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Public versus Private Provision of Pensions

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Abstract

Pension systems rest on three pillars: (1) redistribution, (2) forced savings, and (3) voluntary savings. There is consensus that the first pillar is best provided through the State, the third largely through private markets. In contrast there is no consensus regarding the second pillar. The author reviews this debate. He concludes that private, individual accounts are attractive primarily because they insure that all savers receive potentially equal returns. But existing public systems can be reformed to achieve a similar equitable treatment of contributors while retaining low administrative costs and providing social insurance that is either expensive or unavailable in private markets.

JEL Classification H55

The three pillars of a pension system

For some years now, the World Bank (1994) has advocated a mixed approach to the problem of old age security, recommending pension systems that rest on three distinct pillars. The first pillar is noncontributory; it guarantees a minimum income to all elderly in society with the aim of alleviating poverty. Pillar 2 receives mandatory contributions from all workers, and promises the largest benefits to those who contribute the most. Pillar 3 is also contributory, but voluntary, for those who would like to supplement the retirement income provided by the first two pillars.

Pillars 1 and 3, for the most part, are not controversial. The consensus is that the redistributive pillar 1 is best left to government, which is in a good position to finance flat, indexed pensions on a pay-as-you-go basis from general revenue. There is also consensus that pillar 3 is best administered by private institutions, with public involvement limited to regulation of financial institutions.

Pillar 2 in contrast is very controversial. An extreme liberal might argue that there is no justification at all for such a pillar, that government has no business mandating savings to insure that retirees have incomes that place them well above the poverty level. With the exception of Milton Friedman (1999), few economists defend this position 1/, at least not in print, so debate has centred on the form government intervention might take rather than on whether government intervention is justified in the first instance. Analysts almost always assume that, unless they are forced to save, workers will consume too much of their income during their working years, save too little for retirement, and live to regret it.

A recent OECD survey (1998, pp. 56-59) of seven European countries plus Japan challenges this assumption. The OECD compares the income of households where the head is aged 67 with the income of households where the head is aged 55. There is surprisingly little variation in this ratio across countries for income from all sources (earnings, capital, pensions and public transfers). In each country the total income of people aged 67 is about 80% of the total income of people aged 55. But there is large variation in the ratio of public transfers received by 67 year-olds to total income of 55 year-olds, ranging from less than 30% in Italy and the United Kingdom to 70% in Sweden. Most people in the countries studied are retired by age 67 whereas most are still working at age 55, so the study concludes that “households in many OECD countries set targets for income just after retirement that are about 80 per cent of income just before retiring.” (pp. 56-57) Faced with a reduced public pension, “people simply make other arrangements such as increasing private pension contributions, saving more or working longer.” (pp. 58-59)

The OECD findings are provocative, and no doubt will stimulate further research, but the strong conclusion that public pensions crowd out all other retirement income is not warranted. The fact is that most of those surveyed have little choice regarding contributions to private pension funds; this is required as a condition for ‘opting out’ of public pension systems. Moreover, voluntary contributions to pension funds are affected by tax incentives, so differences in taxation of pension savings should be controlled in any attempt to measure the effect of public pensions on private saving. Governments that provide smaller public pensions may offer greater incentives for contributions to private pensions. Finally, private pensions are rarely indexed so, unlike public pensions, they tend to erode in value over time. It would be interesting to repeat the OECD study for older cohorts, say age 72, 77 and 82 in addition to 67. My suspicion is that the ratio of retirement income to pre-retirement income falls as the age of the retiree increases, and that it falls faster the weaker the public pension system.

Reform of the second pillar

Much of the debate surrounding reform of the second pillar is couched in ideological terms, with privatizers favouring anything that reduces the role of the State and defenders of public pensions emphasizing social 'solidarity' and the transfer of income from one social group to another. In this paper, following Bodie (1990) I look instead at pensions from the view of the individual contributor. I evaluate the forced saving of pillar 2 in terms of its contribution to income security in retirement rather than its contribution to any particular social agenda. After all, the contributions to this pillar are related to income, as are the pensions, so participants who are relatively poor while working will continue to be relatively poor while retired.

In most developed economies, and in many developing economies as well, pillar 2 today is a public, defined-benefit plan financed on a pay-as-you-go basis from payroll taxes. A defined-benefit pension is one in which benefits are based on the number of years of contributions and an average of lifetime earnings or, more commonly, an average of the retiree's last few years of earnings. This is in contrast to a defined-contribution scheme, in which each participant receives, upon retirement, a benefit equal to the sum of his or her contributions plus investment return. Pay-as-you-go strictly means the absence of any fund: contributions from today's workers finance the pensions of today's retirees. In practice, there is often partial funding when contributions exceed benefits, or the plan may yield deficits that are financed from general tax revenue.

The traditional design of pillar 2 has come under attack from numerous reformers, including the World Bank (1994). These reformers want more than privatisation of public pension schemes; they call for a switch from defined benefit to defined contribution and from pay-as-you-go to full funding. In fact, many feel that privatisation of pillar 2 in itself, with no other changes, would not be very useful.

