; the connection between funding and growth is controversial; and the issue, in any case, relates only to one of the sources of growth.

Pensions should be designed with labor supply incentives very much in mind. In contrast with the controversy over the incentive effects of pensions on saving and growth (Section II.C), the evidence on labor-market incentives is strong. Badly-designed schemes—whether public or private, funded or PAYG—can create strong adverse incentives, both during working life and in respect of the age of retirement. Pensions should be designed to avoid such incentives, both through good design and through policies to ensure that perceptions (e.g., of an actuarial relationship between contributions and benefits) accord with reality. Given demographic prospects, pensions should offer encouragement to later retirement.

B. Implementation: Prerequisites for Reform

This section sets out the prerequisites for effective pension schemes. The key elements are summarized in Table 2.

Public-sector prerequisites

Fiscal sustainability of the state scheme. State pension promises have to be fiscally sustainable in both the medium- and long run. The reason for the emphasis on sustainability is that a central goal of policy is to increase living standards. Whatever the debates about the effects of taxation on growth, there is no dispute that beyond a certain point the deleterious effects of high taxation are devastating as manifested, for example, by the growth experience of the transition countries during the latter days of communism. Thus public spending, and within that public pension spending, must be compatible with economic growth.

The emphasis on containing pension spending is *not* intended as an attack on pensioners. Nor is it a statement that state pension spending in the long-run should necessarily be minimized (as opposed to optimized). The World Bank's 1996 *World Development Report* (Chapter 7) correctly talks about 'rightsizing' government, and makes it clear that economies can function well with governments of different sizes—but only within fiscally sustainable limits.

Table 2. Prerequisites for Pension Reform

	Essential for state scheme	Essential for private schemes
Public sector prerequisites		
Fiscal sustainability of state scheme	✓	
Political sustainability of pension reform package	✓	✓
Administrative capacity to enforce taxes/contributions	✓	✓
Capacity to maintain macroeconomic stability	✓	✓
Effective regulatory capacity		✓
Private sector prerequisites		
Sufficiently well-informed population		✓
Financial assets		✓
Financial markets		✓
Adequate private sector capacity		✓

Political sustainability has several essential ingredients. It is necessary, first, that there is sufficient strength of political will to carry through the reform process. Thus domestic ownership of reform is important, an aspect in which, it can be argued, the 1998 Polish reforms are on firmer foundations than those in Hungary (see Nelson, 1998 for discussion of the politics of reform in Hungary). The second ingredient is the duration of political support. Pension reform—whether large-scale reform of the state scheme or the introduction of private pensions—is not an event but a process. Reform does not end when the legislation is passed, but needs continuing commitment from government, both for technical reasons, to ensure necessary adjustments to reform proposals as events unfold, and for political reasons, to sustain continuing political support. Reform which is regarded as a single, once-and-for-all event runs the risk of neglect, discredit and eventual reversal. A third element is the depth of political support. It is not enough for the top echelons of government to understand the reform proposal. The idea and its implications must be shared and understood throughout government *and* administration. Without that depth of shared understanding, the original plan risks being implemented badly or, at worst, actively subverted by lower levels of government or administration.

The achievement of fiscal and political sustainability requires government capacity of the following three sorts:

Administrative capacity to collect taxes and enforce contributions. Public pensions require government to be able to collect contributions; private schemes require government to have the capacity to enforce contributions. A country which cannot implement even a simple payroll tax cannot run a pension scheme. The issue then becomes one of how to organize poverty relief in a context of limited fiscal and administrative capacity, a topic with

a huge, and entirely separate, literature (see Barr, forthcoming, for discussion in the context of transition countries and, for broader discussion, Ravallion, 1996).

The capacity to maintain macroeconomic stability is necessary both generally, to foster economic growth, as well as for long-run stability of PAYG finance. It is also of fundamental importance for private pensions, which are sensitive to unanticipated inflation.

Effective regulatory capacity. Effective regulation of financial markets is vital for private pensions, to protect consumers in areas too complex for them to protect themselves. This requires tightly drawn up regulatory procedures *and* a body of people with the capacity and will to enforce those procedures. This latter task is more difficult than it looks: precisely because pensions are such complex instruments, regulators need to be highly skilled—the sort of skills with a high price in the private sector. There are at least three problems: that the regulatory regime collapses (or is ineffective); where that problem is avoided, that the regulatory regime becomes *de facto* state control, with the pension provider acting, in effect, as an agent of the state; or, where that problem is avoided, that the management and regulation of pension funds crowds out other demands for scarce human capital.

These public-sector prerequisites are relevant, for the most part, both to state and private pensions. Private pensions have additional private-sector prerequisites.

