CHAPTER 2

THE ANATOMY OF THE PENSIONS "CRISIS"

John Eatwell

2.1 Introduction

An individual's standard of living is sustained by a flow of goods and services, including the services of capital investments such as houses. There are two ways to secure that flow after retirement.[151]

The first is to actually store the goods and services themselves, like a squirrel hiding its nuts. The young could put aside goods and, where possible, invest in the capital goods that will directly yield needed services, and then consume them in old age. This is a very inefficient strategy, indeed for many goods and most services it is impossible. Apart from the excessive costs of storage (especially of perishable goods) over time many commodities become outdated and even useless, and many services, such as medical and care services, cannot be stored at all.

So the second approach predominates. Living standards are secured in retirement by acquiring monetary claims that can be used to purchase part of the contemporaneous flow of goods and services produced by the current workforce. The pensions problem is to ensure that retired people have a sufficient number of monetary claims to buy the goods and services they need, and to secure the agreement (tacit or implicit) of the workforce to "give up" the goods and services they have produced.

Under any circumstances, ensuring that all the elderly have sufficient monetary claims to sustain a minimal decent standard of living is a major issue of economic policy. A large intergenerational transfer inevitably poses complex social and economic issues. The authorities have a direct interest in ensuring adequate provision, for whether the transfer is made by the public sector or via private sector financial institutions, if pensioners do not have enough to live on the state will need to provide some form of back-up social security.

The problem of how the intergenerational transfer is to be made becomes significantly more difficult when the population is ageing, i.e. when the proportion of the population that has retired is rising due to falling birth rates and increased longevity. It is the ageing of the population in many countries over the next several decades which lies behind today's pensions "crisis". As will be demonstrated below, that crisis is a general phenomenon, independent of how pensions are financed. But it has typically been portrayed as a crisis of state pension systems, as is the case in table 2.1.1.

In table 2.1.1 the first line for each country expresses the proportion of GDP which will be absorbed by state pensions should they be paid at the rates currently planned, in other words, should states not default on their commitments. In all the countries shown, a sharp increase is projected between 1984 and 2040. Thereafter the proportion should decline as the population assumes a balance associated with the lower birth rate. The second line for each country is an index of real value of state pensions per head of the *working-age* population. In Germany, for example, the burden on a member of the working-age population is expected to increase by 54 per cent between 1980 and 2040. A similar increase in burden will occur in Japan. There will be a very large increase in the Netherlands and a large increase in the United States. The only country which does not suffer such a large increase is the United Kingdom. This is because over the past two decades the British government has reduced the rate of increase in the real value of state pensions (in effect the state has defaulted on the real value of pensions which were expected by present state pensioners when they made their plans for retirement 30 or 40 years ago). Nonetheless, even in the United Kingdom, the ageing of the population results in a 10 per cent increase in the burden on the working population.

The issues raised by difficulties confronting state pension systems are not confined to the public sector, they are quite general. These difficulties can be highlighted by means of a simple model. In this model pensioners will be treated as the only dependent group in the population, leaving out of consideration the young and the sick. Some attention will be given to the proportion of the population of working age who are not in the workforce (those performing unpaid work in the household, the unemployed and so on). But predominantly pensioners will be the only dependent group taken into account. It will also be

[151] N. Barr, *The Economics of the Welfare State*, second edition (Oxford, Oxford University Press, 1993) and "Retirement pensions", in N. Barr and D. Whynes (eds.), *Current Issues in the Economics of Welfare* (London, Macmillan, 1993).

TABLE 2.1.1

Demographic effects on the share of state pensions in GDP and the financing burden, 1984-2040

(Percentage change over preceding year)

	1984	2000	2020	2040
Germany				
Pensions as per cent of GDP ..	13.7	16.4	21.6	31.1
Burden (1980=100)	100	106	124	154
Japan				
Pensions as per cent of GDP ..	6.0	9.4	14.0	15.7
Burden (1980=100)	100	115	142	154
Netherlands				
Pensions as per cent of GDP ..	12.1	13.4	19.6	28.5
Burden (1980=100)	100	100	114	139
United Kingdom				
Pensions as per cent of GDP ..	7.7	7.5	8.6	11.2
Burden (1980=100)	100	93	101	111
United States				
Pensions as per cent of GDP ..	8.1	8.2	11.3	14.6
Burden (1980=100)	100	96	117	131

Source: OECD, *Ageing Populations: The Social Policy Implications* (Paris), 1988.

Note: Burden is defined as the real value of pensions per head of population in the age group 15-64. The German figures are for west Germany.

assumed that all savings and taxes are directed toward providing for the flow of goods and services to pensioners. Other uses of savings and taxes will be ignored, though clearly there could be a redirection of savings and taxes toward meeting the needs of pensioners.

Consider the following relationship:

$$PN = (S + T)YW \quad \ldots (1)$$

where P is the average pension per head per year and N is the number of pensioners. So PN is the total amount of the pensions paid every year. Those pensions are a flow of purchasing power which will be used to buy the goods and services which have been produced by the working population. On the right-hand side W is the working population, Y is value of output per head, or productivity, of the working population. Hence WY is the total value of the flow of goods and services. S is the average savings rate and T is the average tax rate. These savings and taxes are the means of extracting from the working population the goods and services which the pensioners require – the proportion of the output of the working population which they themselves do not consume. So, on the left-hand side is the amount of goods and services going to pensioners and on the right-hand side the amount of goods and services being produced and released by the working population. This intergenerational transfer is the central relationship in any pensions calculation.

Rearrangement of equation (1) yields:

$$N/W = RY/P \quad \ldots (2)$$

the ratio of the pensioner population to the workforce is equal to the ratio of income not consumed to the average pension ($R = S + T$).