Nonetheless, other reforms of pillar 2 are possible. Any of three basic pension systems could conceivably replace the traditional defined-benefit, pay-as-you-go scheme, as can be easily seen with the aid of a 2x2 diagram:

	unfunded	**funded**
defined benefit:	Traditional pay-as-you-go	traditional occupational or employer plan
defined contribution:	notional accounts	World Bank (1994)

The traditional pillar 2 is unfunded/defined benefit. The World Bank promotes a shift to funded/defined contribution, but two other reforms are possible: funded/defined benefit and unfunded/defined contribution.

Employers and trade unions have traditionally favoured defined-benefit plans, and have funded these private plans in accordance with actuarial projections of future investment income and future retirement needs. Projections are uncertain, so there is always a risk that a fund may prove inadequate to finance promised benefits, but this risk is borne largely by the employer or trade union rather than individual workers. For participants, defined-benefit plans are appealing because they promise benefits that do not vary with fluctuations in financial markets.

Unfunded, defined-contribution plans are less common, but Sweden has recently begun to move toward such a system, based on notional accounts. In the Swedish system, each worker has an individual account that is credited with his or her contributions plus interest, and converted, on the eve of retirement, into an indexed annuity. But the system remains pay-as-you-go, for current revenue is used to pay current pensions. Italy and Latvia are implementing similar reforms.

A shift to defined contribution is intended to strengthen the link between contributions and benefits. In a typical defined-benefit plan, whether private or public, funded or not, returns on contributions differ from participant to participant within the same cohort. Income is re-distributed, for example, from workers with a flat earnings profile to those with a steep profile (the result of rapid promotion), and from dual-income to single-income families, the result of 'free' benefits for a

dependent spouse. Any desired redistribution may be retained in a defined-contribution system. The new Swedish system, for example, continues to credit workers for years of university, years of child care and years of unemployment, but general government revenues finance these credits so that the retirement income of other workers is not affected.

A shift to funding is more difficult to justify than a shift to defined contribution, at least for public pensions. Private pensions are almost always funded, for two reasons. First, private companies can go bankrupt, so a separate fund can protect pensioners from other creditors in this event. Second, there are often tax advantages for funding. Indeed, tax incentives frequently cause firms to overfund pensions. But governments do not pay taxes and governments do not go bankrupt, so these are not arguments for funding *public* pensions (Hemming 1998).

Funding benefits society as a whole only if national saving increases, permitting the economy to grow, making it easier to support retirees in the future. Those on both sides of the funding debate now recognize that full funding in itself will not necessarily increase national saving. Estelle James, lead economist for the World Bank's 1994 study, states this with exceptional clarity in a recent article:

When a country with an existing pay-as-you-go system replaces it with a multipillar system, national saving increases if benefits are cut or taxes are increased .... [P]utting part of the contribution into the worker's own mandatory saving account may be more politically acceptable and less economically distortionary than increasing saving through high taxes that go into the general treasury. (James 1998, p. 289)

In short, national saving increases because of fiscal austerity and not because pensions are funded. Pension reform encourages saving only to the extent that this facilitates fiscal austerity.2/

Without privatisation, the funded, defined-contribution system is a provident fund, and this is not the model that reformers have in mind! Reformers are adamant that individual accounts must be privately managed. Why? Essentially because they do not believe that the public sector will competently invest workers' savings. To quote E. James (1998, p. 276) once again: "publicly managed pension reserves typically earn low, even negative, returns, largely because public managers are required to invest in government securities or loans to failing state enterprises ...."

This argument, though appealing, should not be pushed too far. Both public and private pension systems require good government and good management to be successful. If the public sector cannot competently run a pension scheme, it will most likely also fail to regulate and supervise private pensions in a competent manner (Vittas, 1993, p. 2).

Risks that affect retirement income

Workers who contribute to any pension scheme, be it public or private, expect in return to receive an income in retirement. This expected income is subject to a number of risks, which can be classified as follows (Bodie 1990):

1. Adverse political change—the possibility that the rules of the game will change in such a way that income in retirement turns out to be much less than was promised.
2. Poor investment returns—the possibility that retirement income will be inadequate because of low return on contributions.
3. Volatile investment returns—the possibility that retirement income, while adequate on average, will be very low for extended periods of time.
4. Longevity—the risk that the retiree will outlive his or her savings.
5. Inflation—the risk that inflation will erode the purchasing power of a pension.

No pension scheme can eliminate all of these risks, and there are difficult trade-offs involved. Higher returns on contributions normally come at the expense of greater volatility, for example. And protection of the purchasing power of a pension comes at the expense of income, at least in the early years of retirement.

These five types of risk take as given the total amount of forced savings. But there also exists the risk that a worker might cease contributions to a pension scheme. Workers who die have no need for retirement income, but he or she may have dependants who were counting on continued support. This risk can be covered with life, disability and unemployment insurance, so is conceptually quite different from the other types of risk listed above. Nonetheless, public pension schemes typically include survivors' benefits (a form of life insurance), disability pensions, and credits for years of unemployment or low earnings.