Private-sector prerequisites

Adequate public understanding of and trust in private financial instruments. A number of points, though obvious, need to be stressed. First, private pensions require that both government and citizens are well-informed about the operation of financial markets. In some less-advanced reforming countries there is still a belief, even at high levels in government, that if a fund is 'private' and the money 'invested', a high real rate of return is inevitable, with no understanding either of the nature of the risk, or of the connection between financial variables and real variables such as national output and employment levels. Nor should this be regarded as a patronizing remark about poorer countries. The discussion in Section I.C made clear the depth of ignorance about financial-market institutions even in countries like the United Kingdom and United States.

Alongside knowledge about private financial instruments is a separate issue of public trust. Specifically, does the public trust the private sector at least as much as it trusts government? For example, in Kazakhstan, many people stayed in the government accumulation fund.[17]

[17] The pressure to move out of the government fund is considerable. A draft law in mid-2000 proposed that there should be no state fund, and that people would not be allowed to take a job until they had chosen their private fund.

Financial assets and financial markets. Equally obviously, private schemes require financial assets for pension funds to hold and financial markets for channeling savings into their most productive use. One apparent solution is a blind alley. If pension funds hold only government bonds, this appears to address the lack of other financial assets. However, the resulting schemes are, in effect PAYG, since both the interest payments and subsequent redemption depend on future taxpayers. Thus there is no budgetary gain, no channeling of resources into productive investment, and considerable extra administrative cost. It is sometimes argued that schemes based on government debt will encourage development of private financial assets, that is, that supply will create its own demand. This may, indeed, have happened in some countries. However, the root of private financial assets is progress in the private *real* economy (competitive markets, effective corporate governance, effective regulation, and the like). Though the market for public debt can be a useful benchmark market for the private sector, the logical priority of developments in the real economy is ignored at policy makers' peril.

Another apparent solution is to use the pension savings of a poorer country to buy western financial assets. Bulgarian savings would go into (say) German firms, or Bolivian savings into U.S. firms, thus getting round the absence of domestic financial assets and financial markets. The obvious argument against this approach is that it foregoes the growth of domestic investment and domestic employment which is part of the argument used in favor of private pensions. To get round this problem, it is argued (e.g., by Kotlikoff and Seeger, 2000) that poor countries should buy low-risk western assets, offset by an inflow of western capital better able to accommodate high-risk investments. In evaluating this argument (see also Holzmann, 2000*b*), it is necessary to consider four aspects: the source of such funds, their volume, their composition, and their duration.

Kotlikoff and Seeger (2000) argue that the World Bank could "[use] its lending power to provide capital inflows that offset any short-term capital outflows." However, international financial institutions offer loan capital not equity participation; thus a major stock market crash would not exonerate Bulgaria or Bolivia from repaying the loans which financed their purchases of foreign assets. The argument thus amounts to a poor country borrowing from the World Bank to finance the purchase of western financial assets, rather than for domestic investment. This seems curious, to put it no more strongly. An alternative source of capital inflows are western firms (e.g., Volkswagen in Skoda) or western venture capitalists. Further questions then follow.

Would western capital inflows be large enough to offset capital outflows? The evidence, not surprisingly, is that inflows are determined by real, not monetary, factors. The countries with the largest per capita foreign direct investment are those that are doing best, for example, Hungary and Poland. Western capital flows are dictated by expected profit not by the unmet needs of a poor country's pension system. At best, the two are unrelated; more likely, they are inversely related.

Will western capital inflows support industries with long-term growth potential? It is an oversimplification to consider investment only in aggregate terms; its composition in terms

of static and dynamic efficiency is, if anything, even more important. A poor country's desired investment mix will be determined by a medium-term growth strategy, including essential physical infrastructure (roads, telecoms) and essential institutions (a tax system, legal structures). Western capital does not necessarily support such ventures; indeed, the historic *raison d'etre* of the World Bank has been to provide loans for such activities precisely because private capital was not forthcoming in sufficient quantity on sufficiently good terms. Separately, western capital would not contribute to the financing needs of small and medium-sized enterprises, from which most growth emerges.

Equally, the investment needs of a poor country have a medium- to long-term time horizon. Western capital is likely to have a short- to medium-term horizon.

None of this rules out the 'investment swap' approach. Certainly, if a country meets the prerequisites for private, funded pensions there is much to be said for at least partial international diversification of pension assets. But the microeconomic arguments call seriously into question the contention that a country needs virtually no domestic financial assets or financial markets. The prerequisites of financial assets and financial markets really *are* prerequisites.

