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Occupational Pension Schemes: Prospects and Reforms in the UK

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I. INTRODUCTION

Private pensions seem likely to provide the dominant source of income for the majority of retired workers in the future.² New private pension instruments developed since 1986, notably personal pensions, have proved popular, but concern as to ‘overselling’ of personal pensions and as to the risks associated with the ‘money purchase’ form of pension provision is frequently voiced by commentators. For many people, rightly or wrongly, the ‘traditional’ final-salary-based occupational pension remains the bench-mark for private pension provision in the UK. Nevertheless, recent trends, most notably the growth of alternatives to final-salary-based arrangements and a shift in attitudes towards pension provision among employers, suggest that the occupational pension sector will undergo significant changes in the future.

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² For a general discussion of trends in pension provision in the UK, see Dilnot, Disney, Johnson and Whitehouse (1994) and Disney, Johnson and Stears (1995).

This paper considers these trends and potential reforms in pension arrangements. Section II focuses initially on the perceived distinction between ‘salary-related’ and ‘money purchase’ schemes, and asks whether these differences are more apparent than real. Strategies for reducing the different ‘riskiness’ of the two kinds of instruments are also discussed. Section III examines some interesting attitudinal data collected for the Confederation of British Industry by William M. Mercer Ltd, and kindly made available to IFS, in anonymised format, by the former, on perceived trends in type of pension coverage as seen by companies that currently offer occupational pension plans. Section IV attempts to provide some preliminary costings of some commonly proposed modifications to occupational pension schemes, and suggests that these costs may motivate the observed shifts in the form of coverage. Finally, Section V offers some conclusions.

II. INSURANCE PROPERTIES OF OCCUPATIONAL PENSION SCHEMES

1. Types of Occupational Pension Plans

Pension schemes are traditionally differentiated according to whether they are, in British terminology, ‘salary-related’ or ‘money purchase’. International terminology describes such schemes as, respectively, defined benefit (DB) and defined contribution (DC) plans.

In ‘salary-related’ or DB plans, a certain level of pension benefits is promised to the participant, conditional on the individual’s years of service and some measure of earnings. Although it is not an essential requirement of a salary-related plan, the earnings measure used in calculating pension benefits in DB plans is usually in practice some form of (smoothed) final earnings. Since such plans ‘tilt’ benefits towards individuals with longer plan tenures and therefore higher final earnings, it is an intrinsic feature of DB plans that there is redistribution of plan benefits, relative to contributions, from early leavers to those with uninterrupted pensionable jobs to retirement; this is sometimes termed ‘backloading’ of benefits.

In group DC plans (also sometimes known in Britain, where contracted out, by the acronym COMPS — contracted-out money purchase schemes) or in individual DC plans such as personal pensions, the pension scheme commits the member to a level of contributions but there is no explicit commitment to a level of pension benefits. The pension annuity paid will depend on the level (and timing) of contributions, the rate of return accrued on the fund and the transactions cost involved in converting the fund accrued at pensionable age into an annuity. Since investments early in the plan life accrue a compounded return

for a longer period, there is a sense in which DC plans with a constant contribution rate over time ‘frontload’ benefits.

Although DC plans may sometimes take the form of a ‘target benefit’ plan, and may include some agreement from the employer to supplement employee contributions, it is likely in such plans that a large degree of (undiversifiable) investment risk (i.e. fluctuations in the value of the accumulated fund) will be borne by the participant. This has led many commentators (such as Davies (1995)) to argue that an essential distinction between DB and DC plans is that in the former, the provider bears a large component of the riskiness of the plan, whereas in the latter, most of the risk is borne by the participant (employee). Therefore if plan participants are risk-averse (and providers presumably risk-neutral), a DB plan is preferable to a DC plan *where the expected returns are equal*. This assertion is considered in more detail below; it should be noted immediately, however, that there should be no redistribution from early leavers to long-tenured individuals in DC plans; subject to transactions costs, such plans are fully portable.^{3,4}

2. Coverage by Occupational Pension Plans

Since only DB plans could attract approved status under the original provisions of the contracting-out legislation, it is not surprising that DB provision is still the dominant form of occupational pension plan provision in Britain. Government Actuary’s Department’s evidence provided to the Goode Committee based on the 1991 (ninth) Survey of Occupational Pension Schemes (Government Actuary’s Department, 1995) suggests that the great majority of employees in occupational pension schemes belong to DB plans (Table 1).

All contracted-out DC plans are of recent origin, consequent upon the 1986 legislation which for the first time permitted pension schemes of the DC type to obtain approved status for contracted-out purposes. In the decade prior to that time, DC plans typically supplemented DB plans, although DC plans were the dominant form of provision for the self-employed (known as s226 plans). In addition, the 1986 legislation permitted individuals to contract out into individual DC pension contracts, on the same terms as other DC plans; these individual DC plans, known as personal pensions, have proved very popular (and controversial), with well over 6 million optants for approved personal pension

³ The assertion concerning DB plans is open to question in so far as the benefit guarantee is to a nominal rather than fully-indexed benefit and where market risk is borne by contributors as a whole via changes in the contribution rate. Furthermore, there may be no more than partial legal guarantees of payment of pensions in the event of bankruptcy, dissolution or fraud.

