The Geneva Papers on Risk and Insurance Vol. 26 No. 3 (July 2001) 418–434

The Controversy of Funding Versus Pay-As-You-Go: What Remains of the Debate?

by Jan B. Kuné*

The present article deals with some basic characteristics of both pension finance systems pay-as-you-go and capital reserve. The merits and demerits of both finance systems are discussed at length. The major question mostly asked is whether funding does matter and if so, what conditions have to be fulfilled. Funding generally does not transfer the pension burden over time, opposed to frequent usual thinking. Apart from stimulating national savings and investments the major advantage of funding is that it provides the best way of securing pension liabilities and an adequate mechanism for solving the distributional problem of national product between the retired and non-retired by the ownership of (part of) the capital stock. After many years of debate of pay-as-you-go versus funding it can be concluded that the debate has lost much of its heat. The issues are better understood and there is convergence on some basic points.

1. Introduction

The debate or what remains of it on both pension finance systems pay-as-you-go and funding is dealt with in the present article. After some introductory remarks on the basics of pension finance the relative merits of pay-as-you-go and funding are presented in section 2. In section 3 it is explained that in advocating the transfer from pay-as-you-go to funding virtually always the wrong arguments are used. In section 4 the question whether funding does matter is dealt with and if so, which conditions have to be fulfilled. Section 5 looks at the relevance of the ownership of capital in respect of the long-term viability of pension schemes. Section 6 makes some further observations and section 6 offers some concluding remarks.

A standard framework distinguishes four resources of economic security during old age. They are termed the four pillars of retirement. The first pillar includes public (basic) pension income maintenance programmes, often means-tested. The second pillar refers to industry-wide or company-based occupational pension schemes, being part of labour conditions and jointly organized by employers and employees, whereas the third pillar refers to private personal pension saving schemes. Working (partially) after the current or statutory retirement age is the fourth pillar, being increasingly important as life expectancy is longer and working life and retirement become more flexible. This particular pillar has been proposed and studied by the Geneva Association since 1987.

By far the largest share of total pension benefits in the European countries is accounted for by public basic pension plans (the first pillar). In the western countries all the basic and a moderate part of the complementary pension schemes are financed on a pay-as-you-go basis. Retirement provisions through funded schemes appear to be most widely applied in the

* The author is with the ABP Pension Fund, the Public Employees' Pension Fund in the Netherlands. He is also associated with the Amsterdam University. The views expressed in this article are his own. Responsibility for any errors in the analysis remains with him. Tel.: 31.45.5792005; fax: 31.45.5793630; e-mail: jb.kune@abp.nl.

Published by Blackwell Publishers, 108 Cowley Road, Oxford OX4 1JF, UK.

Netherlands, the U.K., Switzerland, and to a lesser extent the U.S., Canada, Ireland and Finland. Participation in supplementary pension schemes (the second pillar) can be voluntary or compulsory. In the developing countries and the Eastern European transitional economies, capital accumulation by complementary pension plans appears to be much less, both because their coverage is much lower and because they tend to be largely unfunded.

All developed countries will show a sharp rise in the dependency ratio, doubling or more, in the next forty years.[1] When the replacement ratio can be assumed to remain constant the pension burden grows directly with the rise in the dependency ratio. The old-age problem therefore can be considered as the classical distributional problem of national product between the retired and non-retired.

The basics of pension finance

Any judgement about the sustainability of future pension payments – irrespective of whether they are of the basic type or supplementary type, personal or on a collective basis, funded or pay-as-you-go-financed – only depends on the productive capacity available in the future to finance all liabilities in respect of pension obligations and a multitude of other obligations of national interest.

Evidently, the pension burden on any society is dependent upon the amount of future payments in respect of all old-age income provisions, but above all on the expected size of the future national product. More accurately, the costs of a pension scheme or the true measure of the *pension burden* for the society as a whole are the resources or benefits forgone, the resources that are no longer available (for consumption of the non-retired and for investment purposes), as they are being used for supporting the elderly. A doubling, for example in the size of the aged will, *ceteris paribus*, simply double the burden of support on the national economy. Or, in other words, the larger the ratio of pension rights to GDP, the higher the share of future national product to be committed to pension expenditures.

When the tax and contribution burden is *felt* to be no longer sustainable in the sense that it will rise to an unacceptably high level for the group of tax- and contribution-payers – then probably such is true as well for the welfare state as a whole as it is financed also on a pay-as-you-go basis – cuts in pension expenditures or reduced spending elsewhere have to be considered.[2] Eventually this is a political issue.

It can be shown, however, that a moderate growth rate of labour productivity is sufficient to offset the *ceteris paribus* decline in average *per capita* consumption due to aging (Kuné, 2000). Nonetheless serious budgetary problems can arise, which are harmful to a good performance of the economy.

It is argued frequently that pension funding may be useful in creating a resource base,

---

[1] See, e.g. Bos *et al*. (1994) and Lutz (1994).

[2] Studies to reveal the macro-economic effects of population aging have not produced unambiguous evidence. Some of them suggest that population aging will have a substantial (and negative) impact on macro-economic variables as aggregate savings, investments, labour productivity, employment, social security, etc. (Masson and Tryon, 1990). Some others conclude that there will be no major problems in respect of productivity or even social security finance (Cutler *et al*., 1990; Miles and Patel, 1996; Börsch-Supan, 1996). All that can be concluded so far is that the findings from macro-economic studies are highly sensitive to the assumptions made and thus highly conjectural. This will not surprise us. Evidently population aging will have a major effect in the field of health care and some other social services. See, e.g. Disney (1996), Barr (1998), and Jackson (1998).

thereby enabling a larger future volume of production and consumption.[3] A shift from pay-as-you-go to funded schemes therefore is highly recommended by many authors and official institutions. This makes it easier to overcome the problem of distributing the available national product among different groups of population. This issue is of great theoretical and policy relevance and needs to be examined in more detail. Hence in section 3 we shall turn to the topic of whether funding does matter and, if so, which conditions have to be fulfilled.