Private-sector capacity is essential, given the heavy administrative demands of private pensions. There are two sets of questions. First, is private-sector capacity adequate? A lack of capacity runs the risk that excessive administrative costs will erode the investment return to pensioners. Since there is a fixed cost to running an individual account, the issue is of particular concern for small pensions. At worst, deficient administrative capacity puts at risk the viability of private funds. Second, even if private-sector capacity is adequate, is its deployment in administering private pensions its most welfare-enhancing use?

Transparency

Transparency is important both for political reasons, to ensure the legitimacy and hence political sustainability of reform, and for economic reasons, as a necessary ingredient if pensions are to steer savings into their most productive use (see International Monetary Fund, 1998). Transparency is needed in state pensions about their cost to the taxpayer and about the relation between contributions and benefits. Private pensions require transparency about the costs of tax relief, and through annual statements giving details of a person's pension accumulation, predicted pension, and administrative charges. For this purpose it is essential that annual statements have a common format, and are based on common definitions of rates of return, inflation, etc. Such transparency is essential to ensure that the claims of competitors are directly and precisely comparable. Chile sets a good example to more advanced countries, by requiring information to pensioners to be issued in a standard way; the U.K. government intends to introduce standardized annual statements from 2001.[18]

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[18] Hidden charges for private pensions have been a besetting problem in the United Kingdom. As an example of what is needed, credit card companies in Western countries are all required to use the same definition in their

(continued...)

Table 2 summarizes the essential prerequisites, and serves as a check-list for policymakers contemplating pension reform and a guide to commentators assessing actual or proposed reforms. In meeting these prerequisites, advanced transition countries like Poland and Hungary have the capacity for the sort of sophisticated reforms they are proposing.[19] It was precisely because of the demonstrable failure to meet several of the prerequisites that in 1998 the World Bank—courageously but completely correctly—withdrew its support for proposals to bring in mandatory second-tier private pensions in Russia. Reference to the same criteria calls seriously into question the strategic direction of reform in Kazakhstan which has introduced private, funded pensions based largely on government bonds.

IV. Pension Design: Policy Choices

A. Building Blocks

A widely-publicized study (World Bank, 1994) 'recommended a multipillar pension system—optimally consisting of a mandatory, publicly managed, unfunded pillar and a mandatory but privately managed funded pillar, as well as supplemental, voluntary, private funded schemes .... [W]e still conclude that the multipillar approach to pension reform is the correct one' (Holzmann, 2000*a*, pages 12–13).

Taking a step back, the objectives of pension systems, it can be argued, are threefold: poverty relief, consumption smoothing, and insurance (the last in respect, for example, of the longevity risk). Rational policy design starts by agreeing objectives and then proceeds to discussion of instruments for achieving them. The World Bank analysis, from this perspective, can be criticized because its categorization focuses on instruments rather than objectives, and thus presupposes the choice, and to some extent also the mix, of instruments.

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promotional literature of the interest rate they charge customers, making it easy for people to see who is offering the best rate. In contrast, the price structures of airlines and telephone companies are not comparable.

[19] Progress in Poland has been rapid. In January 1990, I was faced with a radical pension privatisation proposal at a time when the monthly inflation rate was 80 percent and when—since there were no financial markets—there was no financial market regulation, thus violating two essential pre-requisites. At the time I wrote (World Bank, 1993, paragraph 277): "[T]he need to restructure the state pension scheme [in Poland] is urgent, and clear-cut recommendations for immediate action are [discussed in] Chapter 11 .... Private pensions, in contrast, raise major issues which require detailed study beyond the remit of this report; moreover, the time scale for phasing in private pensions is longer term. For both reasons, this chapter seeks only to set out some of the central issues. Up to a point it indicates potential problem areas. The reason is not to discourage the development of appropriately designed complementary private schemes, but to counter excessive optimism in at least some quarters in Poland about how much can be achieved, and how soon .... The general thrust of the recommendations is that, over the medium term, the system of pensions should evolve into a system with three elements: a basic, state-run social insurance pension; a mandatory system of appropriately regulated complementary private pensions; and a system of voluntary private pensions. The balance between the three elements should be a matter for public debate." By 1998 the time for reform was right.

The following discussion categorises pensions in terms of objectives in order to avoid such presupposition.

- The first-tier pension is intended primarily to provide poverty relief. It is mandatory. Though normally publicly organised and PAYG, its form can vary widely.

- The second tier provides consumption smoothing; it can in principle be publicly or privately managed; it can be funded or PAYG; and it may or may not be integrated into the first tier.

- The third tier is private, funded and voluntary, intended to increase the range of individual choice.

This categorization uses the word 'tier' rather than 'pillar' for two reasons. It is linguistically more apt: pillars can only be effective if they are all in place and all, broadly, of the same size; tiers, more appropriately in this case, are additive, in whatever constellation one wishes. Second, the word 'multipillar' has become identified with a particular form of pension reform; my preference is for a more neutral term.