⁴ It has also been argued, in comparing DB plans with personal pensions, that the former are preferable because the employer makes a contribution whereas few employers do so when their employees buy personal pensions. It is trivially true that, if there is a demand for longevity insurance, then a plan with greater contributions will yield a larger annuity than one with smaller contributions, but this evident fact gives no particular rationale for any form of pension plan. Furthermore, it ignores the whole issue of the *incidence* of contributions.

TABLE 1
Number of Employees in Occupational Pension Schemes

	<i>Millions</i>			
	<i>Private sector, contracted out</i>	<i>Private sector, contracted in</i>	<i>Public sector, contracted out</i>	<i>Total</i>
DB scheme	5.04	0.56	4.20	9.80
DC scheme	0.43	0.47	0.00	0.90
Total	5.47	1.03	4.20	10.70

Source: Government Actuary's Department.

plans to date. Finally, for completeness, mention should be made of DC-type arrangements made with existing DB plans to top up contributions in order to enhance final salary benefits. These are known as additional voluntary contributions (AVCs). It is now possible to buy AVCs, with the same tax treatment, under free-standing arrangements with pension providers other than one's own occupational scheme; these are known as FSAVCs.

3. Incentive Structures in DB Plans

It is useful to consider further the earlier assertion as to the relative incidence of risks in DB and DC plans, considering first the incentive structure of the former. A basic rationale (or consequence) of a *final salary* DB plan is to reward disproportionately long-serving plan members. It is not possible to reward long-service members (by basing pensions on final salary or offering some implicit 'bonus' on average salary to long-tenured individuals) and at the same time to offer the average rate of return to early leavers. It is the 'saving' on *not* offering the full return to early leavers that 'pays for' the bonus to long-serving members.

This issue is important to the subsequent discussion and it is worth putting down formally utilising a stylised model analysed by Brugiavini and Disney (1995). Suppose there are two periods of the working life, 1 and 2. Assume that a pension plan, whether of the DB or DC type, can, *on average*, provide a risk-free rate of return, r , on contributions in each period. Denote $R = 1+r$. Thus, after two periods, the period 1 contributions will on average earn R^2 . Whether the issue of expected return matters depends on the treatment of the 'equity premium', assuming that plans largely invest in equities. Denote the annual return on equities (the risky return) as z ($Z = 1+z$). A convenient assumption here is that there is no risk premium, i.e. $E(z) = r$, where $E(\cdot)$ denotes expected value; this is not central to the current discussion (but see below).

Now assume that in the DB plan, individuals face a probability $1-\lambda$ of leaving the scheme after period 1 (i.e. a probability λ of staying on), and, as early leavers, do not receive *any* return on their period 1 contributions (this is a simplification of the status quo, where benefits are incompletely preserved to

nominal earnings growth). Assume that individuals who survive until retirement also receive a backloaded pension ‘bonus’ on their contributions of β . Finally, assume that income, Y , is equal in the two periods and that pensions are financed by a contribution, t .

The pension benefit structure for the DB plan in retirement (period 3) is then

Receive $tR^2Y_1 + t(R+\beta)Y_2$ with probability λ if not laid off;

Receive $tr(Y_1+Y_2)$ with probability $1-\lambda$ if laid off.

Given the DB plan is fully funded, there *must* be a relationship between β and λ ; a plan may adopt any combination of β and λ of equal cost subject to a reputation constraint (that is, that excessive backloading of benefits induces the perceived possibility of renegeing by the firm) and by the financial requirement that

$$\beta = Rr(1-\lambda)/\lambda.$$

To put it another way, DB pension schemes cannot both pay benefits on a final salary basis and offer to other members (early leavers) as good a return as a DC plan. This is a result from simple mathematics, not of finding a contribution rate ‘high enough’ to finance any degree of generosity of benefits.⁵ Suppose, for example, that the contribution rate t was raised to pay for ‘more generous’ benefits for early leavers. This would leave the incentive structure, and the redistributive content of the DB plan, unchanged; early leavers would still receive a lower return on their contributions. Only by changing the benefit structure, or by raising λ or by lowering β , could the return for early leavers be improved. This ‘risk’ attached to traditional DB plans arises from incomplete portability and the final salary nature of most such schemes; it is a different risk from ‘investment risk’ but, if expected job tenures are unknown, may be just as important in practice. Of course, it is these specific features of the DB plan, rather than the DB plan *per se*, which generate the risk.

4. Immunisation of Risks in DC Plans

In the framework of the previous simple model, the risk attached to DC plans is straightforward. If DC plans invest in equities, and z , the risky return, is unknown, then the DC plan cannot guarantee r , the risk-free rate of interest. Indeed, if there is an equity premium, i.e. $E(z) > r$, (and there must be, otherwise there would be no demand for equities amongst risk-averse individuals), this fact is emphasised. For whereas the DB plan can continue to invest in equities and spread equity risk across generations (for example, by changing contribution

⁵ For detailed micro-simulations that illustrate this point, see Disney and Whitehouse (1994).

rates), the DC plan will pass the investment risk through to the individual plan participant.⁶

The question therefore arises as to whether DC plans can in part ‘immunise’ against investment risk.⁷ Several strategies are seen to be available:

- Investing in a different portfolio of assets from DB plans, such that r can be guaranteed. There is evidence that DC plans in the US have adopted such a strategy (Davies, 1995, Chapter 10), and this practice was true in the less recent past in the UK, where plans were commonly invested in gilts, but it does not seem to be the case at present in the UK. At least until close to maturity of the individual DC plan, portfolio structures seem pretty similar to that of a typical DB plan. The detraction of the DC plan’s investment strategy is obvious: if there is an ‘equity premium’, the DB plan can on average earn a higher average rate of return than a DC plan.
- Flexibility in the timing and valuation of the annuity: for example, deferred or variable (participating) annuities in which either the fund is annuitised gradually or the value of the annuity continues to fluctuate (at least partially) in line with the capital market (see World Bank (1994, Issue Brief number 10)). Again, the issue of incomplete immunisation arises as well as the possibility of transactions costs.
- Hedging strategies such as the use of futures and commodity markets. These are advocated by, for example, Zvi Bodie (see Bodie, Marcus and Merton (1988)) and have been implemented by some insurers. The difficulties would seem to be transactions costs and the possible effects on these markets of large-scale hedging.
- Pooling strategies across ‘generations’ of retirees analogous to DB plans: for example, by restricting the date of annuitisation for each participant such that fluctuations in market values can be spread across successive ‘waves’ of annuitants by some form of averaging procedure in the valuation. Such methods seem attractive, but may not be available if there are insufficient participants.⁸ It will be noted that such strategies bring DC plans much closer to DB plans in their insurance provisions.

⁶ The issue of higher transactions costs is also raised in the context of DC plans. It is hard to see why DC plans have significantly higher transactions costs *per se*, although it is sometimes argued that the intrinsic individual nature of the DC plan valuation may raise costs. The implication is that because individual DB plan valuations are rarely undertaken (except at plan separation or termination), somehow such plans are ‘cheaper’ to run. This is of little comfort to DB plan participants who have little idea what their accrued benefits are worth and are usually disappointed at their low values if they leave the plan prematurely. The issue of transactions costs in individual DC plans (such as personal pensions) as opposed to occupational plans (whether of the DC or DB type) is a quite different issue.

⁷ The term ‘immunise’ is generally considered in the specific context of inflation risk, and concerns, *inter alia*, the existence of index-linked securities. It is used in the wider context of investment risk here.

⁸ An inadequate (or unrepresentative) size of the ‘pool’ of insured participants may also generate adverse selection problems.

5. A Summing-Up: DB versus DC Plans — What are the Real Trade-Offs?⁹

As suggested in the introduction, there has been a fair amount of confusion as to the characteristics, and relative merits, of DB and DC plans. As described here, the best way of thinking about the problem is to envisage the individual attempting to purchase an annuity guaranteeing as a minimum the risk-free rate of interest, and, by its nature, offering full longevity insurance. Neither DB nor DC plans are fully able to guarantee provision of this risk-free rate of interest: DC plans because they cannot fully immunise the individual from investment risk; DB plans because, in their final salary form, the individual is exposed to risk of premature job termination pre-retirement and the costs of incomplete portability, and because of the effect of earnings uncertainty where benefits are conditional on a limited number of years' salaries (for example, final salary). There is no means of asserting a priori which plan type, whether DB or DC, is better, without evaluating these relative risks (and their covariance) explicitly for each individual (see Brugiavini and Disney (1995)).

Indeed, we can go further than this. A DB plan that based pension benefits on average earnings and was fully transferable, *or* that revalued preserved benefits in line with nominal rates of return, would be largely indistinguishable from a DC plan. Conversely, a DC plan portfolio that was fully immunised from rate-of-return uncertainty (for example, by pooling annuity values across generations of annuitants) would be largely indistinguishable from a DB plan. Thus the distinction between DB and DC plans is to some extent semantic and, even if there are differences in practice, it is perfectly possible to envisage a mix of DB and DC plan features that provides partial insurance against all the underlying risks (World Bank, 1994). Nevertheless, as the next section suggests, companies may have decided that the best way to unlock future commitments is by radical, rather than incremental, changes in pension provision.

**III. PROJECTED TRENDS IN COVERAGE BY DB AND DC PLANS:
IS THERE A 'STAMPEDE' TO DC PLANS?¹⁰**

One recent phenomenon noted in both the US and Britain is that employers have increasingly found DC plans more attractive than DB plans. Given that the previous section argued that the distinction between DB and DC plans was not as clear cut as some protagonists would admit, this might seem surprising. Nevertheless, the distinction should be borne in mind between the relative flexibility of plan types in principle and the more rigid actual structures embodied in specific plans; thus the move can be seen as a move away from the traditional final salary plan towards a more 'flexible' form of pension provision.

⁹ With apologies to Bodie, Marcus and Merton (1988).

¹⁰ With acknowledgement to Gustman and Steinmeier (1992).

In the US, prior to 1975, two-thirds of new plans were of the DB type and one-third of the DC type. Since 1975, 80 per cent of new primary plans have been of the DC type. As a result of these trends, the proportion of covered workers in primary DB plans in the US has fallen from 78 per cent in 1975 to 64 per cent in 1989, and is projected to fall to 51 per cent in the year 2000 (Turner (1993); see also Gustman and Steinmeier (1992)).