2. The relative merits of funding and pay-as-you-go

In the case of a funded scheme employees pay part of their (labour) income into a fund of financial assets from which eventually the pensions are paid out. The retirement pensions are paid out of current capital income, originating from investment revenues and by selling assets – more accurately, the physical or real capital goods as productive capacity hidden behind these assets – to the younger generations.[4] A funded system relies more on the development of the international capital market as opposed to the dependency of a pay-as-you-go based system on the domestic labour market.

Under a pay-as-you-go system pensions are paid out from contribution payments (predominantly out of domestic labour income) only. Instead of the lifecycle reallocation of a cohort's (or cohorts') aggregated income, there is a cross-sectional income redistribution from workers to pensioners on the basis of an implicit social contract: each generation finances the pension income of the previous generation on the understanding that its own pension income will be financed by the next generation, with the inherent risk that future generations can break the contract, at least in part. Pay-as-you-go schemes can bring about systematic income redistribution or, in other words, individual people generally will not break even over their lifecycle. Pay-as-you-go based pension plans are normally implemented through the state's power to levy contributions.

The merits and demerits of funding and pay-as-you-go have been discussed at some length. Both systems have their advantages and disadvantages.

There are at least two main reasons why pay-as-you-go programmes have proven to be so popular in the decades following World War II. First, in a funded system it will take many years to build up a reasonable pension. In contrast, under a pay-as-you-go system a full pension can be paid immediately, with a transitional gain to retirees and the older cohorts of workers. Starting a pay-as-you-go scheme, mostly covering the national territory, in the years following World War II was rather easy, as the ratio of workers to pensioners and the expected population trends were favourable. There have been some definite winners and no losers or, in other words, when the pay-as-you-go schemes were installed, the first generation(s) of pensioners had a "free lunch"; they received pensions without having, or only partially

[3] It is often argued that the pension systems in e.g. France, Germany and Italy are not sustainable in the coming decades. If funding is (a part of) the solution, countries like Switzerland, the Netherlands and the U.K. are (happily) faced with a problem that can be easier dealt with than that of aforementioned continental European countries. Remember, if funding makes little difference, all aging countries may have a similar problem ahead. From a security point of view, the U.K.'s pension system undoubtedly is preferential to the systems we find in e.g. France, Germany and Italy. As pointed out in the previous note we may wonder whether there exists a significant aging problem.

[4] Note that an aging society generally holds a larger capital stock, hence a higher capital intensity (or capital–labour ratio), a declining capital productivity and a rising labour productivity and higher real wages. Therefore, an enhanced capacity is created to finance old-age pensions. The younger generation acquires the ownership of assets, behind which the physical capital stock hides, from the aged.

having, contributed.[5] Second, because pensions are paid out of workers' contributions, they can be quite easily increased, reflecting changes in prices and/or wage-level, without levying increasing contribution rates from workers' income.

Pay-as-you-go schemes probably will be preferred in a world with large economic change and uncertainty (at least when a continuing flow of contributions in a designated geographical area can be relied upon). Of particular relevance is that pay-as-you-go systems stand the risk of a low real rate of investment return and low asset prices due to persistent (and unexpected) inflation, a high capital intensity and other unforeseen events over which society has no control. Under a pay-as-you-go based system, society, though it can definitely not guarantee a previously promised level of pensions, can better control the conditions of the social contract between generations. On the other hand, the aging-linked perpetual rise in pay-as-you-go contribution rates may contribute to higher labour costs and labour market distortions, hence a higher future unemployment level and a smaller coverage, thereby deteriorating the conditions of long-term viability. Furthermore, pay-as-you-go schemes are said to minimize obstacles to labour mobility at home, but generally not across national borders.

Undoubtedly, one of the most important features of a funded occupational plan is that its premium payments are less likely to be regarded as taxes rather than as own savings for an old-age provision (less difference between gross and net wage level), thereby avoiding to a large extent negative labour market distortions and probably giving rise to an increased labour-force participation. Clearly, this is beneficial for the economy as a whole, especially in countries where companies and workers are heavily engaged in the informal sector. In Latin American countries, for example, half of the labour force or more is in the informal sector (IBRD, 1994). Generally, a large informal sector diminishes the financial capacity of a basic old-age pensions system based on pay-as-you-go; it also hurts the government's fiscal capacity, thereby crowding out the supply of other important categories of public goods as well. In the worst case evasion can lead to the (near) collapse of the pension system, particularly when workers evade contributions but still qualify for benefits.

In a politically turbulent or destabilized world with insufficient self-control, serious problems will arise in maintaining pay-as-you-go systems. Personally defined contribution plans may then be the only attractive or feasible alternative.

Funding can make another psychological difference as there is anticipatory behaviour involved and this may be one of the advantages of funding. The major advantage in our view is the ownership of capital, to which aspect we shall turn in section 4. A major disadvantage of the funding principle remains that inflation has to be considered as an uninsurable risk, as it affects everyone.

For an individual contribution-paying person, a pay-as-you-go plan is preferential to funding when the sum of the rates of growth of population (n) and of real wages (g) exceeds the rate of interest (r). This is termed the Aaron-condition or Aaron-rule, a rule which is well known. The returns from both pension finance systems to the contribution payer are identical

[5] On the other hand, when transforming a pay-as-you-go plan to a funded scheme, the "last generation" of workers will pay twice: for the present pensioners and for their own funded scheme. There appear to be definite losers and no winners, so the argument goes. But it is not so dramatic as that as workers acquire in turn the ownership of capital assets, and lower consumption today, or increased personal saving, is balanced by greater resources for consumption in the future. The path from pay-as-you-go to fully funded schemes nevertheless will always be rather long.

when $r = g + h$. It appears, however, that what is true on a micro-level is not necessarily (always) true on a macro-level.

Today, pay-as-you-go plans have lost much of their popularity in many countries, being accused of costing too much and having an adverse impact on the economy in an aging society. Funded schemes have received much more emphasis in the last few decades as a result of changing concepts about (personal) responsibilities and choices and more fiscal incentives to provide for one's own pension income. Remember, however, the warning of Barr against "... reliance on funding *alone* to address demographic problems ... To imagine that funded schemes are substantially better in the face of aggregate uncertainty is to fall for crude mythology."