Markets for life insurance in general perform well, at least for provision of lump-sum benefits to survivors, and a minimum income in old age is guaranteed by the first pillar of the pension system. Rather than provide life insurance, the State may thus choose to mandate the purchase of a minimum amount of insurance, much as is done in the case of liability insurance for drivers of automobiles. But it is difficult to imagine any entity other than the State providing comprehensive disability and unemployment insurance. If a decision is made to privatise pensions, care must be taken to assure that workers continue to be covered by life, disability and unemployment insurance.

Political risk

Private, individual accounts score high marks for political risk, but privatisation does not eliminate all political risk. Governments have been known to default on bonds included in the assets of pension funds, they enact legislation that affects the value of corporate stocks and bonds, they impose taxes on pension funds, and they regulate funds in ways that are not always in the best interests of the investor.

Pay-as-you-go systems can be quite risky, because current workers support today's retirees with the understanding that these efforts will be repaid by tomorrow's workers. There is no way for today's workers to bargain and contract effectively with unborn generations, so there is always a fear that tomorrow's workers might revolt. The fear becomes more credible when the ratio of retirees to workers rises, either because of demographic changes or because workers are allowed to retire with attractive pensions at younger and younger ages. On the other hand, an increase in the number of retirees, and workers close to retirement, implies an increase in the number of voters who defend an existing pension system.

A political risk for participants in any defined benefit system, public or private, is that the rules of the game will change so as to increase the returns on contributions for one group of workers at the expense of another group. This can easily happen when there is no rule that all contributors to pillar 2 ought to earn the same rate of return. Note that this rule does <u>not</u> mean that the rate of replacement of earnings of workers with low incomes must be the same as those with high incomes. Workers with low incomes generally live shorter lives, so, as compensations, pensions must replace a larger proportion of their income in order to equalize rates of return. A workers entire history of contributions must be taken into account as well, for basing the pension on only the last few year's income means that those who enjoyed promotions (who are generally more wealthy) enjoy a higher return on their contributions.

The forced savings of pillar 2 typically finance a profusion of 'free' benefits for participants. Credits are given to workers for years of unemployment, military service, higher education, or rearing of children. This increases the size of the pension, hence the return on contributions, for recipients of such credits, at the expense of other participants. Single-income couples often receive more generous pensions relative to contributions than dual income couples or single workers. Not everyone has dependents, so provision of 'free' survivor benefits also redistributes wealth away from dual income couples and workers who choose not to marry.

It is important to emphasize that, although these benefits are free for those who receive them, it is contributions to pillar 2 that pay for them. In effect, benefits unrelated to individual contributions are financed with payroll taxes.

Investment returns

Proponents of privatisation argue that participants in pension schemes will earn a significantly higher return if their contributions are invested in stock markets rather than transferred to current retirees. Equity investments in the United States are said to yield 9% a year after inflation, compared to the 1.5-2% returns expected on average for current contributors to public pensions in that country (Feldstein, 1997; Geanakoplos et al, 1998). This frequently cited 9% real return on equity is an average for the past seven decades, however, and it has been extremely volatile, with a standard deviation of 20%. (See table 1.) This means that in any given year, there is one chance in three that returns are as high as 29% or as low as negative 11% In addition, there is considerable serial correlation in the returns, which means that good years are bunched with good, and bad years with bad. This is not desirable for someone who depends on a pension as a sole or primary source of income.

Moreover, the United States is a very successful capitalist system, so a century of high returns on equity in that market is no guarantee that investors will enjoy high returns in other markets, or even in the United States market in the future. Goetzmann and Jorion (1997) provide convincing evidence that the United States is an exception rather than the rule in terms of investment returns. They compare United States stock market indices with those of 38 other countries which have histories of stock prices dating back to the 1920s. Stock prices in the United States have appreciated in real terms at about 5% a year, compared to less than 3% in the United Kingdom and Canada, and a median rate of about 1.5% in other countries. (There is a dearth of information on dividends paid to shareholders, so these calculations are limited to capital gains, thus understate total returns to stock ownership.)

Bonds provide savers with a more stable income, at the cost of a lower rate of return. In the United States, the real return has averaged less than 1% in the case of the safest investment, Treasury bills. (See table 1 once again.) Similar relationships hold everywhere that equity and bond markets coexist. For this reason, financial counsellors generally advise clients first to invest primarily in equity, to gain the advantage of a large, though volatile, return, then to shift gradually to bonds as the date of retirement approaches. Equity is too volatile to provide stable income in retirement years, although it can be a valuable component of an investment portfolio during the accumulation phase.