The following questions about pension design far from exhaust the list.

How large should the first tier pension be? A central question is whether the first tier should be a guarantee, available only (or mainly) to those who need it, or as a base on which other pension income builds. In ascending order, the first tier could take the form of a state guarantee to individuals in private schemes, as in Chile, whereby only the least-well off receive any state pension. Or the state pension could be awarded on the basis of an affluence test (i.e., withdrawn from the best-off), an example being Australia.[20] Somewhat less stringently, the first-tier pension could be flat-rate (hence going to all pensioners): it could be flat-rate below the poverty line (many poorer countries), equal to the poverty line (broadly the case in the United Kingdom), or above the poverty line (New Zealand). Whatever the design of the first-tier pension, a minimum income in old age can be guaranteed through tax-funded social assistance for those whose income from all other sources leaves them in poverty (most OECD countries).

How redistributive should the first tier be? There is less redistribution the smaller the pension and the greater the proportionality between contribution and benefit. Pensions strictly proportional to contributions bring about no redistribution between rich and poor except to the extent that the rich may live longer than the poor. Such proportionality can be

[20] Suppose that there are three income groups, poor, middle-income, and rich. The purpose of an income test is to ensure that only the poor get benefits; thus benefits are clawed back rapidly as a person's income rises. The purpose of an affluence test is different—to keep benefits out of the hands of the rich; thus benefits are clawed back less rapidly so that both poor and middle-income people receive benefits.

achieved either through flat-rate pensions financed by flat-rate contributions or where both pension and contributions are proportional to earnings. A flat-rate pension financed by a proportional contribution will be more redistributive and a flat-rate pension financed from progressive general taxation more redistributive still.

Should there be a second-tier pension? The second-tier pension provides consumption smoothing. A libertarian approach argues for mandatory membership only so far as poverty relief is concerned.[21] Such a scheme would comprise mandatory membership of a minimal first-tier pension plus a third-tier (voluntary) private pension. The argument for a mandatory second-tier pension can be couched in a number of familiar ways: as a merit good (i.e., paternalism); because of myopia; because imperfectly-informed younger people will make suboptimal choices from the perspective of lifetime utility maximization; to ensure insurance against unknowable events;[22] or to avoid moral hazard in the presence of a generous first-tier pension.[23] The issue has a significant normative dimension: an individualistic perspective points towards a voluntary third-tier pension, a paternalistic viewpoint towards mandatory consumption smoothing (for fuller discussion, see Agulnik, 2000).

If there is to be *some* compulsory consumption smoothing, a second question is whether compulsion should be applied only to provision up to some ceiling and, if so, what ceiling.

Should a second tier pension be PAYG or funded? In the United States, the first and second-tier pensions are rolled into one, both tiers being run mainly on a PAYG basis. In Canada, a first-tier state pension provides poverty relief and a mandatory, publicly-organized, PAYG second-tier pension provides consumption smoothing. Other countries, including Australia and several in Latin America, have privately-managed, funded, mandatory second-tier pensions. The United Kingdom has a mixed system: the basic state flat-rate pension is mandatory; beyond that it is mandatory to belong either to the state earnings-related pension scheme (which is PAYG), or to an approved occupational scheme (private, funded, frequently defined-benefit), or to contribute to an individual funded account.

Should the second tier be defined-contribution or defined-benefit? The issue here is how broadly should risks be shared. As discussed in Section I.B, individual funded accounts leave the individual facing most of the risk, in particular of differential pension fund performance. The individual may also face the inflation risk, though this can be shared partly or wholly

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[21] Though Libertarians oppose compulsion, it can be justified for the first-tier pension, even in Libertarian terms, because non-insurance imposes an externality. If someone chooses to make no pension provision, the costs of his decision fall on others, either on the taxpayer (if he is bailed out via social assistance) or, if he is not bailed out, on others, such as his family (if they thereby face starvation) or wider society (if he resorts to crime).

[22] This is particularly an argument for social insurance, which can address uncertainty as well as risk.

[23] If there is a minimum guarantee, low-income people will have little incentive to make voluntary provision.

with the taxpayer if the state provides indexation. Occupational schemes (frequently found in the United Kingdom) are often defined-benefit, thus sharing risks more broadly.

Should the second-tier be managed publicly or privately? As just discussed, the second-tier pension is publicly-managed in some countries, for example, the PAYG schemes in the United States and Canada. Singapore's Provident Fund, a form of compulsory saving scheme, is a publicly managed funded scheme. Many other countries, including Australia and Chile, have privately managed second-tier pensions.