Equations (3) and (4) express the same core relationship in terms of growth rates:

$$n - w = r + y - p \quad \ldots (3)$$

$$r = sa + t(1 - a) \quad \ldots (4)$$

where lower case letters indicate rates of change. So n is the rate of growth of the pensioner population, w is the rate of growth of the workforce, y is the rate of growth of productivity, p is the rate of increase in the real value of the average pension and r is a weighted average of the rates of growth of taxes, t, and of the savings rate, s, as defined in equation (4), $a = S/(S + T)$.

The source of the pensions crisis is that n is greater than w, the pensioner population is growing more rapidly then the workforce. So the left-hand side of (3) is positive and the right-hand side must be positive too. This can be achieved by an increased value of r, increasing savings or taxes, or by a higher rate of productivity growth y, or by a lower value (even a negative value) for p, that is a decline in the growth rate of the real value of the average pension. An increase in r could also be achieved by a change in a, i.e. a change in the balance between savings and taxation. Since savings ratios are typically significantly lower than tax ratios this would suggest an increase in taxation as a means of reducing the consumption of the workforce.

A further factor which should be taken into account is the possibility of increasing w, the rate of growth of the workforce. This could be done both by reducing the unemployment rate, and by increasing the participation rate of all those of working age. Or it might be done by raising the age of retirement, thus increasing the proportion of the population deemed to be of working age. This will have the effect of both raising w and lowering n. This may be particularly important in the transition economies of central and eastern Europe where retirement ages are comparatively low. More hypothetically w could be raised by lowering the age at which young people enter the workforce. Of course some of these increases are once and for all, and so would not result in a permanent rebalancing of equation (3).

A solution to the crisis therefore rests on determining which of the values of w, r, y or p are to be changed. Given the increase in the value of n, an appropriate combination of them *must*, of necessity, be changed, either by policy or by default. Much of the attention in considerations of the pensions crisis has been focused on the relationship between the manner in which pensions are financed and equation (3). It

should, therefore, be noted that the same issues will arise however pensions are financed. The debate over financing should be conducted in the light of impact of different financial arrangements on *w*, *r*, *y* or *p*.

2.2 Financing pensions

The increase in the ratio of the pensioner population to the workforce has initiated a debate over the manner in which pensions are financed. In its most stark form this has been a debate between, on the one hand, pay-as-you-go (PAYG) pensions and, on the other hand, fully-funded (FF) pensions.

A PAYG pension scheme is a public sector scheme in which taxes are raised in order to fund the transfer of purchasing power to pensioners. The right to receive a pension is essentially a political right, the terms of which are guaranteed by the state – though this is not to say that the state might not subsequently alter the terms on which pensions are offered. The transfer of goods and services from the workforce to the pensioners is very transparent.

An FF pension scheme may be run by the public sector, though typically these are private sector schemes. Under an FF scheme an individual saves in his or her lifetime and thus acquires a stock of financial assets which may be used in the future to buy the goods and services required, either by cashing in the assets or by buying an annuity from an insurance company. The right to receive a pension is a financial right, owned by the individual – though the value of that right will depend on a wide variety of economic circumstances, such as the state of the markets for financial assets, interest rates and the rate of inflation.

An important preliminary point to make which is fundamental to the entire debate on pensions is that in overall macroeconomic terms there is no difference between these two schemes as regard the overall transfer, i.e. in their impact on *r*. For given values of *n*, *w*, *y* and *p*, the value of *r* must be the same whatever the financing scheme. In a PAYG scheme current taxes are being used to pay current pensions. In an FF scheme it is current savings which are being used to pay current pensions. Savings today are funding the pensions of today. Accordingly, the "burden" on the workforce, defined as the goods and services that are "extracted" from the income of the workforce is exactly the same whether the nation's pension scheme is FF or PAYG.

A further similarity is that just as the workforce may resist increases in taxation, so they may also resist the attempt to reduce their consumption via an FF scheme. Suppose that instead of PAYG pension schemes, Germany and the United States funded pensions by means of FF schemes. The increased burden associated with the ageing of the population would be created by the large aggregate of financial claims accumulated by the growing number of retired persons. These claims would then need to be met by increased saving. The pensioners would use their monetary claims to extract the resources from the workforce. If the workforce was unwilling to effect this reduction in their real consumption by increasing their savings, then prices would be bid up. The acceleration in the rate of inflation would continue until either the real value of pensions was reduced to a level which the workforce was willing to accept, or the workforce increased their savings rate in order to sustain the real value of their own accumulating stock of financial claims. If the workforce refuses to reduce their consumption, either by refusing to pay higher taxes, or by refusing to save more, then pensions must be cut (*p* must be lowered). In the case of an FF scheme the process is less transparent than under a PAYG scheme. But in macroeconomic terms, the outcome is exactly the same.

The comparison between PAYG and FF pensions should therefore be made in terms of characteristics other than their overall macroeconomic impact. Some of the major advantages and disadvantages of PAYG schemes are set out in table 2.2.1.

The simplicity and transparency of PAYG pensions is self-evident. Money raised by taxation is transferred to pensioners. This simple procedure has extremely low administration costs compared to FF pensions. Major public PAYG schemes typically have administration costs of around 3 to 4 per cent, whereas privately managed FF pensions typically have administration costs of around 20 per cent. PAYG pensions also tend to be relatively egalitarian. Whereas FF schemes tend *at best* to reproduce in retirement the distribution of income of the workforce, PAYG schemes tend to have a less highly skewed distribution. One of the major problems of FF pensions is that poor people do not have the wherewithal to save and, therefore, tend to have no pension at all, in which case the state must make some sort of social security provision out of taxation. PAYG schemes also have a very wide coverage, usually the whole population is covered. Nor is there any inhibition to the flexibility of the labour market, because PAYG pensions are not associated with tenure of a particular job. There is relatively low risk with PAYG schemes, though there does exist the possibility that a government may default on its commitments.