In the UK, the shift to group DC plans (COMPS) has been slower, as described previously. Much of the upsurge in DC coverage has taken the form of individual plans, i.e. personal pensions. Nevertheless, there is much greater interest now amongst British companies in establishing or re-establishing plans as money purchase plans, as any firm of consulting actuaries will confirm. A recent survey commissioned by the CBI illustrates this starkly (see CBI (1994)). William Mercer were commissioned by the CBI to ask over 500 senior executives, whose schemes covered one-third of private sector membership of schemes, what type of pension plan they had, what type, with hindsight, they would have preferred to operate, and what type of plan they predicted that they would operate by the year 2010.

The overwhelming practice was to provide DB pension plans: 81 per cent operated some form of final salary DB plan. However, very few final salary schemes had been introduced since 1988, given the greater flexibility of approved plan type permitted under the 1986 legislation. With hindsight (or with the current more liberal contracting-out arrangements), few firms would now prefer *not* to have provided pensions, but only 26 per cent would choose to do so on a final salary DB basis if they could 'start from scratch'. Fifty-seven per cent would now operate on a DC basis or some personal-pension-based form of group insurance, whereas 13 per cent would let their employees buy personal pensions (in some cases, with an additional contribution from the employer).

Looking ahead, only 31 per cent of firms envisaged operating a 'pure' DB plan by the year 2010. The great majority would envisage offering some kind of DC plan or a hybrid DB–DC plan (such as a base 'defined' benefit supplemented by a target-benefit-type money purchase arrangement). It should be noted that this survey was undertaken before the Pensions Bill of 1995, which intends to introduce a tighter regulatory environment for DB plans and may make greater demands on DB plans by solvency requirements and by introducing capped, plan-funded indexation both of preserved benefits and of pension payments post-retirement. These provisions might serve to make providers still more wary of the DB plan type, although of course the survey will have taken place in circumstances when legislation was envisaged, without the exact details being known.

The William-Mercer–CBI data set provides some evidence on the characteristics of the sample such as industry, firm size, dependency ratio and a variety of attitudinal questions; the sample is fully anonymised. Further

statistical analysis of the data set (details are available on request) show the following features:

- A *logit regression* of the probability of a company *currently* offering a ‘pure’ DB scheme suggests that firms that introduced or altered their plan since 1988 are much more likely now to offer a DC plan or a DC–DB hybrid plan instead of a DB plan. Specifically, if the probability of offering a DB plan was 80 per cent amongst the sample, the probability of offering a DB plan if the plan was introduced since 1988 had fallen to 20 per cent (compare with the discussion of the US above).
- Large firms and firms with fewer part-time workers are more likely to offer DB plans, but neither effect is strongly significant. Companies that think the issue of shortening tenures of workers is an important trend are (perversely, but not quite statistically significantly) more likely to offer a DB plan; companies that believe the growing trend to part-time work important are significantly less likely to offer a DB plan as opposed to some other type.
- A *multinomial logit* analysis of possible projected types of *future* pension coverage suggests that companies that expect to have a ‘pure’ DB plan in 15 years’ time have a higher current dependency ratio of pensioners to employees (this is probably a ‘maturity effect’). Companies that expect to offer a ‘pure’ DC (COMP) plan are much more likely to have introduced their pension plan since 1988. The possibility of future ‘hybrid’ DC–DB plans is weakly and positively linked to whether the plan was introduced since 1988, the size of the company, the proportion of part-time workers and the dependency ratio.
- The multinomial logit also addresses the smaller number of companies that envisage either offering no pension coverage at all in the future or simply contributing to their employees’ personal pensions. The former are significantly likely to have more part-time workers.¹¹ The latter (personal pension contributors) are significantly smaller companies that are more likely to have introduced their current pension scheme since 1988.

Thus current trends in the labour market, and the more liberal contracting-out regime since the Social Security Act 1986, are the factors behind the steady shift away from the traditional ‘final salary’ DB plan.

¹¹ This is despite, or perhaps a consequence of, recent court judgements which have deemed the exclusion of part-time workers from occupational pension schemes discriminatory.

IV. COSTS OF REFORMING AND EXTENDING PRIVATE PENSION PROVISION

In considering 'practical' reform issues, it is useful to start by considering the costs (in terms of additional contributions) of greater generosity of DB plan provision, given the maintenance of the 'final salary' form, and compare the distributional consequences of alternative DB 'packages' with those of a generic DC plan form. It is then useful to consider the 'portability' cost in greater detail, focusing on the consequences of alternative indexation (revaluation) procedures and the use of lifetime average rather than final earnings.

1. Cost of Alternative Final Salary Provisions

Disney and Whitehouse (1994) consider the empirical 'DB versus DC' question, but the calculations contained there permit some comparison also of DB plan types. That paper uses actual occupational pension scheme tenures for some 3,500 individuals aged 55 to 69 surveyed by the 1988–89 Retirement and Retirement Plans Survey (Bone, Gregory, Gill and Lader, 1992). Since each separate pension scheme tenure is reported (individuals may belong to more than one scheme in their lifetime), around 5,000 pensionable jobs are obtained which, allowing for transferability, leaves us with 3,696 pension scheme tenures. These tenures are all in DB plans; unfortunately, the exact details of the DB plan covering each individual were unavailable in the Retirement Survey.