Should opting out of state arrangements be allowed? The first-tier pension, which is redistributive, is by definition mandatory. Beyond that, the question is whether people should be allowed to choose whether consumption smoothing should be via a state pension or through private arrangements. In the United Kingdom, people can opt out of the state earnings-related pension and instead join a private scheme. In the United States and Canada, in contrast, membership of the state earnings-related scheme is compulsory. Part of the argument against opting out is that it opens up the possibility of adverse selection; part of the argument in favor is that it allows additional individual choice.

To what extent does the state assist with indexing pensions? Once a person has retired, pensions based on an annuity are vulnerable to unanticipated inflation. A major design question, therefore, is the extent to which government offers pensioners protection against inflation and through what mechanism. To the extent that government does participate, this introduces an unfunded element into funded schemes.

This far from exhausts the list of potential questions. What, for example, should be the tax treatment of contributions to the third-tier: should such savings receive tax concessions; should those concessions be available only for savings for old age, or also for other purposes such as life insurance; and what form should any tax concessions take? This paper abstracts from these questions: a third-tier of some sort exists in all countries, and is therefore included here for logical completeness, but with no pretence at comprehensive treatment.

B. Fitting the Pieces Together

Pension design is controversial. Of the questions asked above, controversy swirls in particular round two sets of issues: should the first-tier, mandatory, state PAYG pension be minimal or substantial; and how should the second tier be organized—in particular should it be mandatory, private, funded and defined-contribution?

The scale of the disagreement is illustrated by the following two quotes.[24]

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[24] For discussion in the context of transition countries, see Barr (1994, Ch. 9; forthcoming) and World Bank (1996, Chapter 4).

> "The first pillar resembles existing public pension plans, but is smaller and focuses on redistribution—providing a social safety net for the old, particularly those whose lifetime income was low .... [T]his pillar is of limited scope."
>
> "The second pillar ... links benefit actuarially to contributions in a defined contribution plan, is fully funded, and is privately and competitively managed."
>
> "A third pillar, voluntary saving and annuities, offers supplemental retirement income for people who want more generous old-age pensions" (James, 1998, page 275).

In contrast, Eatwell and others. (2000, pages 140–41) argue:

> "Clearly there is no "ideal" model for pension reform. [H]owever, the arguments developed earlier indicate the following course as being ... the best approach for a country that has inherited a non-sustainable PAYG system:

- scaling down generosity towards pensioners ...;
- if there is a positive political assessment of the net advantages of a FF [fully funded] system, [this argues for] its introduction ... into individual accounts within the new funded pension scheme ...;
- the promotion of a third pillar of voluntary private savings, preferably with some tax privileges ....

> The end result is a potential three-pillar system, apparently similar to that advocated by the World Bank (1994) .... The third pillar of voluntary savings is, of course, always actually or potentially present ... and cannot be considered as a distinctive feature of any reform. There are, however, very substantial differences between the recommendations listed above and those of the World Bank (1994) in that here:

- The first pillar is strengthened and maintained in its own right and with its own function ...;
- A FF component is introduced not as a technically superior solution but as a primarily political, though entirely respectable, solution ...."

In many ways the potential range of choice is even wider. Even if each of the issues in the previous section is taken as a simple yes/no choice, the eight questions yield 256 possible combinations, the answers to which will depend on economic variables but also on a country's culture and history.

The following thumbnail sketches of pension systems in different countries are intended neither as detailed descriptions nor in any way as a compendious survey, but as illustrations of the wide range of schemes in the OECD and other successful economies.

Chile. Pensions in Chile were privatized in the early 1980s. Employees are required to join an individual private, funded, defined-contribution scheme; workers pay 10 percent of their earnings, plus a commission charge (there is no employer or government contribution). Workers can choose which scheme to join, and can change schemes. Upon retirement, the worker can buy an annuity or make a series of phased withdrawals. The pension is indexed to price inflation, largely (though not wholly) on the basis of government indexed bonds. There is a minimum pension guarantee: where a worker with 20 or more years of contributions has only a low pension, the state will bring it up to the guarantee level: the provision is intended to protect low earners, and also to protect contributors against poor performance by their chosen fund and pensioners against bankruptcy of the company paying their annuity; there are also generous, government-funded, transitional arrangements for workers transferring from the old (PAYG) scheme to the new scheme. In short, the second-tier is a mandatory, privately-managed, individual funded account; there is a residual first tier in the form of a guarantee to recipients of the second-tier pension.