The major disadvantage of a PAYG scheme is the perceived budgetary burden, and the resistance to raising necessary funds via taxation. An associated problem is that there may be an over-commitment to a specific level of pensions. If the rate of growth of the economy is lower than expected (*y* is lower than was expected at the time the pension scheme was established) then it may be necessary to reduce *p*, the rate of growth of pensions. This can create severe political difficulties. A further problem with public sector PAYG schemes is that pensioners may lack choices as to the particular pensions package that suits their needs.

Table 2.2.1

Advantages and disadvantages of pay-as-you-go (PAYG) pensions

Advantages
Simplicity and transparency
Low administration costs
Progressive redistribution
Wide coverage
Do not inhibit the mobility of labour
Low risk
Disadvantages
Budgetary burden
No "choice"
Over-commitment to a specific level of pensions
Resistance to tax funding

Table 2.2.2

Advantages and disadvantages of fully-funded (FF) pensions

Advantages
Higher returns from professional equity investment
Saver has independence and choice
Increases savings and growth
Promotes the development of financial markets, and effective corporate governance
Automatically adjusts the level of pension to available returns
Disadvantages
Regressive impact on the distribution of income
High administration costs
Limited coverage
Uncertain return (high risk)
Need for a social security safety net
In some cases limit mobility of labour (occupational pensions)

The major advantages and disadvantages associated with FF schemes are set out in table 2.2.2.

FF schemes, particularly private sector FF schemes are said to enjoy the advantage of high returns from professional equity investment. This has been a particularly popular argument given the rate of growth of stock market prices over recent years. What this suggests is that for FF pension holders p will be higher than might have been expected. From equation (3) other variables will need to adjust, i.e. r or y must increase. Or it may be the case that some pensioners enjoy higher pensions while others do not and that the average value of p is unchanged. With private FF schemes the saver has independence and choice. Savers may have the feeling of "owning" their own pension fund (even though this does not guarantee a higher pension than under other arrangements). It is also claimed that FF schemes increase savings and growth for the whole economy and promote the development of financial markets. Perhaps the greatest advantage of FF schemes is that there is an automatic adjustment of the level of pensions to the available resources. If available resources are lower than expected then either equity returns are also lower than expected or the real value of financial claims are reduced by inflation. Both processes operate "automatically". Pensioners may be disappointed in the real value of their pensions. But they do not perceive any deliberate political decision in the reduction of their pensions by inflation or by the failure to attain a suitable return in the financial markets.

The major disadvantages of FF pension schemes are their regressive impact on the distribution of pensioner income and their high administration costs. Also FF schemes typically do not cover the whole population. The return on FF schemes is uncertain in that it depends on the performance of the stock market and on the level of interest rates on retirement (which determine the return on any purchased annuity). There is a need for a social security safety net to cover those whose pension provision is below a minimum value and for those who have no pension at all. In the case of funded occupational pensions schemes there is a limitation on the flexibility of the labour market.

Pensions, savings and growth

The consideration of this question necessarily involves the subject of the promotion of the development of financial markets and of effective corporate governance.

Given the rather weighty disadvantages of FF schemes, it is important to consider the advantages claimed for them, particularly insofar as this particular method of financing pensions is believed to have an impact on the real performance of the economy, i.e. on y in equation (3).

A fundamental determinant of the real value of pensions is macroeconomic performance. If FF pensions do result in higher rates of savings and growth, as compared with PAYG schemes, then the overall impact is likely to be beneficial, certainly to the "average" pensioner. What matters for the overall level of pensions in the future is whether the economy grows rapidly or not, not whether there is some particular segment of society that benefits.

There has been a good deal of controversy over the question of the impact of different pension arrangements on real investment rates and hence on the scale of future income flows. This controversy is unresolved. Feldstein[152] argued that PAYG schemes could reduce aggregate savings and investment. However, his work was shown to suffer from serious statistical flaws,[153] and no clear-cut conclusion can be drawn.

It is sometimes argued that because FF schemes are more likely to be invested in foreign assets they will increase the future growth of national income. However,

[152] M. Feldstein, "Social security, induced retirement and aggregate capital formation", *Journal of Political Economy*, Vol. 82, No. 5, 1974.

[153] D. Leimer and S. Lesnoy, "Social security and private saving: new time series evidence", *Journal of Political Economy*, Vol. 90, No. 3, 1982.

this argument is incorrect. Net foreign investment is equal to the balance of net domestic savings (public and private). If *r* is of a given value relative to domestic investment, then the value of net foreign investment will be the same whether the pensions are PAYG or FF.

Nor is it clear that the development of the financial infrastructure associated with FF schemes results in a better allocation of savings, or improved flows of funding to industry.[154] Virtually all new funds required for corporate investment are derived from retained profits rather than from the investment of new savings. For example, in 1998 American companies financed *over* 100 per cent of their investment by retained profits, and no new net funds were raised from the financial markets. The figure was *over* 100 per cent because of the prevalence of share buy-back schemes. Similar results may be found for the United Kingdom economy.

The relationship between structures of corporate governance, the development of stock markets and economic performance is also very controversial. It is not possible on the basis of the available evidence to argue definitively for the superiority of stock market-based governance structures over bank-based governance structures,[155] or for the efficiency of the takeover mechanisms which liquid stock markets promote.[156] Nor is it possible to argue that development of international financial markets, in which institutional investors, including pension funds, have played a major role, have resulted in an unambiguous improvement in economic performance.[157]

So while it may be possible to argue that the existence of FF pension schemes promotes the development of financial markets, there is no clear relationship between the growth of financial markets and aggregate savings, growth or economic efficiency.