Participants in a pay-as-you-go pension scheme are saving, even if their contributions are never invested in stocks or bonds, for they sacrifice consumption now in return for a promise of income in the future. Samuelson (1958) and Aaron (1966) demonstrated long ago that the return on contributions in a mature plan of this type is equal to the growth of covered wages, provided that life expectancy does not change. Since life expectancy changes only slowly, and wages tend to be a constant fraction of national income, the Samuelson-Aaron rule implies that the real return on contributions in a mature pay-as-you-go scheme will be approximately equal to the rate of growth of gross domestic product (GDP). Early participants earn returns much greater than this, as do participants at any time benefits are increased, so the Aaron-Samuelson rule is the minimum return on contributions to a pay-as-you-go scheme provided the rules of the game do not change.

We have seen that 100 per cent equity is too risky a portfolio for a pension fund, at least for one in which there are retirees drawing from it as well as workers accumulating savings. In the real world, prudent managers of unregulated pension funds always invest in a mixture of stocks, bonds and other assets. To facilitate inter-country comparisons, the first column of table 2 reports the real (inflation-adjusted) returns that might have been realized in a number of developed economies in the 1967-1990 period from a portfolio invested one-half in broad holdings of domestic equity and one-half in short-term domestic bonds. The second column shows the expected return on contributions in a mature pay-as-you-go system, proxied by the growth in GDP. Pay-as-you-go often performs surprisingly well in terms of mean return, and is always better in terms of risk. The standard deviation of the portfolio return is in every case much larger than that of GDP growth. 3/ Past

performance, of course, is no guarantee of future results, as mutual funds constantly remind us. But these figures do give some quantitative perspective to the debate.

The argument is often made that privatisation of pensions can encourage the development of capital markets in countries where these are weak or nonexistent. But equity investments in a developing economy are much more volatile and risky than in countries with broad financial markets. For this reason, regulators often restrict investments by private funds in such economies to government bonds. In Chile, which embarked on a highly publicised privatisation experiment in 1981, pension funds at first invested primarily in government bonds and short-term money markets, and even now a substantial part of their portfolios consist of Chilean government bonds. In Mexico, also, the recently created private funds have invested nearly all their assets in indexed Mexican government debt. International investments are proscribed in Mexico and severely limited in Chile, even though diversification through overseas investment is precisely what is needed in small economies to increase returns and reduce risk. Of course, investment in London and New York does nothing to develop local equity markets. But should the forced savings of workers be put at risk in this manner? Or is there a more equitable way to promote financial deepening?

In sum, private funds promise a high return in the accumulation phase, although this requires a portfolio biased toward equities. Investment in equities is riskier than investment in bonds and in most countries entails the purchase of shares on foreign stock exchanges. In addition, it is necessary to subtract from the gross returns the costs of administration, which are everywhere higher for private than for public pension plans, and are particularly high in the case of private individual accounts (Thompson 1999; Murthi, Orszag and Orszag 1999). In The Netherlands, annual administrative expenses for public pensions amount to 1% of contributions, compared to 7% for employer pension plans and 24% for individual accounts (Davis, 1997, footnote 44, p. 29). These are typical private/public cost differences for developed economies, and the gap is much wider in developing countries such as Chile.

Insurance for longevity and inflation

When workers retire and begin to draw on their accumulated savings, they require more than a high and stable return on contributions. They also require insurance against the risk of outliving their savings and protection from the potentially devastating impact of price inflation. Defined-benefit public pensions provide this automatically, whereas individual private accounts do so only if they are first transformed into real annuities. 4/ This is where markets everywhere fail, even in sophisticated financial centres, as the World Bank (1994, pp. 329-331) freely concedes.

An annuity is a series of payments made at regular intervals that continue until a specified event occurs. When the event is death of the recipient of the payments, this is a lifetime annuity. Other types of annuities are possible, including a two-life annuity where payments continue to a widow or widower following the death of the initial recipient, but these need not concern us at the moment.

An example will be helpful. Consider a hypothetical worker who retires at age 65, with a final salary of 10,000 pesos a year, having accumulated 100,000 pesos in an individual retirement savings account. Prior to retirement, he, or the manager of his fund, shifted his investments out of volatile equity into short-term or indexed bonds. Let us assume that these bonds offer a stable return of 1 per cent a year and, for the moment, that consumer prices are stable. In other words, there is no inflation so nominal returns are equal to real returns.

Our worker belongs to a demographic group of people who expect to live 20 years from age 65. But this is only an average. Some individuals will die before they are 70 while others will live to complete 85, 90, even 100 years of age. Each individual worker faces the risk of longevity, of outliving his or her savings. An individual, acting alone, can reduce this risk only at great cost

in terms of a lower standard of living. But the group can pool this risk and provide each individual member with lifetime payments in the amount each would receive *with a certain death at age 85*. This is known as *annuitization* of wealth, i.e. the transformation of a sum of money into a series of payments to be made at regular intervals until the death of the person. Our worker's accumulated savings of 100,000 pesos will allow him to purchase a lifetime annuity payable at the beginning of each year in the amount of 5,486 pesos, less any costs of administration. The assets of those in the group who die early provide for the pensions of those with an unusually long life span.