Chile's reforms are widely-discussed (for assessment, see Diamond, 1996; Callund, 1999). They are also controversial. To some, they are a beacon of hope (World Bank, 1994): the reformed system, it is argued, imposed fiscal discipline, promoted savings and widened and deepened capital markets, and hence contributed significantly to high growth rates in Chile over the 1980s; others are more skeptical (Beatty and McGillivray, 1995).

In assessing Chile's reforms, and the extent to which they are or are not transferable to other countries, a number of points are noteworthy. First, because the system is based on defined contributions, the entire risk above the minimum pension is borne by the individual worker. Second, the scheme is individualistic: there is redistribution neither within a generation (i.e., there is no redistribution from rich to poor except through the guaranteed minimum pension), nor between generations (pensions are indexed to prices, not wages, so that pensioners do not share in economic growth occurring after their retirement). Third, there are significant gaps in coverage, both because of noncompliance (i.e., workers legally required to contribute who fail to do so) and because formal employment embraces only about 65 percent of the workforce. Fourth, outcomes are sensitive to compliance rates, and also to real rates of return. On the latter, the average real return to pension savings in Chile over the 1980s was 12.6 percent per year. This is very high, and a key question is whether it is sustainable. Returns were lower during the 1990s. Fifth, outcomes are also sensitive to design features. After contributing for 20 years workers have some rights to draw down their pension accumulation rather than buying an annuity, creating an incentive to do so to the point where the government guarantee comes into play. Finally, the fiscal costs of the transition are high, including (a) the cost of pensions for older people who never transferred to the new system, (b) the cost of the transitional contribution for workers who switched to the new system, (c) the cost of indexed bonds, and (d) any costs associated with the guaranteed minimum pension. The first two costs will eventually decline; the last two will continue in steady state. It is significant that the reform was introduced at a time when the government budget was running a surplus of over 5 percent of GDP, giving room for the up-front costs of transition to the new system. Recent estimates (Arenas de Mesa and Marcel, 1999, page 4) show "a

fiscal imbalance of 6.5 percent of the GDP in the period 1981–98. The available projections indicate that this fiscal pressure is far from receding."

Singapore has a system in which workers and employers contribute to a Central Provident Fund (for details, see Asher, 1999). The Fund is run by the government, and each account attracts an interest rate decided by government (the process being ad hoc and far from transparent). The scheme offers workers consumption smoothing not just for old age, but also for housing and medical expenditures, and thus offers no guarantee of old age security. Like Chile, Singapore thus relies on a defined-contribution second-tier pension: most pension risk is borne by the individual worker, and the scheme is individualistic in that it embodies no redistribution. In sharp contrast with Chile, however, the fund is publicly-managed.

Sweden introduced a 'notional defined-contribution' scheme in 1998 (Sweden: Federation of Social Insurance Offices, 1998) which works as follows. The basic state pension remains PAYG, financed through a social insurance contribution of 18.5 percent of a person's earnings, of which 16 percent goes into the public scheme. Though this year's 16 percent contribution is used to pay this year's benefits, the social insurance authorities open a notional (or virtual) individual account which keeps track of contributions, just as for a 'real' fund. Specifically, each worker's cumulative account attracts a notional interest rate reflecting average income growth. At the time a person retires, she will have accumulated a notional lump sum. The resulting pension is calculated on the basis of the size of the lump sum, combined with expectations about the lifetime of the current cohort of retirees and output growth over the estimated period of retirement. The basic arrangements are adjusted in that there is a safety net pension for people with low lifetime earnings, periods spent caring for children carry pension rights, and there is a ceiling on contributions. The remaining 2.5 percent goes into a funded scheme: the individual can choose to place it in a privately-managed individual account or in a government-managed savings fund. The individual can choose to retire earlier or later, the pension being actuarially adjusted.

The idea of notional defined-contribution pensions is for social insurance pensions to mimic an annuity, in that the pension a person receives (a) bears an explicit relationship to contributions, (b) is based on lifetime contributions and is adjusted for (c) the life expectancy of the cohort and (d) economic developments. Individuals can respond (e) by adjusting their age of retirement. The introduction of element (c) is an important innovation.

Thus Sweden has a defined-contribution scheme with a safety net guarantee, and is therefore a publicly-organized, PAYG analogue of Chile. The first important argument in favor of these arrangement is that they simultaneously give people choice *and* face them with efficient incentives. For example, they assist choice about retirement by allowing people to choose their preferred trade off between *duration* of retirement and *living standards* in retirement, but face them with the actuarial cost of those decisions.[25] Second, the strong

[25] The good feature of the Swedish scheme is that the pension formula takes account of the life expectancy of the cohort. However, the endogenous variable is not the minimum permissible age of retirement but the size of

(continued...)

connection between contributions and benefits, as discussed in Section II.C, may assist labour market efficiency.