3. Redistribution over time

On a personal or micro-level, the economic function of setting up a pension scheme is to transfer resources from one's working or younger age period to one's older years, thereby creating a claim on future national product. Saving or consumption forgone during the working period is balanced by consumption in the retirement period. On a macro-level or for a society as a whole this is not possible, "... ruling out the case where current output is stored in holes in people's gardens."[6] No generation generally can store (for its own retirement purposes) the commodities that it has produced itself. Apart from (durable) infrastructural facilities, some consumer goods can be stored and saved for consumption later; examples are durable goods like housing facilities, transport facilities, clothes, books and some good wines. But many others, particularly services, can not and, hence, must be produced simultaneously with their consumption. Thus, for a society as a whole there can be, *ceteris paribus*, no redistribution of pension assets and purchasing power over time to a substantial degree. The consumptional expenditures of the elderly, today and in the future, always have to be provided for out of current production in the same time period, irrespective of whether the pensions are funded or not. Or, in other words, the goods and services the retirees consume are always part of the current output of the currrently present working population equipped with the present capital stock.

From an economic point of view it can be held that the costs in respect of any retirement income system, defined earlier as the resources or benefits forgone, are always equal irrespective of the way they are financed. The particular mechanism of pension finance does not violate this basic finding. The pension burden on future generations thus is determined by the pensions to be paid out and not by the way in which they are financed.

Fallacy of composition

It is often argued that the origins of all future pension problems, if any, lie in the failure to start and maintain funded pension schemes rather than pension plans pay-as-you-go financed. If public and supplementary pension plans had accumulated sufficient assets, so the argument goes, paying future pension expenditures would be less of, or not at all, a problem. This

[6] Cf. Barr (1998), p. 214. The possibility and attractiveness of storing durable consumer goods in our view are underestimated by Barr. Storage of durables to some extent and up to a certain time horizon can be of relevance and should not be ignored. ICT (information and communication technology) seems to be in an intermediate position.

"solution", however, will not change the basic mechanism redistributing production among different groups of population, e.g. the retired and non-retired. Or, in other words, basically the competition over resources raised by the pensions paid to the elderly is not removed by the transition from pay-as-you-go to funding. Rather, it is switched from old-age pensioners soliciting a share of labour income to claims over the return on the capital stock. The ownership of (part of) the capital stock in our view is of utmost relevance in securing pension entitlements and solving the distributional problem.

On a personal or micro-level, and on a cohort of meso-level as well, funding clearly is the only feasible way to create an old-age pension. During one's working years actuarially fair contributions are paid in order to receive a pension income in the years of retirement, this from interest revenues and the proceedings from selling pension assets to the younger generations. Such personal savings plans may considerably benefit from tax incentives.

On a macro-level, as a rule pay-as-you-go or any funding principle can be chosen. As observed, the way of pension financing does not affect in its essentials the distribution across time of the resources to be transferred to the elderly. The question arises as to where this misunderstanding and confusion come from. It has been pointed out, for example, by Thompson (1988, p. 213) that "... the tendency to generalize from the individual to the economy is one of the major shortcomings of much of the debate over retirement costs because it often results in what economists call the *fallacy of composition*." It is a fallacy of composition to assume that because something is true for an individual it is (necessarily) true on aggregate. This appears not to be the case. For instance, "... if I stand on my seat in the theatre I will get a better view, but if everybody does so, nobody will get a better view."[7]

4. Does funding matter?

More emphasis on funding is generally recommended to cope with the adverse consequences of population aging in the next century in the western world. This recommendation, e.g. from the IBRD (World Bank) (1994), IMF (1996), OECD (1996,[2] 1998), needs some more explanation.

From a welfare point of view the crucial question arises, "does funding matter?" or, in other words, under what circumstances does funding make a real difference to the performance of the economy? Evidently a major difference between funding and pay-as-you-go is that funding generally leads to an additional flow of saving during the period of growing up – and under circumstances also in an aging economy with economic growth – thereby creating a resource base, which enables higher levels of production and consumption for both future workers and retirees.[8]

From a theoretical point of view the condition of optimal savings has to be fulfilled. If savings accumulated to provide for an old-age pension income, together with all other sources of saving, yield over-accumulation, the pay-as-you-go share in pension financing should be increased in order to attain what economists call the "golden rule" level. Similarly, if in the

[7] Barr (1998), p. 214.

[8] Higher levels of future national product evidently will not alter the spending on old-age pensions in relative terms, but paying for pensions out of a larger economic "pie", still leaving higher incomes (a grown "slice" out of the future bigger economic pie) for the non-retired population in absolute terms, is much more comfortable.

steady-state equilibrium stage, the economy is undercapitalized, public and private pension arrangements should rely more heavily on funding.

Conditions to be fulfilled

The idea of stimulating economic growth by building up a larger capital stock by pension saving is based on four major assumptions.

First, additional pension saving increases, at least in part, total national saving, as long as there are no offsetting reactions by households, firms or government. For instance, saving within a public fund may be offset by increased spending in other government programmes, leading to dissaving to a certain extent, and saving within private complementary schemes might be offset by reduced saving in other forms. If pension savings simply replace other savings, it makes little real difference. For a short survey of how pensions effect personal and total national savings, see, for example, Kuné (2000).

Second, the savings will lead to investments that increase the productive capacity of a country. Or, in other words, investments do not fall short of the savings level. But this is not an automatic process; economies do not behave like well-oiled equilibrium machines. If savings fall behind, this can result in increased hoardings and decreased national income levels (the Keynesian model) or in a (larger) surplus on the current account of the balance of payments (the neo-classical model). If pension savings lead to new productive investments, which would not otherwise have occurred, then funding can make a real difference. The second condition unfortunately was not or at best only partially fulfilled, for example in the Netherlands during the last few decades, where investments fell behind national savings, leading to a large surplus on the current account of the balance of payments. For a small open economy assets abroad can be beneficial.[9]

Third, the capital stock is smaller than according to the "golden rule" level or, in other words, national savings are below their optimal level and are expected to persist for a long time period ahead. It can be argued that savings nowadays in many countries, if not most, on a macro-level are below their optimal level. There appears to be a structural shortage of capital supply, worldwide, particularly in the transitional economies and many developing countries and this shortage may increase further in the coming decades.