The absence of actual DB plan types matched to individuals might seem a drawback. In fact, for the present context, this defect proves a boon: the study calculates prospective benefits from these pension scheme tenures for stylised versions of *each* of the 10 commonest forms of DB plan provision observed in the 1987 (eighth) Survey of Occupational Pension Schemes undertaken by the Government Actuary's Department (GAD, 1991), and then, for an assumed rate of return (a real return of 3½ per cent per annum), calculates the contribution rates that, in fully-funded steady state, would be needed to finance those DB plan benefits for each of these 10 DB plan types. These contribution rates are not actual rates, since they are applied to *all* covered individuals in the survey. Actual rates will depend on the characteristics of the particular individuals in any given plan. But the method used here permits a comparison of DB plan types without worrying about these differences in individual characteristics, so that the exact 'cost' of any change in the benefit formula can be appraised. It should also be noted that the calculations require simulated lifetime earnings histories for each individual in the survey (see Disney and Whitehouse (1994 and 1995) for further details).¹²

The analysis also abstracts from additional insurance provided by the DB plan in the form of early retirement provisions, eligibility for ill-health

¹² One particular stylisation is that the provision of lump sums is ignored.

retirement and spouses' benefits. These costs may be substantial, which implies that the total contribution levied on employee and employer to finance the full range of plan benefits may be of the order of 20–25 per cent of gross earnings.¹³ However, although such benefits are typically part of the DB plan 'package', they could in principle be separated from the 'core' provision of pension benefits, which could be offered in any form, whether DB or DC.

Table 2 reports a number of results from these simulations of pension scheme benefits utilising the Retirement Survey individuals' pension scheme tenures. Column 2 describes the main characteristics of the simulated pension schemes 1 to 10. The code is described at the foot of the table: thus Scheme 1, denoted '60 60 Y Y', is a scheme with a normal retirement age of 60, with a one-sixtieth accrual fraction, which indexes benefits post-retirement to inflation and is integrated with social security. Scheme 10, denoted '65 80 N N', is a scheme with normal retirement at 65, with a one-eightieth accrual fraction, which is not indexed to inflation post-retirement and which is not integrated with social security. The characteristics of the other schemes are apparent by analogy.

Column 3 of Table 2 shows that Scheme 7 is the commonest type of scheme, accounting for 35 per cent of all DB *members* (not schemes) observed in the GAD survey of schemes. Column 4 then calculates the equilibrium contribution rate that would have to be levied to finance the calculated pension accruals, given the simulated earnings of scheme members, under two scenarios. In column 4a, termed 'no indexation', it is assumed that the pension entitlements of early leavers are not indexed to inflation and are thus kept constant in nominal terms. In column 4b, termed 'full indexation', it is assumed that the pension entitlements of early leavers are fully indexed to inflation, although, of course, if nominal earnings are rising faster than prices, there is still a 'penalty' attached to early leaving (we discuss actual indexation arrangements in section 2). Naturally, 'full indexation' requires a higher contribution rate, given that prospective benefits are higher, than 'no indexation'.

Finally, column 5 describes the proportion of DB plan members who would be financially better off if their plan contributions were simply invested in a DC (money purchase) format earning the same 3½ per cent return per annum. Again, the main beneficiaries would be early leavers, while individuals who survived to, or close to, retirement age would benefit from the 'backloading' of benefits intrinsic to the DB plan.

¹³ Another reason why current contribution rates are higher than the 'equilibrium' rates calculated here is that the data are of retrospective scheme entitlements for individuals who were typically near retirement age at the time of the survey and who, given the development of occupational pension schemes in the 1950s, will typically have had rather shorter tenures than current participants might expect to have by the time that they retire in the future.

TABLE 2
Costs of Alternative Provisions in Occupational Pension Schemes

(1) <i>Scheme number</i>	(2) <i>Scheme type^a</i>	(3) <i>Percentage of covered workers</i>	(4) <i>Contribution rate (%)</i>		(5) <i>Percentage better off in DC plan</i>	
			No indexation	Full indexation	No indexation	Full indexation
1	60 60 Y Y	2.4	8.3	11.0	64	53
2	60 60 N N	4.9	10.4	14.0	60	46
3	60 60 N Y	4.8	7.1	9.5	64	53
4	60 80 Y N	22.1	9.3	12.5	60	46
5	65 60 N N	10.6	6.5	10.2	59	47
6	65 60 N Y	11.7	4.1	6.4	64	53
7	65 80 Y N	35.2	5.6	8.9	59	47
8	65 80 Y Y	1.1	3.8	5.9	64	53
9	65 80 N N	5.4	5.2	8.2	59	47
10	65 80 N Y	1.9	3.1	4.9	64	53

^a Code: Denote the categories *a b c d*:
a is the year of normal retirement;
b is the accrual fraction 1/*b*;
c is whether the plan indexes pension benefits post-retirement fully to inflation (Yes/No);
d is whether the plan is integrated with social security.