In practice, we observe that few individuals annuitize their wealth, unless they are forced to do so. This is said to be the result of 'adverse selection' in the market for annuities: those who expect to live exceptionally long lives are most attracted to annuities, and insurers are unable to distinguish these 'bad' risks (those with long lives) from the 'good' risks (those with short lives), so have to price annuities in such a way as to make them unattractive to the person with average life expectancy.

Is adverse selection all that important as an explanation for the failure of annuity markets to thrive? It is true that purchasers of annuities live longer, on average, than those who do not purchase annuities. But purchasers of annuities are also wealthier than the general population, and live longer on this account, so it is not clear whether this observed longevity is the result of adverse selection or simply the fact that annuities are purchased only by those with high incomes. In any event, adverse selection affects life insurance without causing such severe market failure, so it is difficult to see why its effect would be any different for annuities, which are sold by the same firms that sell life insurance. (With life insurance, payments are contingent on death occurring, whereas with annuities payments are contingent on death not occurring.)

Quite another problem is 'creaming', which occurs when government regulators do not allow insurers to classify purchasers of private annuities by characteristics other than age for the purpose of charging them different prices. When forced to offer annuities on the same terms to everyone of a given age, insurers attempt to 'cream' the 'good' risks, i.e. those with short life expectancies, such as sky divers, chain smokers and miners. They avoid 'bad' risks, such as women, who live many years longer on average than men. Women and healthy males may find it difficult to purchase annuities. This is market failure, but failure of a different type, caused by rules imposed by government on the industry.

There is another, simple explanation for widespread lack of interest in annuities, and this is myopia. Short sightedness is, after all, the justification for a compulsory second pillar of retirement saving. There is no reason for myopia to disappear the moment a worker retires. Left to their own devices, workers may discount the future heavily, increasing their consumption in early years of retirement at the risk of living with low income in later years. If government provides a means-tested basic pension under the first pillar of the pension system, there is an even greater incentive to increase present consumption, for there is no risk that any elderly person will fall below the poverty floor established by the State.

Myopia might also explain another phenomenon: popularity of nominal over real annuities in those countries without a recent history of high inflation. Even modest inflation causes the real income stream of a nominally fixed annuity to tilt strongly toward the present. To return to our worker with accumulated savings of 100,000 pesos, figure 1 shows the effect of differing rates of inflation on the purchasing power of the annuity payments. We assume that the inflation is steady, fully anticipated, and incorporated into the nominal rate of interest so that the real rate of interest remains constant at 1 per cent. With zero inflation, or with a fully indexed annuity, the purchasing power of the annuity is constant at 5,486 pesos a year. With 4 per cent inflation a year, the nominal payment is 7,665 pesos a year, but its purchasing power falls to 5,385 pesos in the 10th year and to 2,020 pesos in the 35th year. The retiree is clearly better off with a nominal annuity rather than an indexed annuity for the first 10 years of retirement. If he discounts the future heavily, or knows that he will become eligible for a basic pension from the first pillar should his real income fall too low, he

will prefer the nominal annuity. Higher rates of inflation tilt the real payment stream even more, as can be seen in figure 1.

Defined-contribution systems based on 'notional accounts' also require transformation of the accumulated balances of each participant into an annuity stream upon retirement. James Buchanan (1968, p. 394), an early proponent of such a system, recognized the need for protection against inflation, so recommended that participants be offered a variable annuity linked to the rate of growth of GDP. GDP growth is a proxy for return on contributions in a pay-as-you-go system, and, so long as nominal GDP grows faster than consumer prices, will provide increasing purchasing power for any annuity stream. Buchanan recognized that "the variable annuity would be necessarily lower during the years immediately following retirement than the fixed [nominal] annuity" because the real payment stream would have a positive rather than a negative slope.

Purchasers of annuities face an additional investment risk, and this is the possibility that the market value of their accumulated assets, or the relevant rate of interest that determines the stream of annuity payments, or both, may be unusually low at the time they retire. Mandating the purchase of real annuities resolves any problems of myopia or adverse selection, but it increases this investment risk by reducing options available to retirees. Participants in unfunded, defined-contribution schemes that pay notional interest on savings also face this risk, but it presents less of a problem than in the case of funded accounts, for notional returns are not as variable as market returns on long-term bonds or equity. Participants in defined-benefit schemes, whether funded or not, avoid this risk in essence by accepting an average rate of return that does not vary by year of retirement.

Redistribution in the second pillar?

The first pillar of a pension system is noncontributory and guarantees a basic pension to each disabled or elderly person, so it redistributes income from those who are relatively well-off to the elderly poor. The third pillar encourages savings but does not redistribute of income or wealth. What about the second pillar? Should it redistribute income and wealth?

In developing economies, contributory pension schemes typically cover only a small part of the population. Redistribution within pillar 2 misses most of the poor, who labour in the informal sector. It also misses the wealthy, whose income is rarely subject to payroll taxes. In such countries there is no question that the problem of poverty among the elderly poor must be addressed by the first pillar.