2.3 The pensions crisis

Given the uncertainties surrounding the impact of different funding schemes on the performance of the economy, the debate comes down to the question of the relative efficiency of PAYG and FF schemes as means of intergenerational transfer, given the performance of the real economy.

The pensions crisis has typically been associated with public PAYG pension schemes, and a common reaction has been to propose a switch to some version of FF schemes. An influential OECD study argued:

> "It is clear that if present [public] pension payments are left untouched, the pension schemes in some countries would impose major burdens on their societies in the next century, either through requiring higher taxation or other spending cuts, or by rapidly increasing public debt burdens resulting from high primary deficits, compounded by explosive debt dynamics."[158]

But this argument applies just as much to FF schemes, *so long as the level of pension provision is unchanged.* While in many ways FF pensions are significantly less efficient than PAYG pension schemes, they have the considerable political virtue of reducing the real value of pensions *automatically* to the available resources, i.e. without overt political decision. In the face of the pensions crisis they are a device for cutting the rate of growth of average per capita pensions.

However, equation (3) suggests that other measures might be taken which would limit the need to cut pensions. Assuming that *n* is given, the left-hand side of (3) could be reduced by measures to increase the rate of growth of the working population, to extend the length of working life, to encourage a higher rate of labour force participation, perhaps by enabling more women to enter the labour force, or to import labour from areas which have labour surpluses. It is also important to pursue policies which secure the lowest possible rate of unemployment.

With respect to the right-hand side of (3) a variety of measures could be implemented to increase *r* by the introduction of attractive schemes which encourage savings, or perhaps by linking taxes directly to future pension benefits. Steps can also be taken to increase productivity, *y*, by increasing the rate of investment or by improving the quality of the labour force by investing in education and training. Without such measures the only remaining possibility is a cut in *p*.

Whatever system of the provision of pensions is used, there will remain the necessity of transferring a given amount of real resources from the working

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[154] J.-J. Rosa (ed.), *The World Crisis in Social Security* (San Francisco, Institute for Contemporary Studies, 1982); World Bank, *Averting the Old Age Crisis: Policies to Protect the Old and Promote Growth* (New York, Oxford University Press, 1994); A. Singh, "Pension reform, the stock market, capital formation and economic growth: a critical commentary on the World Bank's proposals", mimeo (Cambridge), 1995.

[155] C. Mayer, "Financial systems, corporate finance and economic development", in G. Hubbard (ed.), *Asymmetric Information, Corporate Finance and Investment* (Chicago, University of Chicago Press, 1990).

[156] A. Hughes and A. Singh, "Takeovers and the stock market", *Contributions to Political Economy*, Vol. 6, 1987; M. Jensen, "Takeovers: their causes and consequences", *Journal of Economic Perspectives*, 1988; M. Warshawsky, "Determinants of corporate merger activity: a review of the literature", *Staff Study*, No. 152, Board of Governors of the Federal Reserve System (Washington, D.C.), 1987; A. Singh, "Corporate takeovers", in P. Newman, M. Milgate and J. Eatwell (eds.), *The New Palgrave Dictionary of Money and Finance* (London, Macmillan, 1992).

[157] J. Eatwell, *International Financial Liberalisation: The Impact on World Development*, ODS Discussion Paper Series, No. 12, UNDP (New York), 1997; also published (in English) in *Estudios de Economía*, 1997.

[158] W. Liebfritz, D. Roseveare, D. Fore and E. Wurzel, *Ageing Populations, Pension Schemes and Governmment Budgets: How Do They Affect Saving?*, OECD Working Papers, Vol. III, No. 68 (Paris), 1995, para. 50.

population to pensioners. If FF pension schemes are in place, or are to be adopted, steps should be taken to reduce their high administration costs, inequity and high risk. There will also need to be some sort of safety net for the elderly poor. The switch to FF pensions must not be a covert device for cutting the pensions of the poor. If PAYG schemes are used then steps should be taken to increase public awareness of the relationship between taxation and pensions provision, and to introduce a variety of schemes which will provide greater choice.

Whatever scheme, or combination of schemes, is used, the characteristics of the scheme should be evaluated with respect to the parameters defined in equation (3).

Discussion of chapter 2

2.A The macroeconomics of pension reform

Colin Gillion

It gives me great pleasure to act as discussant of John Eatwell's paper *The Anatomy of the Pensions "Crisis"*. Not least because I agree with everything he says. Indeed, I only wish that his remarks about the macroeconomic equivalence of funded and non-funded pension schemes were brought to a wider audience. One has only to read the *Wall Street Journal*, the *Financial Times* or *The Economist*, let alone the publications of the World Bank or the OECD, to gain the impression that if only countries were sensible enough to adopt fully-funded schemes, the problem of ageing population structures would be solved. As John Eatwell remarks, this is simply bad economics, and dangerous for policy.

But as a discussant, this leaves me dangerously exposed. The audience has a right to expect sufficient disagreement between presenter and discussant to create debate and uncertainty and to underline points of dispute. In this case there is none. So I propose to focus my brief remarks on two or three points, and perhaps try to reinforce what John Eatwell has already said and to add a comment of my own.

The fallacy of composition

A major point concerns the fallacy of composition.

Under a pay-as-you-go (PAYG) public pension scheme – which is by far the most common pension arrangement in Europe – the cost of pension outlays is borne by today's workers, through contributions or taxes. Pension benefits are defined in terms of a formula which relates them to past earnings and the period of contributions.

Under a fully-funded scheme pension benefits are related to the worker's individual savings, plus the interest on those savings. On retirement the accumulated capital sum is converted into an annuity, and benefits are defined in terms of past contributions (a defined contribution (DC) scheme). But in macroeconomic terms, consumption goods cannot be carried over from one period to another. So pensioners must gain their command over consumption goods by selling financial assets to workers, who will wish to purchase the assets as saving for their own retirement. The point is illustrated (hypothetically) in table 2.A.1.