Fourth, increased pension saving must be the best way to stimulate productivity. If increasing the national saving rate were a main reason to fund pension plans, there could be found other and maybe even better ways to accomplish this goal. The government, for example, could run a surplus on its budget, thereby creating government savings or use various kinds of incentives stimulating private savings. If there is an alternative policy to promote savings and productivity either more efficiently or with less risk, then it might be the preferred policy. Other fiscal policy measures may provide the government with more direct means of stimulating both public and private saving, thereby avoiding increasing public

[9] A large amount of foreign assets enables a country to maintain the consumption of the population with goods produced abroad. Koopmans (1992), for example, has pointed out that major difficulties will arise on the meso- and micro-level, as foreign accounts are to a large extent owned by companies and banks. This (Dutch) pension fund should invest on a wider scale abroad, e.g. in the newly industrialized economies.

deficits, and possibly also a lower aggregate savings ratio, due to a smaller amount of tax receipts.[10]

But not a unique mechanism to promote savings

When those four conditions are fulfilled, the question whether funding matters and could be part of the solution to the problems caused, for example, by adverse demographic developments and deteriorating ecological conditions can be answered affirmatively.[11]

Funding will be preferred to the extent that it causes national product to be higher. It will be clear that the costs of population aging cannot be avoided. On the other hand by increasing investments now – the economic costs of it or the benefits forgone are the reduced current consumption expenditures of the present generations – one anticipates the difficulties that could otherwise (with no funding) arise in an economy with a lower national product. This favours future generations.

A further expansion of funded occupational supplementary pension plans can be considered as an adequate, but not a unique, mechanism to promote savings. Note, however, that pension finance systems are not created, at least not in the first place, because of the impact they might have on the performance of the national economy. First and foremost, they are designed as a mechanism to adequately provide for pension incomes to the elderly. On the other hand, the two purposes do not necessarily exclude each other, they can be compatible.

Apart from the impact funding can have on the size of future productive capacity, pension saving might be particularly preferential to people as more security can be obtained compared with pay-as-you-go. Or, in other words, the major (economic) difference between funding and pay-as-you-go goes beyond the macro-economic issues of savings and investment. In the next section we pay attention to the merits of funding as an adequate and efficient mechanism and device to strengthen the security of old-age income provisions and provide a solution for the distributional problems involved.

5. Securing pension claims

The argument that funding and pay-as-you-go are equivalent in real economic terms has its own drawbacks as it ignores the basic nature of the economic process and of social and financial institutions in solving the distributional problem.

The notion of a large volume of material goods and services being transferred from their

---

[10] Ideally the contribution level should reflect the liabilities that are being incurred and send the correct and timely signals. This is definitely not a characteristic of the pay-as-you-go system, but such a missing link can be established also without building up a fund. The government can levy higher taxes or contributions, thereby reducing borrowing and diminishing the size of public debt. Decreasing interest payments on public debt can compensate future increases in contribution rates of pay-as-you-go pension plans. This principle (of *notional funding*) underlies the financing practice in respect of the basic pension scheme (AOW) in the Netherlands. From a fiscal point of view the policy of reducing the public debt/GNP ratio (in advance of coming demographic pressure) is equivalent to accumulating a fund.

[11] Note that on the micro-level, decisions in respect of financing pensions are taken with a view to interests of employers and employees only. The national interest (attaining the optimal savings level) and individuals' concern (providing for adequate old-age provisions) do not automatically comply; generally speaking they do not. These interests may be reconciled by well-chosen economic and fiscal policy measures, e.g. adequate tax treatment. Countervailing policy measures of the government in respect of savings might be necessary.

producers, the *de facto* working labour population, to the elderly is artificial and over-simplified.

As already pointed out, to consider workers and pensioners as groups with opposed interests is incorrect from an economic point of view.[12] Evidently national product is the result of the joint input of labour and of capital and as a consequence output is divided between capital and labour, under equilibrium conditions, according to their marginal product, i.e. wage rate and profit rate. This basic distributional aspect is ignored in much of the social security literature. Particularly, at least on a macro-level, the (role of the) ownership of the capital stock is overlooked.

The crucial issue in respect of future pension payment is that it constitutes a claim on future output in exchange for forgoing a part of present output. Pensioners need a firm and solid claim on national product in order to be able to consume the goods and services currently being produced. Under funding the retired population has at its disposal such a claim arising from its identifiable ownership of productive capital as a resource base of its own.[13] A higher labour-force participation of the elderly gives rise to such a resource base as well.

The long-term viability of funded and pay-as-you-go schemes

Capital earnings are received by the owners of the capital assets, i.e. pension funds and many elderly people, on a personal basis. Apart from the expropriation of capital goods in revolutionary times as well as in times of war, the ownership of the capital stock will be a more secure basis for retirement income than the willingness and ability of the current labour force for paying pension contributions under a pay-as-you-go system. If pay-as-you-go contributions alone could satisfy promised pension payments *ad infinitum* one could be content alike without any funding system. But this promise cannot be guaranteed; one can simply not count on it for ever. Economic and social institutions like the ownership of goods and assets, embodied in pension entitlements and other social security benefits, therefore are of much more relevance for the sustainability of old-age income plans than levying taxes and contributions from labour income or capital income as there are many risks involved. Workers can evade contributions, and taxes on capital income are very difficult or impossible to enforce effectively due to the high mobility of the financial capital. Pensioners are thought to be better able to fight for their share of national product as owners of capital than as lobbyists for pay-as-you-go financed pensions. Moreover, underfunding the debate (and hence the concern) on how the number of contributors and their average contribution base are developing is weakened.