But what if there is no first pillar? This is indeed the case for nearly all low-income countries, where governments concentrate on expansion of pillar 2 rather than introduction of pillar 1. In my opinion, this is a mistake. It should be possible, even in the poorest country, to ensure that each person receives a basic, minimum pension when he or she becomes too old to work. If tax collection is difficult, the basic pension could be means-tested. To further reduce costs, the basic pension could be restricted to the disabled. Another reason for restricting pillar 1 benefits to the disabled is that a dearth of birth certificates in low-income countries makes it difficult for authorities to obtain a reliable proof of age.

But don't universal pensions undermine the system of social security that operates within the family? Perhaps. But not necessarily, for three reasons. First, in a wide range of societies there is remarkably little transfer of income upstream to the elderly in any case, even though everywhere there are large transfers downstream to their children and grandchildren (Willmore 1998). Second, state pensions do not prevent young people from continuing to give love and companionship to their parents and grandparents, something governments can never provide. Third, family and friends will be encouraged to donate goods and money to the elderly if these transfers are omitted from calculation of eligibility for means-tested pensions.

Even when pillar 2 covers the entire working population, policies to redistribute income and wealth are best left to the first pillar and to progressive taxation. Recall that the second pillar of a pension system amounts to compulsory

savings. This is true regardless of whether the pillar is private or public, funded or unfunded. And the working poor are forced to save a higher fraction of their incomes than are wealthier participants. It is only fair, then, that pillar 2 offer each worker the same return on his or her savings.

When rates of return vary by participant, the link between contributions and benefits is weakened, and the forced saving of pillar 2 is transformed into a payroll tax, which is very regressive. By regressive, I mean that the rate of taxation is highest for those with the lowest incomes. Typically, all workers, no matter how poor, are forced to contribute to pillar 2 from their very first peso of income. And there is almost always a wage ceiling, above which no contributions are collected. So, even though the rate of contribution is flat, the wealthiest workers—those with wages above the ceiling—contribute less as a percentage of their total income. And the very wealthy, who are self-employed, with no income from wages, often contribute nothing at all. It makes no difference whether contributions to pillar 2 are collected from employees or from their employers; the burden of a payroll tax inevitably falls largely on workers (Willmore 1998).

Those who favour redistribution in pillar 2 point out that specific consumption taxes, such as those on tobacco products, are often more regressive than payroll taxes. But the purpose of consumption taxes is to discourage the purchase and use of specific products; the fact that they weigh heavily in the household budgets of the poor is secondary. Governments have no desire to discourage employment of labour, so payroll taxes, in contrast, are difficult to justify.

In practice, it is difficult to equalise rates of return of participants in a pension plan. *Ex post* returns, in any event, vary widely. Retirees who live exceptionally long lives receive more pension income than those who die relatively young. But a pension is insurance against longevity, so those who experience longevity are compensated for this event just as purchasers of flood insurance are compensated if they suffer water damage. Those who die young (or their heirs) have no right to demand a refund of contributions, just as those who remain dry have no right to demand a refund of premiums paid for flood insurance.

What matters are the *ex ante* returns. If the purchaser of flood insurance for a property on a hill pays at the same rate as the purchaser for property in a river valley, then we can say the system is not fair because the insured risk is not the same. Similarly, in a pension scheme, replacement of the same proportion of everyone's covered income is not fair because participants do not have the same life expectancy. There is a well-known positive correlation between wealth and life expectancy (Smith 1999). The very poor, and those employed in hazardous occupations, are less likely even to reach the age of retirement. It is important that their expected return on contributions be at least equal to that of others. This can be accomplished though the provision of generous survivor's benefits and by classifying workers by income and occupation, in order to provide pensions appropriate for each group's expected longevity. In addition, the accumulated contributions, with interest, of participants who die before retirement could be bequeathed to a spouse or children, to augment their old-age pensions. Accumulation can take place in either a real or a 'notional' pension fund.

Under the 'equal return on contributions' rule, a female worker receives a smaller pension than a male of the same age with the same history of wages and contributions. This is due to the fact that women, on average, live longer than men once they reach retirement age. Nonetheless, pension plans rarely treat female workers in this fashion. Even employer-sponsored, defined-contribution pension plans of pillar 3 apply 'unisex' factors to transform accumulated contributions into an annuity. This means that the rate of return on contributions is much higher for women than for men, so pension wealth is transferred from men to women. In other words, a portion of the pension contributions of men are taken to subsidise those of women. Female workers on average earn less than male workers, so, on balance, this is a progressive rather than a regressive redistribution of wealth. It is one exception to the equality rule that poses no particular problem.

Other departures from the 'equal return on contributions' rule result in regressive rather than

progressive redistribution of wealth, so are not so benign. Consider, once again, the common practice of granting a more generous pension to a retiree with a dependent spouse (almost always a woman) compared to that granted to a retiree who is unmarried or has a working spouse, but an otherwise identical history of wages and contributions. This openly unequal treatment of participants is intended to subsidize the traditional family and reward parents (inevitably mothers) for staying at home to care for children. But the subsidy is financed from payroll taxes on workers who, on average, are poorer than the beneficiaries of the policy. And the largest subsidies go to those single-income couples with the largest income.