The key point to note about this table is that whereas the ratio of per capita pensioner's income to that of active worker's is around 23 per cent, the corresponding ratio of consumption is around 72 per cent. To make up the difference pensioners must sell assets to active workers, and workers must save sufficiently not only to provide for gross fixed investment and investment in stocks, but also to purchase financial assets. The amounts involved are large – in this case they amount to 9 per cent of gross national income – and the volume of financial transfers from active workers will undoubtedly have a profound impact on financial markets. But they will not have an impact on the macroeconomic position. Either through taxes and/or contributions (PAYG) or through savings (defined contributions, usually

TABLE 2.A.1

The fallacy of composition

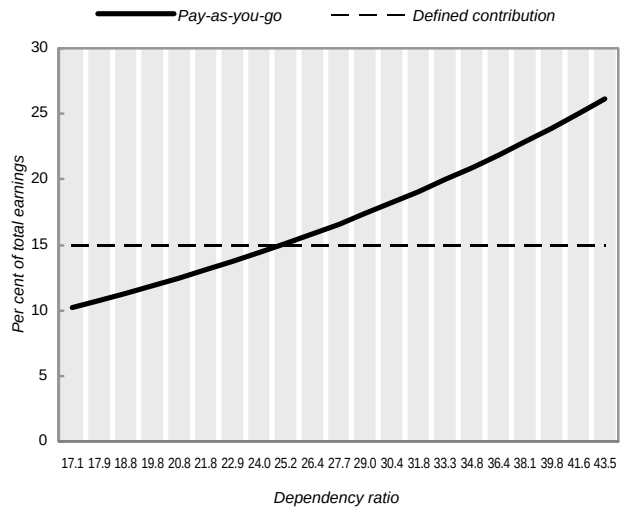
(Hypothetical national accounts)

Expenditure on gross domestic product		**Incomes generated by gross domestic product**	
Personal consumption expenditure by retirees	1 600	Wages and salaries of active persons	7 800
Personal consumption expenditure by actives	6 700	Profits received by active persons	1 300
Total personal consumption expenditure	8 300	Total income of active persons	9 100
Government consumption expenditure	400	Wages and salaries received by retired persons	0
Gross fixed investment	1 400	Profits received by retired persons	700
Increase in stocks	100	Total income of retired persons	700
Exports minus imports	-200	Transfers from abroad	200
Gross domestic product	10 000	**Gross national income**	10 000
Population of retirees	25	Savings by actives	2 400
Population of actives	75	Dissavings by retirees	-900
Total population	100	Total net savings	1 500
Per capita consumption of retirees	64	Per capita income of retirees	28
Per capita consumption of actives	89	Per capita income of actives	121
Ratio of per capita consumption	0.72	**Ratio of per capita incomes**	0.23

Note: Calculations are hypothetical.

CHART 2.A.1

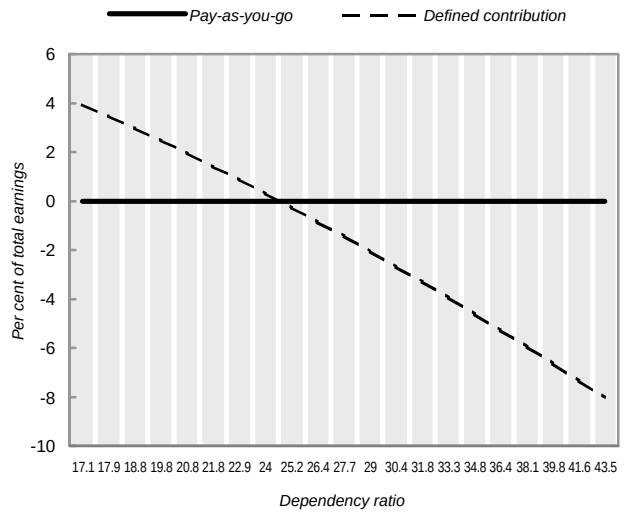
Contribution rates at different dependency ratios
(Per cent)



Note: Calculations based on hypothetical alternatives.

CHART 2.A.2

Saving rates at different dependency ratios
(Per cent)



Note: Calculations based on hypothetical alternatives.

mandatory) the same volume of transfers must take place if pensioner's incomes are to remain unchanged.

Savings and demography

Under a PAYG defined benefit scheme the contribution rate is the dependent variable. Pension benefits are fixed and if pension outlays increase – because of increases in the dependency ratio – contribution rates must be increased to ensure that the scheme is in balance. Present indications are that if replacement rates and the age of (actual) retirement are to remain unchanged, contribution rates may need to double over the next 30 or 40 years to meet the needs of ageing populations in Europe. This is shown in chart 2.A.1.

What happens under a defined contribution scheme? Under such a scheme the contribution rate is fixed and (setting aside variations in interest rates for the moment) the retirement account of each individual is in balance over his or her lifetime. But as the population structure ages the number of pensioners who are dissaving increases relative to the number of active workers who are saving. The total volume of saving declines. The point is illustrated in chart 2.A.2.

If there is any source of confusion about whether or not funded defined contribution schemes increase the aggregate savings rate, it probably centres around what will happen during any period of transition from a PAYG scheme to a DC scheme. During the transition the defined contribution scheme starts to build up balances in the accounts of individuals, to which the individuals must contribute. But the state still retains obligations to existing pensioners with pensions derived from the old public PAYG scheme, and for those soon-to-be pensioners whose rights derive from their earlier contributions to the PAYG scheme. Workers must continue to contribute to the old PAYG scheme. Hence the adage, well known in pension economics, that during the transition workers must pay twice: once for the pensions of their parents and once for their own pension. But this is not necessarily the case. Governments may borrow the money to meet their pension obligations, drawing on the new money placed on the market by the new generation of defined contribution savers. Or they may allow individuals to borrow money to do the same thing. The fallacy of composition works in reverse: the transition does not alter the claims on income required by pensioners or, conversely, the amounts of money which must be set aside by workers – either in the form of taxes and contributions or in the form of individual savings – to provide for that income.