Both pay-as-you-go and funding basically act as a mechanism for transferring resources between pensioners and other age groups. The primary point of interest when comparing funded and pay-as-you-go pensions is how pension entitlements are secured, and only in the second place how they are financed. Or, in other words, funding is not a unique mechanism for financing pensions, but funding can be considered as a unique mechanism for solving and

---

[12] From a social and psychological point of view there certainly can and will be opposed interests, as future generations of retirees receive high pension incomes and are (very) wealthy as well. See MacManus (1996), "... today's intergenerational differences primarily involve intensity rather than direction ... Tomorrow, we are more likely to find different generations supporting policy priorities that are diametrically opposed to each other as the nation undergoes its greying metamorphosis and the economic realities associated with it sink in."

[13] Diamond (1997) proposes giving social security benefit promises the same status as private contracts or private property as a means of constitutional protection and insulation against benefit reductions.

controlling the distributional problem in respect of old-age pensions in an aging society, particularly at an unlucky time of deteriorating economic performance. Nonetheless, risks remain.[14]

The nature and basic value of pension rights under both systems is fundementally different. The real value of claims under both systems depends on the availability of future resources as well as on a multitude of other future developments in the world. Underfunding this value is dependent on, e.g. inflationary processes, capital returns and the (market) price of assets.[15] Under pay-as-you-go the claim value depends on the ability and the willingness of workers and tax-payers to finance pension outlays.[16] They can actually refrain from paying higher contributions, but they cannot take away retirees' pension assets.

A funded scheme offers an economic claim on future national product, whereas a pay-as-you-go scheme offers at best a moral claim (on future national product) or not even that: it basically offers an expectation on future benefits rather than a promise of future benefits and the claim is basically dependent on the political and bargaining strength of the elderly population and on the state's power to levy contributions for the public pension system. Though the main argument for nonfunding rests on the quality of the pension promise made by the state; the state, not to mention the managers of a pay-as-you-go system, is in a position to ultimately commit itself to maintaining the present pension level in the coming decades.

Securing old-age social security

It has already been shown conclusively that national product can be divided among different age groups using different methods. Remember that their joint demand will always be constrained by the current total supply of goods and services. Whatever method is used, the actual value of the claim (on future output) of the elderly (or of any other age group) can never be completely guaranteed.

The guarantees given are in some way or other always virtual. In a pay-as-you-go scheme they are based on the strength of an implicit social contract between generations, under funding they are based on the ability of the economy always to yield an adequate return on financial assets.

---

[14] From the point of view of security, equity and efficiency the IBRD (1994) recommends a multi-pillar system, a mixture of the publicly managed and tax/contribution-financed first pillar and the privately managed fully funded second and third pillar. The second pillar can be mandatory and the third pillar will be voluntary. A well developed fourth pillar (continue working) is also very useful. Or, in other words, don't put all your eggs in the same basket. The three-pillar system is also strongly recommended by the Group of Ten (1998). The Netherlands pension system is of the three-pillar type. The first and second pillar are substantial and the third pillar is of slight but rapidly increasing relevance. A fourth pillar practically does not exist.

[15] The spectacular growth in pension fund assets in the last few decades, and the further growth in the near future, may have simply increased asset prices, rather than increased the real capital stock. If the process goes into the reverse direction at some point of time in the 21st century, asset prices may fall just when pensioners want to sell their assets to the younger generations. On the other hand, funding and the concurrent widespread ownership of individual and collective pension capital accounts may even contribute to a larger political engagement for adequate and responsible monetary and fiscal policies.

[16] An interesting discussion on the long-term viability in pay-as-you-go schemes is given by Reynaud (1995). There are two major elements involved. In the first place the need for a constant renewal of the insured population. This may be ensured by making participation compulsory within a designated area which is sufficiently large and socio-economically coherent. The second element concerns the actors in the schemes' management. Managers should not be involved in defending special occupational or sectoral interests, but dedicated to supporting common interests.

When, in the funded scheme, total monetary purchasing power or the demand for goods and services (largely) exceeds the value and amount of current output at prevailing prices, a general price inflation will bring them back into line. First, prices of consumer goods will rise, thereby bringing about a cut in the real income of the retired. Second, the elderly will see the prices of the securities they wish to sell to the younger age groups decreasing and thereby their claims on real goods and services. This means a further cut in their real purchasing power. On the other hand, under a pay-as-you-go scheme contributions will be lowered when a readjustment seems to be inevitable and consequently the real income of the pensioners will decrease proportionately. As a result under both pension finance systems a new equilibrium will develop at a lower level of income and consumption of the retired. Both pension finance systems then appear not to be immune against aging.

One may wonder which type of redressing is preferable, the price-adjustment mechanism (led by an invisible hand) under funding or the (democratic?) decision-making process in respect of tax and contribution levels when a pay-as-you-go system is at work.

Under given circumstances only the (well-organized) state, up to a certain pension income level, can offer a reasonably complete guarantee against inflation, e.g. by issuing indexed bonds or from general tax revenues, although this solution is artificial and has its own disadvantages. When this gloomy world is reality the preferred policy will be to let people work longer, often part-time and at a lower rate of pay. Pre-pension payments as an income supplement, if society can afford them, can be desirable or necessary till the (higher) statutory retirement age.

Apart from the ultimate risks, of which inflation is the most dangerous, it may be concluded that financial claims in the case of funded schemes generally can be considered to be undeniably stronger than claims in the case of unfunded schemes. Full funding of pensions therefore seems to be the more attractive and secure option in an aging society. Thus, funding can be considered as the best way of strengthening security.

Not having children

For demographers in particular it is interesting to note that it can be argued that the present baby-boom generation has caused the old-age pension probem by not having children, thus by not having invested in human capital. In order for a pay-as-you-go system to function properly and to survive, each generation has to perform two tasks. It has to pay the old-age pensions of the elderly and it has to pay for the upbringing of its children.[17] Since the baby-boomers have chosen not to raise as many children as previous generations did, a moral-hazard effect of the introduction of any pension system, they should now be asked to use the expenditures saved by not raising children for financing investment in material capital goods rather than increasing their consumption. Thus, by capital deepening up to a certain extent, the production of a sufficiently large future national income can be secured. Moreover, those generations by paying extra contributions are not worse off than they would otherwise have been with an unchanged population under a pay-as-you-go system.