Society may choose to provide retirement income, over and above a basic pension, to women who seldom participate in the remunerated labour force. But these are noncontributory pensions, which can be handled more transparently and more equitably in pillar 1 than in pillar 2. If desired, the pattern of benefits typical of most current plans could be retained by awarding each housewife a pension proportional to the pillar 2 pension of her husband, and awarding it from the date of retirement of their husband, regardless of the age of the housewife. The only difference would be the financing of this pension, which would come from general government revenue rather than from the forced savings of workers (male and female).

Since the distribution of benefits in pillar 1 is transparent, society may choose to use nontraditional rules for award of these noncontributory pensions to housewives. All housewives could be given a larger basic pension compared to men or to women who work outside the home, and receive it from an earlier age. This would result in progressive redistribution of income, since noncontributory pensions for housewives would not be related to the contributory pensions earned by their husbands. Another possibility is to reward motherhood and unpaid labour in the home by linking the size of basic pensions for women to family size, irrespective of whether or not a woman works outside as well as within the home. There are many possibilities. The point is that there is no particular reason to link pension payments for housewives to those for their husbands, as is currently the case almost everywhere in pillar 2.

Conclusion

The traditional pay-as-you-go, public system of pensions has the potential to provide workers with excellent security of income in old age. When investment and inflation risk is taken into account, its rate of return on contributions compares favourably with private, individual accounts. The difficulty is that contributors to pay-as-you-go schemes are not treated the same; benefits are not linked closely to contributions, so some participants receive a high return at the expense of others who receive low or negative returns on their contributions.

Privatizers are on solid ground when they argue that poverty alleviation should not be financed with payroll taxes, because these are ultimately paid by employees in the form of reduced take-home pay, even when the employer is legally responsible for paying them (Willmore 1998). Contributions to a pension scheme represent savings (sacrificed consumption), regardless of whether the funds are invested or not, and workers naturally would like these savings to grow at the highest possible, risk-adjusted return. Privatisation, with individual, funded accounts, promises to accomplish this automatically, but it can also be accomplished by reform of pillar 2. Either option—reform or privatisation—requires an expanded pillar 1 to handle redistribution of income and wealth.

Ultimately, the decision whether to adopt a public or a private system of pensions for the second, non-distributive pillar depends not on economics, but rather on one's view of what role the State ought to have in society. Those who favour privatisation value intangible benefits, such as the increased sense of ownership and responsibility that comes from allowing workers to make some choices regarding the allocation of their forced savings. They also believe that the State has a social agenda, and will use any revenue it receives to further it, so cannot be trusted to provide workers with a fair return on their savings.

Those who favour public provision of pensions point to the higher administrative costs of private pensions, investment risk, and the inability of private markets to provide retirees with affordable, indexed annuities. But they also emphasize social goals, such as redistribution of income from those with high lifetime covered earnings to those with low lifetime covered earnings, or from those with many years of contributions to those with a weak attachment to the remunerated labour force. Their case would be stronger if the social agenda were restricted to pillar 1, which is financed from general taxes paid by wealthy citizens as well as wage earners. If this is not possible, then privatizers have a point: privatisation of the pension system, the creation of individual, funded accounts, may be necessary to guarantee that all contributors are treated the same. Governments would then be forced to fund social programmes from general revenue rather than rely on payroll taxes that weigh heavily on low-income workers.

Endnotes

1 Blinder (1988) is not a proponent of this position, but he spells it out very clearly. Davis (1999, p. 2) would replace compulsion with tax incentives in "relatively advanced countries," but not in countries that lack a "savings culture," so he espouses liberalism with limits.

2 This point is no longer debated in the literature. Kohl and O'Brien (1998, paragraph 14, p. 12), for example, conclude after an extensive survey that "gains to national saving from pension reform will come only if public saving, defined to include changes in the net deferred liabilities of PAYG [pay-as-you-go] schemes, is increased."

3 The depressed Tokyo stock market of the 1990s is an excellent illustration of the potential implications of this volatility. Average prices of equity shares, as measured by the Nikkei index, doubled between 1987 and the end of 1990, then fell to their 1987 level by 1992. In 1998, shares on the Tokyo exchange were trading at 1985 prices, and bond returns were similarly depressed.

4 By real annuity it is meant that the payments increase along with consumer prices so as to preserve their purchasing power.