Total and old age dependency

Projections of the old age dependency ratio, which is the main force driving up total pension costs, appear to be relatively robust. They suggest that for most countries in Europe total pension outlays will double over the next 40 years. But at any given time the total number of dependents is around 50 per cent of the population and includes children, non-working wives, the sick, the unemployed and the disabled, as well as those who are retired and have withdrawn from the labour market. If all these inactive persons are gathered together the total dependency ratio is much higher than that for just retired persons. But it is much less responsive to the ageing of the population. The number of children will be fewer and (hopefully) so also will be other categories of inactive workers. The figures, both for the dependency ratios and

TABLE 2.A.2

Total dependency and contribution rates under different scenarios
(Per hundred)

	Dependency rates in 2035 under alternative scenarios					Contribution rates in 2035 under alternative scenarios				
	Japan	*France*	*Germany*	*Norway*	*Italy*	*Japan*	*France*	*Germany*	*Norway*	*Italy*
1995 base level	46.0	55.6	50.8	48.2	59.9	33.8	42.9	38.3	35.8	47.2
2035										
No change scenario	55.8	63.3	61.5	56.5	69.9	43.1	50.8	48.9	43.8	58.2
Higher retirement age for men	55.8	57.3	54.8	52.8	62.0	43.1	44.6	42.1	40.2	49.5
Increased female participation	52.8	59.1	57.4	56.5	60.4	40.2	46.5	44.7	43.8	47.8
Both	52.8	53.2	50.7	52.8	52.5	40.2	40.5	38.2	40.2	39.9
Both plus lower replacement rates	52.8	53.2	50.7	52.8	52.5	37.7	38.0	35.7	37.7	37.4

Note: Projections are calculated under alternative hypothetical scenarios.

for the implied contribution rates (counting children as half an adult and a pensioner as three quarters) are shown both for 1995 and 2035 in table 2.A.2.

If nothing is done, the table indicates the expected increase in total dependency rates. Germany, Italy and Japan all increase by about 10 percentage points; France and Norway by about 8 percentage points: much less than the comparable increases for pensioners alone. But what happens if labour force trends alter? The experiment consists first of raising the actual retirement age for men for all countries up to the current age in Japan, which has the highest retirement age; second, of increasing participation rates for women up to the current level in Norway, which has the highest rate; and then combines these two changes and adds to them a 10 per cent reduction in replacement rates.

The results are fairly startling. In France, Germany and Italy, overall contribution rates in 2035 would be *lower* than they were in 1995. In Japan and Norway they would be only slightly higher. Note that this simulation does not impose any experience which has not already occurred: it simply involves bringing the experience of other countries up to the level of those currently highest.

What it does show is that there is more to be gained from appropriate labour market policies – especially those involving later retirement and greater proportions of women in employment – than from the rather sterile debate about funded or non-funded schemes. As far as the employment of women is concerned, such policies are probably swimming with the tide: female participation rates have been rising for some time. To increase the actual average age of retirement of men is likely to be politically more difficult, and is in fact swimming against the tide.

But there is a long time for such changes to be put in place – 40 years or more – and by the time their benefits are needed we will all be much more wealthy.

2.B Alternative pension systems

D. Mario Nuti

In his presentation John Eatwell has developed what appears to be a Keynesian approach to the analysis of alternative pension systems, finding that – other things being equal – the "pay-as-you-go" (PAYG) system and the "fully-funded" (FF) system are broadly equivalent. However, this proposition derives not so much from his Keynesian approach but from his macroeconomic framework. Therefore, John Eatwell's claims have greater generality than it might at first sight appear.

We are dealing with intergenerational transfers and – as Colin Gillion has also pointed out – there are certain necessary propositions that derive from this aspect of the pensions issue. The propositions that John Eatwell puts forward are that first, a funded system is not necessarily associated with higher savings; second, if it is associated with higher savings, it does not necessarily lead to higher matching investment; and third, if it leads to higher saving but not to matching investment it will actually be associated, perversely, with fiscal imbalance, i.e. a higher government deficit.

Whether or not a funded pension system is associated with higher savings is basically an empirical question which is highly controversial. Clearly it is utterly unrealistic to expect that any compulsory contributions by the public to a funded system will automatically correspond to 100 per cent additional saving. People will already have a certain amount of voluntary savings and any additional payments that they may be forced to make into a funded pension account presumably will go to replace at least some of those voluntary savings. Therefore, in the move from a PAYG to an FF system, we should expect a strong effect on savings in those countries where individual contributors to PAYG do not have any individual savings, and a progressively smaller effect the higher the existing level of voluntary savings. Perhaps it is also unrealistic to expect, like John Eatwell, that there will be *no* additional saving as a result. However, the usual counter-example of Chile, where 10 years after switching to the funded system the capitalization of the stock exchange had gone from 5 to 40 per cent of GDP, by itself is not very

convincing, because such apparently spectacular growth is actually par for the course in developing countries in the same period regardless of their pension system. Between the extremes of 0 and 100 per cent, Maria Augusztinovics estimates that the share of funded pension contributions turning into additional savings is of the order of 50 per cent. Others, like Ajit Singh, are more sceptical; indeed Martin Feldstein argues that a switch to a funded system might actually reduce savings and investment. But this is a question for empirical studies and there should be more of them.

The second point raised by John Eatwell is that, even with a positive impact of fully-funded pension systems on savings, higher savings do not necessarily lead to higher matching investment; and his third point is that, if they do not, then they may have adverse fiscal implications. Here some qualifications are in order. Namely, in an open economy those conclusions are very greatly weakened, because if higher savings are not matched by higher investment domestically they can be matched by higher international investment; domestically, instead of worsening the fiscal balance higher private savings may lead to an improvement in external balance. Thus a discussion of pension alternatives in national terms has some limitations.