[17] Sinn (1998). Note however that under a funded pension system a sufficiently large well-equipped future labour force is of equal relevance. Generations which renounce their duties to raising children will be confronted with low pension asset prices when old.

6. Some further observations

It is often said that the main risk of pay-as-you-go in pension financing is of a demographic character, whereas the major risks involved in funding are inflationary tendencies. This, however, is not the whole story. The pension burden can be far from heavy or even light in a prospering economy even when there are adverse demographic developments. On the other hand, there may be recessive economic developments with a young population. Similarly, the economy may prosper in an inflationary environment, which enables companies and contribution-payers to pay for additional pension contributions, compensating for less-than-expected capital returns. Otherwise, as experience in the last decades has demonstrated conclusively, rather high capital returns may be accompanied by a recessive economy.

The public-versus-private issue

Generally funded schemes are identified as being private and pay-as-you-go schemes as public. A preference for funding as an adequate instrument to cope with the aging problem can easily be transformed into a more general preference for private pensions and being part of a wider argument for privatization and less interference of politics and government with pension providers in a commercial market. Thompson (1988, p. 67): "... people with less taste for redistribution will be more likely to favour private-sector approaches, and those who favour private-sector approaches may do so, precisely because they prefer less distribution."

Expanding supplementary pension plans and personal pension schemes is strongly advocated by, for example, the IBRD (World Bank) (1994). Note that public schemes are not necessarily restrained to pay-as-you-go. Hence, the public-versus-private issue should not be confused with the debate on pay-as-you-go versus funding. The objective to increase national saving by a higher degree of funding in pension finance can be achieved with either publicly or privately managed pension funds.

Globalization of the economy is another argument in favour of further privatization of pension schemes and more flexibility. For pensions to become more flexible and portable, they should first be converted from a pay-as-you-go to a funded scheme and secondly from the defined benefit form to the defined contribution form.

Shift from pay-as-you-go to funding

Though it can not be shown unambiguously that funding favours national saving and economic growth, the momentum for a (partial) shift from pay-as-you-go to funding and more emphasis on capital reserve remains. Proposals for funding often primarily intend to reduce the size of intergenerational redistribution. The debate concerning pay-as-you-go versus funding should (also) not be confused with the issue of solidarity or intra- and intergenerational redistribution.

A (partial) shift from pay-as-you-go to funding of the national basic pension plans is not without problems as there are major transitional losses involved. The generations living during the transitional period have to pay, in terms of reduced consumption, for the pensions of the preceding generations (under pay-as-you-go), while paying, in terms of savings or

reduced consumption, for their own pensions' underfunding.[18] A conversion from pay-as-you-go to funding therefore cannot be realized in a Pareto-optimal way without extra costs involved for at least one generation. Thus, once a pay-as-you-go system has been introduced, it is often argued, practically speaking all generations are captured or "locked in", even when the funding system generates the necessary savings for sustained economic growth.

But the transition burden should not be dramatized. In the case of Germany it is shown by Börsch-Supan (1997) that the transition burden is about 4 per cent of average household income, relatively moderate and far from a "double burden". In the second place, workers in turn obtain property rights of capital goods, yielding investment revenues, for reduced consumption. Furthermore, the working of the labour market can be improved as distortions in the labour supply are removed. As a result labour supply increases, which in turn reduces the wage level and heightens the return on the domestic capital stock. This makes possible a Pareto-efficient transition to a funded system.[19] A large potential for Pareto-improvement can also be achieved when pension institutions invest in higher-yielding assets than government debt, whereas the legislated pay-as-you-go-based pension promises are transformed in public debt that earn the market rate of return.[20]

Hence, we may find ourselves in a Pareto-efficient world, which can still be worse than many other possible worlds. We may wish therefore to go beyond that Pareto-efficient world, considering states of the world that originate from economic and pension policies of a different kind generating more gains for all future generations and a loss for one current generation.

In the (most fully) funded strategy all pension payments and the further accumulation of pension capital are financed from the returns on capital, as opposed to a full pay-as-you-go system in which all pension payments are financed by the current working population.

It can be necessary to resist political majorities that insist on maintaining pay-as-you-go systems as funding is preferable in the long term. It is likely that there will be some need for curtailing of the pension provisions in the future and maybe even of those nearing retirement today.

Investing domestically or abroad

Finally we turn to the possibilities of using assets abroad, particularly publicly owned foreign currency and foreign currency owned by pension funds, insurance companies and individual citizens, to alleviate the burden of the retirement income system. In principle, a

---

[18] The present working population and the future leading-edge working population presumably as well have chosen not to raise as many children as previous generations did. They can be asked therefore, it is argued, to use the expenditures saved by not raising children for financing the transitional costs of the shift from pay-as-you-go to funding rather than increasing their consumption. They are not worse off than they otherwise would have been with an unchanged development of the population (under a pay-as-you-go system). After the transition, future generations under funding pay pension contributions that, *ceteris paribus*, mainly depend on the real rate of return on capital and not on the number of children they have. Though less future labour supply will increase the wage rate and lower capital returns. See for the transition from pay-as-you-go to funding, e.g. various contributions in Siebert (1998) and Disney (2000).

[19] See, for example, Broer and Westerhout (1996). Note, however, that no Pareto-improving transition is possible if individual pension benefits are proportional to individual contributions, which happens to be the case in Germany, for example, but not in the the Netherlands (cf. Fenge, 1995).

[20] Cf. Valdés-Prieto (1997).

society can be a net lender on the international capital markets during the working period of the baby-boom cohorts and liquidate its foreign investments during those cohorts' retirement years. Or, in present circumstances, a society can run a current-account surplus now and a current-account deficit during its aging period.[21] Total income available in future years will be increased. Consumption of imported goods can then be augmented if we invest abroad, and consumption of domestically produced goods can be increased if the rate of domestic investments has risen. See for critical comments Koopmans (note 9) as what is true on aggregate will not hold on a micro-level.