These two advantages are common to the Swedish and Chilean approach. The Swedish approach has additional points which, depending on viewpoint, can be regarded as advantages: the scheme avoids the risks specific to private defined-contribution schemes; it is individualistic to the extent that it is defined-contribution, but the various credits (e.g., for caring for young children) introduce a collective element; and, being PAYG, the scheme avoids the transition costs of a move to funded arrangements.

These arguments point to something that is often overlooked—that there is much flexibility *within* PAYG schemes. Many of the problems of state social insurance systems are not inherent in the social insurance mechanism, but are soluble.

Australia is like Chile in the sense that its second-tier pension takes the form of mandatory membership of an individual funded account, but unlike Chile in that it has a much more fully-articulated first tier (the Age Pension). The distinctive features of the latter are (a) that it is paid from general taxation and (b) is subject not to an income test (designed to restrict benefits to the poor), but to an affluence test, which has the more limited purpose of clawing back benefit from the rich.[26] As a result, all but the best-off receive at least some state pension. Since the state pension is financed from taxation and is larger for less well-off Australians, the first-tier is strongly redistributive. The second-tier pension, like that of Chile and Singapore, faces the pensioner with the risk of differential pension portfolio performance and incorporates no significant redistribution.

New Zealand has a relatively generous universal flat-rate pension (New Zealand Superannuation), supplemented by voluntary, funded, defined-contribution pensions. The pension is PAYG, paid from general taxation, and included in a person's taxable income. Pensionable age is currently being increased from 60 to 65. The rate of pension has recently been increased, aiming at a target of 65 percent of average weekly earnings by 2001; once that target has been achieved it is intended that pensions will be indexed to wage growth. There is some discussion of establishing a government-operated fund partially to pre-fund future pension spending. Interestingly, in a referendum in September 1997 a proposal to replace the tax-financed flat-rate pension with mandatory membership of private, individual funded accounts (i.e., a Chile-type system) was heavily defeated. Eighty percent of the eligible voters took part, with 92 percent of voters rejecting the proposal.

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the pension. In a world of rationality and perfect information this would not be a problem; but if people have a personal discount rate higher than the discount rate used for actuarial adjustment of the pension, they will continue to retire as soon as possible, with progressively larger actuarial adjustments. In the limit, this pulls everyone down to the minimum pension. I am grateful to Lawrence Thompson for this point.

[26] For details, see Australia, Commonwealth Department of Family and Community Services, 1998, Table 1.

The United Kingdom has a low flat-rate PAYG state pension. Under a 1980 reform, the pension was indexed to prices rather than wages, and has therefore fallen steadily as a percentage of average earnings. Someone whose only income is the basic state pension is eligible for income-tested social assistance, that is, the state pension is below the poverty line. Superimposed on the basic pension is mandatory membership of a second-tier pension. In fulfillment of the latter requirement, individuals can choose whether to join the state earnings-related pension, an occupational (usually defined benefit) pension, or an individual, defined-contribution pension. Reform proposals are assessed by Agulnik and Barr (2000).

The United States has an earnings-related PAYG state scheme which is generous relative to a minimalist view, though not in comparison with a number of European countries. The scheme is redistributive: individual A, with twice the earnings of individual B, receives a pension which is larger than B's, but less than twice as large.[27] Though it is possible to retire earlier, full pension is paid when a person retires aged 65, rising gradually to 67.[28] Many people also belong to a company or industry pension scheme and/or to an individual defined-contribution pension, such membership being voluntary so far as government is concerned. The U.S. state scheme thus embraces both first- and second-tier pensions. Private schemes form a voluntary third tier.

V. Conclusion

This paper distinguishes three sets of factors:

- Those things (Section II) which, for analytical reasons, we should assert only with considerable caution.
- Those things which we can—and should—assert authoritatively, notably the principles of pension design set out in Section III.
- Those areas, discussed in Section IV, where—subject to the principles in Section III—there is room for considerable differences in the way countries organise their pension systems.

The following conclusions emerge.

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[27] The pensions formula is applied to a person's indexed monthly earnings averaged over the 35 years with the highest earnings (call this W). In 2000, the formula is as follows:

$W <$ \$531:	$0.9W$
\$531 $< W \leq$ \$3202:	$0.9(\$531) + 0.32(W - \$531)$
\$3202 $< W <$ \$6050:	$0.9(\$531) + 0.32(\$3202 - \$531) + 0.15(W - \$3202)$
$W \leq$ \$6050:	$0.9(\$531) + 0.32(\$3202 - \$531) + 0.15(\$6050 - \$3202)$

[28] If someone retires aged 62 with a full contributions record, her pension is 80 percent of what it would be if she delayed retirement till age 65.