However, once we recognize the opportunities for international trade and investment, we cannot and should not stop at a partial equilibrium investigation of the single open national economy. We must look at the global economy in its entirety, which by definition is a closed economy. Therefore, when we look at alternative pension systems on an international global scale, paradoxically the conclusions obtained for a closed economy apply. An open economy which operates on a global stage no longer has the constraints of a closed economy, but the global economy still must meet those constraints. In the streets of Geneva there are lots of posters depicting the globe, advertising a particular bank claiming that "This is the view from our window". Indeed, looking at economic problems from a Geneva standpoint, we must consider them in a global context. And in the global picture the second and third propositions put forward by John Eatwell still hold. Higher private savings in individual countries can be matched by higher investment elsewhere or by improvements in their external balances, but at the aggregate world level higher global savings, such as might be obtained through a generalized switch to funded pension systems throughout the world, are not necessarily matched by higher world investment and, if they are not, they will be accompanied by a greater aggregate fiscal imbalance on a world scale.

Moreover, suppose that once we look at international trade and investment flows we find that John Eatwell's propositions, admittedly a possibility and not a necessity, do not happen to hold, that higher domestic savings are turned into international investment. This can also be a cause for concern, instead of complacency, if it is due to observable transfers by pension funds in developing countries to the developed world. Increased volatility of world financial markets due to large-scale investment flows by pension funds across borders, in addition to the well known short-sightedness and consequent short-termism of pension fund investment policy, is also a concern.

When assessing the sustainability or otherwise of PAYG pension systems, emphasis is usually given to the widespread ageing of populations. It should be stressed that while population ageing is indeed a major cause of PAYG systems' crisis, the general rise in unemployment has been equally pernicious, for both phenomena raise the burden of old age pensioners on those currently employed. Thus any policy reducing national unemployment has the added benefit of improving automatically the sustainability of national PAYG systems.

Finally, a transition from a pay-as-you-go system to a fully-funded system, whatever its merits, has also some net costs that should be set against them. These are the unnecessary costs of converting to a fully-funded system that part of a PAYG system which is balanced, in the sense illustrated below.

A fully balanced pay-as-you-go system is one in which current pensions match exactly current contributions and there are no assets or liabilities. This system formally resembles a so-called Ponzi scheme or pyramid banking, but has very special features that make it viable. In pyramid banking an interest rate higher than obtainable in the use of funds is paid to existing depositors out of new deposits, thus generating a negative net present value growing over time, until at some point new deposits dry out and the system necessarily collapses. In a fully-balanced PAYG system pensions are (and have always been) paid out of new contributions and equally there is an increasing negative net present value of future liabilities to pensioners not matched by current assets (gross assets being zero); such negative net present value surfaces when current contributions are switched to a fully-funded system. But a PAYG pension system – unlike other forms of pyramid banking – is *viable*, because there are always new depositors (i.e. those currently employed) and withdrawals are restricted (to old age). Therefore the cost of making the negative present value of that system come to the surface is a real claim on current resources which need not be paid off, for, by definition, as long as the system remains balanced the day of reckoning never comes. The unnecessary nature of the cost of transforming such a PAYG system into an FF system is easily understood by considering that the privatization of such a PAYG system, to a private institution enabled to maintain pensions at a level no greater than allowed by current contributions, would not require any public compensation for the outstanding net negative present value, nor any recurring future subsidy.

An unbalanced PAYG system, paying current pensions higher than current contributions, in turn can be notionally split into a viable balanced segment and a deficit. The balanced segment can be visualized as notionally paying an average pension that exhausts current contributions, plus a deficit corresponding to the higher average pension paid to all old age pensioners. The "true" PAYG debt, for which the day of reckoning sooner or later will come, is the present value of those future deficits. This is the compensation that would have to be paid to a private institution willing to take over responsibility for continuing to run that system. It is clearly undesirable, non-transparent and non-sustainable to sweep those deficits under the carpet of quasi-fiscal liabilities funded through credit (or through disinvestment – if there are some gross assets to run down, i.e. if the system had at some point in the past a gross positive present value). It is infinitely preferable, and also transparent and sustainable, to allow such a "true" PAYG debt to surface at once, endowing the PAYG system (through the fund, or the agency running it) with government bonds matching in amounts and maturities future uncovered pension liabilities, and to keep meeting any possible yearly increase in such a "true" PAYG debt out of the government budget. If an FF system was deemed to have other advantages (besides sustainability), a conversion of the "true" PAYG debt into an FF system would yield those advantages at no extra cost, other than that of funding that part of government debt which FF pension funds would not retain in their portfolios. In order to reduce this extra cost, the conversion of the "true" PAYG debt could be done gradually over time. This seems a much superior alternative to the conversion of the entire PAYG system to FF, which would bring about the surfacing and additional current cost of the entire negative net present value of the PAYG system. In either case the state net wealth is unaffected by the operation, but the conversion of the entire PAYG system has an unnecessary current cost, for the sole purpose of beautifying the pension system.

An alternative to a partial or total conversion of PAYG into FF is the Swedish approach of maintaining a pay-as-you-go system, but turning it into a kind of "virtually" funded system, by relating benefits to past contributions and mimicking the working of a fully-funded system without actually incurring a public cost in the course of its transformation.