2. Results

Some comparative exercises can now be carried out using Table 2. For example,

- By comparing Schemes 1 and 3, we can see the impact of introducing post-retirement indexation of benefits to inflation. This raises the required contribution rate by between 1.2 and 1.5 percentage points (columns 4a and 4b).
- Deferring retirement age from 60 to 65 reduces the required contribution rate considerably — by around 3 percentage points (compare Schemes 3 and 6).
- Integrating benefits with social security reduces the contribution rate significantly (for example, compare Schemes 5 and 6), from 2.4 to 3.8 percentage points depending on how early leavers are treated. Note also that *unintegrated* schemes tend to reduce the inequality of net benefits in DB plans: a greater proportion of beneficiaries would be better off in a DC plan, for a given contribution rate, than in an integrated DB scheme. This is because early leavers get relatively lower benefits, and where these benefits

are also integrated with social security, a DC plan that offers no penalty to early leavers and no integration is more attractive.

- Not surprisingly, a lower accrual fraction (one-eightieth instead of one-sixtieth) reduces the equilibrium contribution rate significantly. But it should be noted that the majority of one-eightieth schemes also offer full post-retirement indexation whereas one-sixtieth schemes do not; there is a trade-off as to whether the pension is received with a higher nominal value up front and no indexation, or the reverse. Comparisons of, for example, Scheme 2 with Scheme 7, or Scheme 3 with Scheme 8, suggest that the higher accrual fraction is worth more (given the higher contribution rate) than the post-retirement indexation arrangements, but it should be borne in mind that the government also has partial responsibility for indexation post-retirement via the commitment to index the guaranteed minimum pension (GMP) component of the occupational pension (although in the light of the current Pensions Bill, this responsibility will not exist in future if the GMP is abolished).
- Full indexation to prices of early leavers' benefits raises the equilibrium contribution rate from that with no indexation very substantially (compare columns 4a and 4b), typically by about 40 per cent (*not* percentage points). Full indexation also serves to alleviate the skewed nature of DB plan benefits towards those with long tenures and high final salaries, by 'revaluing' early leavers' benefits. This is illustrated in columns 5a and 5b, which show what proportion of individuals (*assuming an equal contribution paid and an equal rate of return on the fund*) would have been financially better off had their contribution been invested in a DC 'money purchase' plan rather than in a DB plan. Typically, with no indexation of preserved benefits, up to two-thirds would be better off in a DC plan, whereas the ratio is split approximately 50/50 with full indexation. (We discuss actual past indexation arrangements, which lie somewhere in between with the balance shifting towards full indexation over the years, below.) Also recall that integration with social security also shifts the financial balance in favour of DC plans for many early leavers.

3. Portability and Preservation of Pension Rights

As has already been mentioned, one of the key issues in occupational pension provision is the question of preservation (deferral) of pension rights for early leavers and portability. If pensions are not fully portable, early leavers in DB schemes are potentially penalised in a number of ways:

- (i) Calculation of pension rights on final salary in each job, rather than at retirement, will lead to lower benefits if there is real earnings growth over the life cycle.

- (ii) If there is a vesting period of scheme membership before which pension rights accrue (typically two years or less in the UK), then turnover during the vesting period causes loss of benefits.
- (iii) If preserved (deferred) benefits are incompletely indexed to real earnings growth or real return (the former is the underlying growth rate of the accrual of DB plan benefits, the latter of DC plan benefits), then early leavers are penalised relative to stayers. The rules governing preservation are complicated and have changed frequently in the UK in recent years. They are discussed below.
- (iv) There may be costs or penalties in calculating transfer values to other pension schemes (including DC instruments), or welfare costs of remaining in an existing DB scheme when life circumstances have changed and where the individual is unable to re-tailor his or her pension scheme to these changed circumstances (such as a change in occupation or type of employment).

Of these costs, (i) can be substantial for an individual where nominal earnings growth is high (see Disney and Whitehouse (1995)), (ii) is less important in the UK than in the US, where vesting periods are typically longer, and (iv) may be partially unquantifiable. Cost (iii) requires a little more discussion. It was not until 1975 that any provision of early leavers' benefits (as opposed to return of contributions) was statutorily introduced, with preservation in nominal terms with no adjustment for subsequent inflation. From 1986, this was extended so that any rights accrued after that date would be revalued in line with the retail price index (RPI) up to a cap of an average of 5 per cent per annum RPI growth between the date of leaving and the date of pension age. From 1990, this 5 per cent per annum revaluation was applied retrospectively. It should, however, be borne in mind that the increase in the RPI (expressed as a per annum figure) has averaged 7.7 per cent for each 20-year period ending in the years between 1970 and 1990 (from R. Watson & Sons, *Long Term Statistics*).

In addition, with the introduction of the State Earnings-Related Pension Scheme (SERPS), there was a requirement that the GMP component of the occupational pension should be revalued in line with national average earnings up to 7 per cent (with the state supplementing any difference), although the 1995 pensions legislation intends to abolish the GMP for future accruals. The combination of indexation to the RPI to 5 per cent plus the revaluation of the GMP tends to leave older leavers' benefits relatively well preserved (possibly even 'over-preserved' if current salary is falling in real terms), but the penalties for younger leavers, at historical RPI growth and earnings growth, are potentially severe and are illustrated in the calculations in Disney and Whitehouse (1994 and 1995) and in Table 2.

Table 2, comparing columns 4a and 4b, shows the cost of moving from no indexation to the RPI to full indexation to the RPI, in terms of contribution rates.