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Figure 1 Effect of Inflation on Purchasing Power of Nominally Fixed Pensions

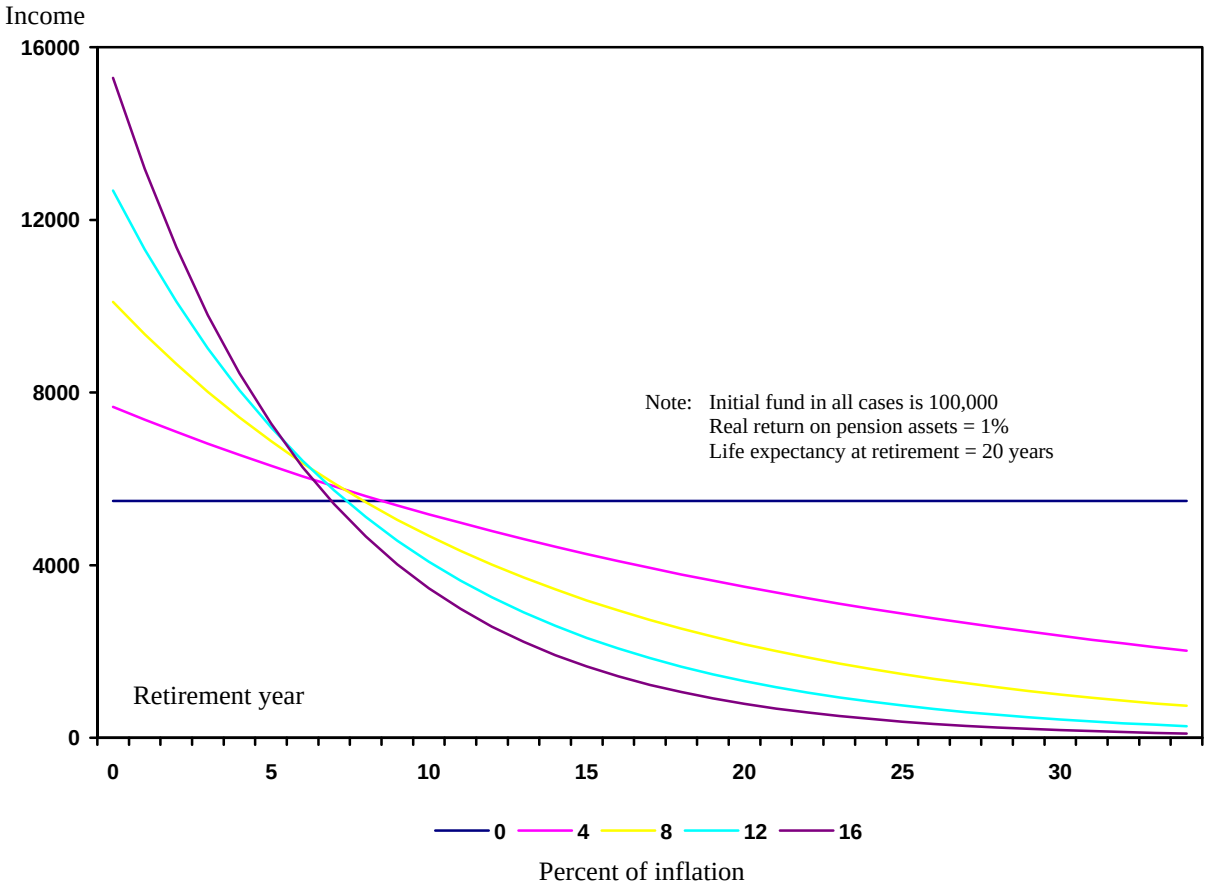

Table 1. United States: Real (inflation-adjusted) returns on equity and government bonds, 1926-1996.

Asset	Mean	Standard Deviation
S&P 500	9.4	20.4
Long-term bond	2.4	10.5
Intermediate-term bond	2.3	7.1
Short-term Treasury bill	0.7	4.2

Source: John Geanakopolos, Olivia S. Mitchell and Stephen P. Zeldes, "Would a Privatized Social Security System Really Pay a Higher Rate of Return?" Wharton School of the University of Pennsylvania, Pension Research Council Working Paper 98-6, 3 August 1998, table 2.

Table 2. Returns on private portfolios versus potential returns on unfunded public pension plans, 1967-1990.

(means of real total returns in local currency, standard deviations in brackets)

	Private Portfolio[1] (%)	Public Pension[2] (%)
Australia	2.7 (16.1)	3.6 (1.9)
Belgium	4.2 (16.7)	3.1 (2.2)
Canada	2.2 (11.2)	3.8 (2.3)
Denmark	5.3 (18.9)	2.5 (2.2)
France	5.2 (15.9)	3.3 (1.7)
Germany	6.1 (15.2)	2.8 (2.3)
Ireland	3.8 (13.3)	4.6 (2.2)
Italy	1.9 (18.7)	3.6 (2.5)
Japan	5.5 (15.5)	5.5 (3.2)
Netherlands	4.5 (17.0)	3.4 (2.8)
Sweden	3.8 (13.5)	2.5 (1.7)
United Kingdom	3.8 (14.8)	2.4 (2.3)
United States	2.1 (12.9)	2.6 (2.2)

1. Artificial portfolio composed of 50 per cent domestic equity and 50 per cent domestic bonds.
2. Annual growth in real gross domestic product.

Source: (1) OECD, *Maintaining Prosperity in an Ageing Society* (Paris, OPECD Publications, 1998), table V.2, p. 67, (2) calculated from national sources, annual real GDP growth.