The basic equivalence of the two systems – PAYG and FF – for a given suitable set of system parameters should not obscure the fact that, once those parameters are given, the two systems can behave very differently in terms of their evolution over time depending on demographic and employment trends. But we should never compare, as it is often done, a badly run PAYG in adverse demographic conditions with a well run FF system in favourable conditions of sustained profitability and growth. A balanced PAYG system does not create a budgetary claim, while an FF system can be destroyed by prolonged economic crisis or by war, as has often happened in the past, generating net budgetary claims for pension subsidies just like an unbalanced PAYG system. Once, as is often the case, minimum pension levels are guaranteed by the government, an FF system can be just as much of a time bomb as a PAYG system.

2.C Lessons from Germany on occupational pensions

Thomas Weiss

In Germany, too, there has been an extended discussion about whether provision for old age should be financed according to the pay-as-you-go system or with the help of a capital funding system. For a long time the view prevailed in Germany that the two types of financing provision for old age are of equal value as far as their macroeconomic implications are concerned. This corresponds to what Professor John Eatwell said in his review paper. Already in the 1950s, United States economist Paul Samuelson had presented a corresponding result. In the same decade a similar thesis, the so-called "Mackenroth theorem", was published in Germany.

As contribution rates towards pension insurance have increased over recent years in Germany, the discussion about the type of financing of pension insurance has been revived.[159] At the moment, however, difficulties in financing pension insurance are mainly caused by an imbalance on the labour market and less by population ageing. Due to unemployment there is a lack of contributors who finance pension insurance from their income. In this context it can also be mentioned that according to calculations of the Federal Labour Ministry, 0.5 per cent of GDP growth is necessary in order to maintain pension insurance without a loss in the purchasing power of employees and pensioners in the present situation where the population is ageing.

At the moment the predominant view in Germany seems to be that the so-called first pillar or first tier of provision for old age should continue to be based on the pay-as-you-go system. There are, however, proposals for extending the base for pension insurance by extending the second and third pillars. In Germany the second pillar or the second tier are occupational pensions which primarily build on a capital funding system.

It has to be mentioned, however, that this second pillar is shrinking somewhat in Germany at present. Occupational pension schemes have come under pressure from two sides. As far as the employers are concerned

[159] T. Weiss, "The German social insurance system", *Managing the Cost of Transfer Programmes*, OECD, Public Management Occasional Papers, No. 16, 1997.

their readiness to commit themselves to long-term pension payments is decreasing on account of increasing global economic risks.

On the other hand it can be observed that occupational pensions were in principle granted because workers used to have a long-term employment relationship with their employer. However, in view of increased globalization and also for other reasons, workers are expected to be more and more flexible and mobile, i.e. to change jobs several times. Thus, as far as workers are concerned, this development undermines to a certain extent the basis of an occupational pension scheme.

In this context I should like to specify some facts about the occupational pension system (second pillar) in Germany.[160] Such pension schemes are particularly prevalent in the economic sector of banks and insurance companies.

Occupational pensions are primarily drawn by people who already receive an above average old age pension under the statutory pension insurance system. Thus, up to now occupational pensions are primarily a matter for those in receipt of higher pensions, and only to a lesser extent for those in receipt of lower pensions.

Occupational pension systems have been mainly established by large enterprises, and only to a lesser extent by medium and small enterprises.

The federal government will continue to make an effort to support and promote the second pillar of the occupational pension schemes. However, some difficulties connected to occupational pension schemes have been outlined above.[161]

The third pillar of provision for old age in Germany is based on the population's own initiative: it may for example take the form of a life insurance policy. Here of course the difficulty arises whether and to what extent individuals are able to ensure their own pension income. The distribution of wealth in Germany is rather imbalanced, as is also the case in other market economies. In order to correct this situation, a fourth pillar of provision for old age has been increasingly reintroduced into the discussion. Reference is made to the promotion of equity holdings by workers in the companies where they are employed, a subject which has been discussed for a long time in Germany, and Germany also has a long-standing tradition of promoting such equity holdings. Recently plans have been drawn up to promote the purchase of shares at the stock exchange in a targeted way.

Insofar as this promotion of capital formation for workers leads to a more balanced distribution of wealth, a larger and larger part of an individual's assets can provide an additional insurance against age-related risks. The fourth pillar thus supports the third pillar.

I should like to conclude with some statistical data on occupational pensions in Germany. When considering persons aged 65 and older and breaking this group down into five income brackets, i.e. in five quintiles, the following statements can be made:

- Almost the whole population is covered by pension schemes, i.e. almost everybody has an income from pension insurance schemes;
- About 90 per cent of the population draws an income from statutory pension insurance;
- In the bottom quintile only 10 per cent of persons draw an occupational pension;
- In the third to fifth quintile, i.e. in the three quintiles with higher incomes, around 30 per cent of persons draw an occupational pension;

Looking at the five quintiles from the angle of the source of income, the overwhelming share of income comes from the statutory pension insurance for the lower three quintiles. As regards the two upper quintiles, between 10 and 20 per cent of income comes from the provision for public functionaries' (*Beamte*) old age benefits, as public functionaries are more strongly represented among persons with higher incomes. Income from occupational pensions plays a relatively minor role. In the fifth quintile representing the highest incomes, where most occupational pensions are drawn, occupational pensions only account for 6 per cent of the income of this quintile. All in all the incomes from pension schemes amount to over 80 per cent of total income. In the top quintile these incomes account for only 70 per cent of total income and 30 per cent thus come from other sources. A large part of this other income is revenue from capital investments. However, it stands to reason that this type of revenue is not fully recorded in the statistics because all types of revenue are not mentioned by those persons statistically surveyed.

[160] Deutscher Bundestag, *Alterssicherungsbericht 1997*, Drucksache 13/9570 (Bonn), 1997.

[161] Deutscher Bundestag, *Zweiter Zwischenbericht der Enquête-Kommission "Demographischer Wandel – Herausforderungen unserer älter werdenden Gesellschaft an den einzelnen und die Politik"*, Drucksache 13/11460 (Bonn), 1995.