These costs are substantial, raising contribution rates by between 30 per cent and 60 per cent (*not* percentage points) depending on the type of DB scheme. The cost in moving from current partial indexation to full indexation would be somewhat less than this (a rough guide can be calculated from taking Watson's figures as to actual inflation described above) but it should be noted that, even if there is full inflation-proofing, there are still costs (i), (ii) and (iv) to early leavers in DB plans, quite apart from any discrepancy between nominal earnings growth and price inflation. DB plans have not always been happy to bear the cost of statutory indexation of benefits (both pre- and post-retirement) and it is easy to see why, given the higher costs (and ultimately contribution rates) involved.

It would, of course, be possible to have a DB plan that offered immediate vesting, that calculated benefits on an average earnings basis and that also revalued early leavers' benefits in line with average earnings growth. Unless there is a very high 'excess yield' of real return over real earnings growth, however, (and bearing in mind that pension funds typically slightly underperform the stock market), it is not possible to offer the risk-free rate of return to all with a final salary basis to pension calculations coupled with full preservation of early leavers' benefits, for the reasons given in Section II, irrespective of the contribution rate. There is therefore a trade-off between the present incentive structure in final salary occupational pension plans and early leavers' benefits. The trade-off must be made explicit and not concealed behind some statement to the effect that 'provisions for early leavers have improved over the years'. This is true, but there is still likely to be a cost to early leaving when compared with the counterfactual or the return that early leaver would have received had he or she invested the *total* sum of contributions in a DC-type instrument.

4. Should Occupational Pensions be Based on Final Salary?

Much of the debate as to merits or otherwise of current DB plans, including the preservation issue, has revolved around the final salary basis of these schemes. As suggested above, if an average earnings basis were used to calculate occupational plan entitlements, the 'costs' of early leaving, although still present, would be alleviated. In this section, the consequences of shifting to an average earnings basis (with full revaluation of early leavers' benefits) are considered.

The rationale for an average earnings full revaluation basis to pension accrual (rather than the current final salary incomplete revaluation basis) assumes that the primary motive for pension provision is an insurance motive: workers demand insurance against uncertain length of life, and want this insurance to provide a known (real) annuity in retirement. This gives a rationale for occupational pension schemes if, by group provision, such insurance can be provided at lower transactions costs than in the market, and without the political

uncertainty associated with state provision (Bodie, 1990). If insurance is the sole motive, then fair insurance should be provided whether the individual is an early leaver or not: revaluation should take place whether the individual remains in the scheme or is an early leaver. Early leavers should not be penalised, as at present, by an adverse insurance outcome. In addition, a defined benefit average revalued earnings scheme also provides insurance against earnings uncertainty over the lifetime.

However, final salary occupational pension plans that backload benefits and penalise early leavers presumably exist to offer an alternative incentive structure: for example, to encourage workers not to quit, to allow the employer to reap the benefits of firm-subsidised training, and to encourage workers not to shirk at work (by raising the financial cost of dismissal). If these economic benefits are significant, as evidenced by higher productivity of members of final salary DB plans, then it could be argued that the penalising of early leavers and the backloading of benefits even for those who remain in the plan might be 'justified' in the wider macroeconomic interest even if those penalised were worse off.

Unfortunately, there is no clear evidence that final salary DB plans do in fact have this productivity-enhancing effect (Dorsey, 1995), and the suspicion must be paramount that, as with much of UK pensions policy and the development of private sector pensions, such structures evolved, and are retained, simply because 'that is the way pensions have always been provided' — usually taking the Civil Service scheme as a role model. As the economy requires greater flexibility and competitiveness, the 'traditional' final salary scheme looks increasingly archaic and, as suggested earlier, many employers are now increasingly interested in the DC plan form, in which there is no cost to early leavers and in which benefits are related to the time path of contributions and not to any arbitrary benefit formula tying benefits to a subset of the profile of earnings.

Consider also what would happen if all pension plans moved to an average earnings or money purchase basis, and yet where employers continued to want to 'backload' remuneration in such a way as to give an incentive structure that minimised worker shirking and turnover, thereby allowing the firm to reap the benefits of any training financed by the firm. It would be straightforward to 'tilt' the wage profile in some way such that longer-tenured individuals gained disproportionately higher earnings growth (Ippolito, 1991). In practice, within-grade pay is often already tilted towards more senior staff, although promotions prospects, which are generally the other source of pay increments, may dry up for older workers. Indeed, it is the double incentive of seniority pay plus final-salary-based pensions which induces older workers to remain in their posts to retirement age. Paradoxically, this double incentive to defer retirement may then prove a problem for the employer, which has to use the pension scheme as an

often expensive form of severance pay in order to persuade senior staff to leave (Lazear, 1983).

5. Are 'COMP-Type Schemes' the Way Forward?

Given the general drift towards money purchase arrangements, there has been continued discussion of whether a suitable pension vehicle is some kind of pooled money purchase arrangement across companies.

Such arrangements do exist but, as Table 1 suggests, they are pretty thin on the ground at present, although Section III implies significant potential for growth in the future. What is the rationale for such schemes and, even if there is a rationale, how could individual firms be persuaded to join or initiate group COMPS?