A policy of higher savings and investment as observed can be helpful in offsetting some of the future burden of population aging. The extra savings can be invested in the public or private sector, [22] domestically or abroad. The distributional consequences of the two latter alternatives differ. Investing in the domestic sector drives down rates of return on capital due to a higher capital intensity. On the other hand wage rates will rise as a result of higher labour productivity. Furthermore, labour supply may be too small to absorb the larger capital stock. If all or most of the extra savings flow abroad, the domestic rate of return on capital will not decline as much, but the domestic labour force will not receive then the productivity gains that it otherwise would have had. Instead, foreign workers will enjoy higher wages as a result of a capital deepening of their economies.

Furthermore, funding opens a global dimension of diversifying risks by the globalization of capital markets, which is unavailable in a pay-as-you-go system.[23]

---

[21] Increased investment abroad may alleviate the aging problem in the "western" developed countries. Note, however, that virtually all the major (and smaller) developed countries will have the same problem in nearly the same time period ahead. The aging "western" world as a whole has only a rather small foreign sector. Or, in other words, not all societies can play the same game at the same time. Japan, for instance, has during the last few decades invested its current-account surpluses abroad, to a large extent however in countries which also face an aging problem. Realizing overseas assets, Japan, on a macro-level, may probably solve at least in part its aging problem but at the expense of making the problem of those other countries worse. Remember the world as "one global village".

[22] Contrary to often-heard arguments, it is of less relevance to the performance of the economy whether the (public) pension capital is invested in public or private (corporate) assets. If a public pension fund invests in government bonds, then from the point of view of the consolidated collective sector (government and social security institutions together) funding and pay-as-you-go are similar, so the argument goes, as future interest payments to the fund have to be financed from general tax revenues. Note, however, that, if the pension fund purchases government debt, a larger proportion of households' savings can be used to finance investments in the private sector. And otherwise, if the pension funds' savings are instead invested in private debt and equities, a larger part of households' savings can be used to meet public demand for capital. Or, in other words, in both cases higher savings associated with pension funding will lead to a higher demand for corporate debt and public debt, which in turn induces at least in part increased investment and a larger supply of real assets. Note also that the total of savings of all national sectors minus total investments in all sectors equals the surplus (+)/deficit (−) on the current account of the balance of payments. In The Netherlands in 1990s about 20 per cent of the current account surplus can be explained from additional (i.e. due to the demographic imbalance) pension savings and this percentage will increase markedly in the coming decades (Bikker, 1996).

[23] Increased international portfolio diversification can have two opposite effects. First it allegedly increases the potential for risk reduction. Second, growing integration of worldwide financial markets induces higher correlations of capital returns across different geographical areas and thereby reduces the potential for risk reduction. Cragg (1998) tries to answer the question where people from the developed world could invest. Not surprisingly he recommends that investors should switch their funds from OECD to non-OECD countries, as the latter countries experience an increase or only a minimal decline in the size of the workforce in the first half of the 21st century. As opposed to what the cover of the book wants us to believe, (detailed) survival guidelines are not given, however.

7. Summarizing and concluding remarks

A fundamental question remains of how developed countries will cope with their greying future. About 15 per cent of their citizens are now aged 65 and over. By 2030 the proportion of people over 65 years of age will have increased to 23 to 25 per cent, most of them women. Germany, Italy, Switzerland and with some delay, the Netherlands, are the most aging countries; only in Ireland will the elderly make up some 17 per cent of the population in 2030. Similar information is obtained from projections of the dependency ratio, generally defined as the population aged 65 and older as a proportion of those aged 20 to 64.

Whatever transfer mechanism is used, an increasing proportion of national product in the coming decades will be needed to provide for the basic public pensions and supplementary pensions to the elderly, but above all for increased health care.[24] The higher the national product and economic growth are, the easier it will be to ensure that making one group better off does not imply another group worse off. A larger economic pie will provide everyone with a bigger slice. This is crucial to solve the distributional problems in respect of aging adquately. Note also that the economies of many countries now operating far below full employment can alleviate significantly any transfer problem in respect of aging by increasing the labour-force participation, thereby increasing national productive capacity.

As observed, an uninterrupted process of economic growth is the best guarantee that the income distribution problem among the different (age) groups of population will be solved comfortably. The major challenge for the economic performance of the western countries will not be a shortage of savings and corresponding investments due to the aging of their populations. Most western countries have unprecedented large capital stocks. A slower rate of capital accumulation is not the real issue, rather a serious shortage of skilled labour may arise.[25]

If unfortunately at any future point of time in the 21st century a serious controversy arises between generations, if the aging time bomb actually explodes, a persistent inflationary process will effectively contribute to its solution by reducing the (real) share of national resources being transferred to the retired population.

The aging process nonetheless may impose an increasing strain on public finance at a time of reduced growth or actual decline in the labour force, leading to substantial budgetary deficits. Combined with the adverse effects of a declining (and aging working) population on productivity growth, public finance may be further under pressure. Note however that empirical evidence is not conclusive about these allegedly adverse effects.

It seems likely, therefore, that future problems, if any, will not arise from the size of national product, but from the vulnerability of the distributional mechanism that heavily relies on the public budget in most western countries. Capital income arising from the (private

---

[24] Fiscal implications arise in all those countries where health care is predominantly publicly financed. Note that the financing of health care can to a large extent be viewed as similar to pension financing as the major part of health services is consumed during old age.

[25] Blake (1996) is extremely pessimistic on this matter. He notices a "significant minority problem" as he expects that the absorption and integration of minority cultures into that of the host population will not work. As a result standards in education and standards of civil behaviour will fall. "Thus, if Europe's next generation is not able to achieve stable and productive long-term employment in a stable social and political environment, the future looks grim for both it and the current generation as it enters retirement. However, relative to the rest of the world, Europe's economic prospects are the worst that they have ever been in the continent's history. We could be seeing the beginning of the end of European Economic Man, and, if that is the case, the author does not give much for the value of his pension in the future either!"

property of the) capital stock provides a better safeguard against the political and economic vicissitudes than promises made under pay-as-you-go systems. The same holds for (more) income from labour activities of the elderly. As a result the problems posed on public finance will be considerably alleviated.