The key variable is effective government, which is a prerequisite for well-run pensions, however they are organized (Ross, 2000, reaches a similar conclusion). It is not possible to get government out of the pensions business.

From an *economic* perspective, the difference between PAYG and funding is second order. There may be important political-economy differences, depending on country and historical context (for a political economy analysis of PAYG schemes, see Cooley and Soares, 1999). It is argued, for example, that the political economy of raising the retirement age may be easier with a private scheme. In contrast, it can be argued that a state scheme which combines poverty relief and consumption smoothing, by embracing middle-class voters, will retain electoral support. Whatever the political arguments, the gains in terms of economic welfare of one pension arrangement as opposed to another is equivocal. Since PAYG and funding, as discussed in Section I.A, are simply different financial mechanisms for organizing claims on future output, this should not be surprising.

A given set of objectives can be achieved in different ways—there are many ways of skinning a cat. Thus there is no one–to–one relationship between instruments and objectives. Consider a scheme whose objectives include mandatory consumption smoothing with some redistribution and risk pooling. The United States achieves this through a mandatory, publicly-organized PAYG pension embracing both poverty relief and consumption smoothing, and with the redistributive formula described earlier. The United Kingdom achieves a broadly similar objective for a significant fraction of pensioners through a combination of a flat-rate PAYG state pension broadly equal to the poverty line, together with privately-organized, funded, defined-benefit occupational pensions. The pattern of replacement rates at different income levels is not, of course, identical in the two countries, but the pattern of retirement income has significant similarity.

Alternatively, consider a scheme whose objectives include actuarial, mandatory consumption smoothing with a safety net provision. The aim in this case is to have a fairly strict separation of consumption smoothing and poverty relief. In such a scheme, redistribution occurs only through the poverty-relief component. Chile pursues this package of objectives through competitive, privately-managed individual funded accounts, with a residual government guarantee. Sweden achieves broadly similar objectives through a publicly organized PAYG notional defined-contribution scheme together with a safety net provision. The Swedish scheme introduces an element of solidarity in that years spent looking after children are counted as contribution years but, beyond that, is in major respects a public-sector analogue of arrangements in Chile.

The range of potential choice over pension design is wide. The key message of Section IV is not merely that one size does *not* fit all—which was always a foolish proposition—but that, provided government is effective, there is a considerable range of choice.

- The state pension should be *optimized*, not *minimized*. It can be smaller, as in Chile, where it takes the form of a minimum guarantee, or the United Kingdom, where it is

close to the poverty line, or larger, as in the United States. It can be income-tested (Chile), affluence-tested (Australia), flat-rate (New Zealand), partially earnings-related (United States) or fully earnings-related (Sweden). In poorer countries, fiscal constraints point to a relatively small state pension; as countries become richer their range of choice increases.

- Consumption smoothing can be organised through a state PAYG scheme (Sweden), a state-organised funded scheme (Singapore), a mixture of state PAYG and private, funded schemes (the United Kingdom or the United States) or almost entirely by private institutions (Chile, Australia). Such pensions can be occupational, defined-benefit (frequently in the United Kingdom) or individual defined-contribution (Australia). In developing economies, capital markets tend to be less well-developed, the capacity to regulate weaker, and the population less well-informed; with economic and institutional development, the range of choice widens.

That wide range of choice, however, does not mean that countries can pick and mix at will.

- Countries with mature PAYG systems which face population ageing should adopt the range of policies discussed in Section III.A which address the problems of PAYG finance. The core policies (a) increase output and (b) reduce the generosity of PAYG pensions, for example, by raising the retirement age. Prefunding could be one element in the policy mix.

- Countries with large, unsustainable PAYG systems have very little choice: the only solution is to make the PAYG system sustainable, by reducing benefits, by increasing contributions or by a mix of the two. Since privatising a PAYG scheme is more expensive when it is bloated, making the scheme sustainable is essential whether or not policymakers wish aggressively to pursue a move towards private, funded arrangements.

- Countries with very limited institutional capacity also have little choice. There is a significant element of progression: in the poorest, administratively weakest countries, the issue is how to organise poverty relief; as taxable capacity increases the next step might be a tax-financed citizen's pension; growing public administrative capacity makes it possible to implement a contributory system; with rising income and growing private administrative capacity, private pensions become an option.

- A country with a small public system and relatively solid public and private administrative capacity has the greatest potential choice. Provided it meets the prerequisites discussed in Section III.B there is a genuine choice of balance between PAYG and funded arrangements. This paper has argued that from an *economic* point of view there is no dominant policy. That being the case, the best choice for a country is that which accords best with the political economy of effective reform. This, in turn, will depend on country specifics.

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