It can not be shown unambiguously that funding always makes a real economic difference; certainly it makes a psychological difference. By funding generations anticipate future demographic and economic developments and their anticipatory behaviour (probably) is not primarily dependent on present macro-economic relationships, on whether the Aaron-rule holds and so forth. In almost all worlds, funding therefore can be considered as the best instrument to secure pension entitlements and for solving and controlling the distributional problem in respect of pension incomes in an aging society. The claim of the elderly on future national product is best guaranteed under funding, arising from the ownership of part of the capital stock.

The basic issue in pension programming, irrespective of whether it is funded or pay-as-you-go financed, is the availability of real resources that finance the consumption of goods and services of people in their old age. There is a pension problem when there is a short-fall in those real resources and conversely.

After years of controversy and debate over "funding versus pay-as-you-go" at a theoretical and practical level, the question can be asked, what remains of the debate? Without doubt the debate has lost much of its heat as the characteristics of both systems, the merits and demerits, the similarities and dissimilarities are made clearer now and are better understood.

REFERENCES

BARR, N., 1998, *The Economics of the Welfare State*, 3rd edn. London: Weidenfeld & Nicolson, Stanford: Stanford University Press.

BIKKER, J.A., 1996, "National savings, the current account and aging population: a pension fund model", *Economic and Financial Modelling*, 3, pp. 3–20.

BLAKE, D., 1996, "On the long-term risks facing pension schemes and pension funds in Europe", *Journal of Pensions Management*, 1, pp. 225–244.

BÖRSCH-SUPAN, A., 1996, "The impact of population aging on savings, investment and growth", in OECD (1996).

BÖRSCH-SUPAN, A., 1997, *Germany: A Social Security System on the Verge of Collapse*. Arbeitspapier 97/023. Mannheim: Universität Mannheim.

BOS, E., VU, M.T., MASSIAH, E. and BULATO, R.A., 1994, *World Population Projections 1994–95*. Washington D.C.: World Bank.

BROER, D.P. and WESTERHOUT, E.W.M.T., 1996, "Pension policies and lifetime uncertainty in an applied general equilibrium model", in Broer, D.P and Lassila, J. (eds.), *Pension Policies and Public Debt in Dynamic CGE Models*, Helsinki: Physica Verlag.

CRAGG, R., 1998, *The Demographic Investor; Strategies for Surviving the Pension Crisis*. London: Financial Times–Pitman.

CUTLER, D.M., POTERBA, J.M. SHEINER, L.M. and SUMMERS L.H, 1990, "An aging society: opportunity or challenge?", *Brookings Papers on Economic Activity*, 1, pp. 1–73.

DIAMOND, P.A., 1997, "Insulation of pensions from political risk", in Valdés-Prieto, S. (ed.), *The Economics of Pensions, Principles, Policies, and International Experience*. Cambridge: Cambridge University Press.

DISNEY, R., 1996, *Can We Afford to Grow Older; A Perspective on the Economics of Aging*. Cambridge, MA: MIT Press.

DISNEY, R., 2000, Crises in public pension programmes in OECD: what are the reform options?, *The Economic Journal*, 110, pp. 1–23.

FENGE, R., 1995, "Pareto-efficiency of the pay-as-you-go pension system with intregenerational fairness", *Finanzarchiv*, 52, pp. 357–363.

GROUP OF TEN, 1998, *The Macroeconomic and Financial Implications of Ageing Populations*. Basle: Bank for International Settlements.

IBRD (WORLD BANK), 1994, *Averting the Old-Age Crisis; Policies to Protect the Old and Promote Growth*. Oxford: Oxford University Press.

IMF, (1996), see S. K. Chand and A. Jaeger.

JACKSON, W.A., 1998, *The Political Economy of Population Aging.* Cheltenham: Edward Elgar.

KOOPMANS, L., 1992, "Financiering en macro-economische aspecten van het ver-grijzingsvraagstuk; een internationale uitweg?, (Pension finance and the macroeconomic impact of population aging; an international escape?), in Bartel, J.C.K.W. *et al*. (eds.) *Wetenschap, Management en Ondernemershap*. Leiden: Stenfert Kroese, pp. 429–438.

KUNÉ, J.B., 2000, *Issues in Pension Finance*, The Hague: Netherlands Foundation for Pension Studies.

LUTZ, W. (ed.), 1994, *The Future Population of the World, What Can We Assume Today*? London: IIASA/Earthscan, Earthscan Publications Ltd.

MASSON, P.R. and TRYON, R.W., 1990, "Macroeconomic effects of projected population ageing in industrial countries", *IMF Staff Papers*, 37, pp. 453–485.

MACMANUS, S.A., 1996, *Young v. Old, Generational Combat in the 21st Century.* Boulder, Colo.: Westview Press.

MILES, D. and PATEL, B., 1996, "Saving and wealth accumulation in Europe, the outlook into the next century", Merill Lynch Financial Research.

OECD, 1996, *Ageing in OECD Countries, a Critical Policy Challenge*. Paris.

OECD, 1998, *Maintaining Prosperity in an Ageing Society.* Paris.

REYNAUD, E., 1995, "Financing retirement pensions: pay-as-you-go and funded schemes in the European Union", *International Social Security Review*, 48, 3/4, pp. 41–58.

SIEBERT, H. (ed.), 1998, *Redesigning Social Security.* Tübingen: Mohr Siebeck.

THOMPSON, L.H., 1988, "Altering the public/private mix of retirement incomes", in Wachter, S.M. (ed.), *Social Security and Private Pensions*. Massachusetts: Lexington Books.

VALDÉS-PRIETO, S., 1997, "Financing a pension reform towards private funded pension", in Valdés-Prieto, S. (ed.) *The Economics of Pensions, Principles, Policies and International Experience*. Cambridge: Cambridge University Press.