The first substantive point is that companies cannot be forced to introduce or engage in pension arrangements that involve firms bearing risks that they are unwilling to undertake. This seems to preclude any mandated form of universal provision by DB plan occupational pension schemes. In some industries where employee turnover rates are high, the administrative costs of calculating benefits under such plans may be substantial. Furthermore, none of the 'pensions as incentives' arguments discussed in section 4 above operate: training costs are low, shirking can simply be threatened with dismissal as there are immediate replacement workers, and productivity gains (at least in the eyes of management) may be low from inducing longer tenures by pension and other arrangements.

Nevertheless, as the relative importance of the state pension scheme continues to decline inexorably, there is a case for extending coverage by private pension provision, which would have to be of the defined contribution form. The chosen vehicle in recent years has been individual DC plans such as personal pensions. The objection to such plans (relative to COMPS) has been the 'high' transactions costs involved. Such plans usually exact an 'upfront' cost, often with a flat-rate component and a regular management charge, and there is an additional transactions cost involved in converting the lump sum into an annuity.¹⁴ It has been argued by some critics that these charges are too steep (although not dissimilar to charges on other common financial instruments, such as endowment mortgages, which do not seem to have generated the same heat at the time of writing).¹⁵ In contrast, it is asserted, COMPS may benefit from 'economies of scale' in management and (if work-forces are more homogeneous

¹⁴ For a description of charging structures for all personal pension providers, see Walford (1994).

¹⁵ Note, too, that this assertion as to the limitation of the personal pensions vehicle stemming from high charges is not uncontentious: with almost 100 providers, there are virtues in 'shopping around', and competition should eradicate margins. Furthermore, over time, operating costs can be expected to fall substantially due to 'natural selection', competition and 'learning by doing'. For example, in Chile, where the pension scheme was converted to an individual money purchase basis, commission charges have been reduced by 85 per cent in the decade since its inception in 1982: see World Bank (1994, Chapter 6, especially Figure 6.1). Finally, it is always possible to regulate charges if there is clear evidence of collusive oligopoly.

than individual applicants for personal pensions) from lower costs in calculating contribution and annuity rates (Davies, 1993).

A second advantage that is sometimes put forward for COMPS instruments is that, being employer-provided, the employer will provide a matching contribution to the employee's contribution. It is sometimes (entirely spuriously) suggested that a drawback of personal pensions is that employers do not match contributions. Even if this is true, it seems ill-considered to blame the instrument when the fault is with the employer. In any event, such a criticism contradicts a prediction of the analysis of competitive labour markets that the *total* remuneration package of otherwise identical employees should be the same. That is, employers who provide a large employer's contribution into the pension fund will, other things being equal, offer lower basic pay. The argument against employee-contribution-only personal pensions is therefore more subtle: that if individual employers provide cash rather than a pension contribution, and the individual employee is myopic, then the individual will underinvest in the pension. This is a paternalist argument and not an argument against the instrument *per se*.

A possible practical model might be an augmented version of the arrangements in the US known as 401k plans, such that they could be offered by groups of employers as well as by single employers. Established in 1978 in the US, 401k plans are employment-based retirement savings accounts; that is, firms must choose to sponsor 401k plans before individuals are eligible to join them. Lump sums (and therefore the annuity conversions) depend on individual employee contributions (as with personal pensions) and there is a similar tax treatment. However, many firms provide matching contributions to such plans of between 25 per cent and 100 per cent of employee contributions, averaging 5–6 per cent of salary bill. There are limits on tax deductibility imposed by the Internal Revenue Service (IRS), and employers will often impose their own ceilings on matched contributions. Investment options are determined by the employer but, while they may require some purchase of the employer's stock (so that such plans partly function as an indirect profit-sharing instrument), the portfolio usually includes bond and mutual fund (unit trust) holdings. If the employee leaves the firm, there is usually a small penalty in extracting the 401k holding, but the costs of leaving plans are generally much less than those for DB plans in the US, which do not generally index early leavers' benefits at all.¹⁶ Such schemes have proved very popular in the 1980s and early 1990s, accounting for almost \$50 billion of saving in 1990 — over 1 per cent of GDP and a third of net private sector saving in the US.

The concern as to the applicability of such an instrument to the UK (it is not unlike an employer-provided personal pension) is that such a scheme might not be offered by small employers — it is obviously most attractive to employers

¹⁶ For further details, see Engen, Gale and Scholz (1994).

who can permit self-investment, although the tax advantages permit any company to construct remuneration packages so as to reduce the individual's tax liability. In the case of smaller companies, in so far as share valuations for small and medium-sized companies exist (many are not floated), they may have undesirable risk properties for employees.

Thus there has to be a financial incentive to employers to group together to offer such a plan, or other proposed 'industry schemes', as well as appropriate legislation. The natural advantage is the more favourable tax treatment of the remuneration package, but the UK's PAYE system may not render the tax advantages of such savings instruments as transparent as in a self-assessment regime such as the US's. Furthermore, the adverse impact on the government's tax revenue may preclude the government of the day from encouraging the spread of private pension coverage through the work-force by extending tax shelter arrangements. In the absence of such firm-specific tax incentives, it is perhaps not surprising that the DSS itself has taken on the 'clearing-house' role in administering personal pensions, rather than requiring some employer-based scheme of COMPS for all employers. Nevertheless, if introduced, 401k-type arrangements might seem increasingly attractive to employers who would otherwise consider operating a 'traditional' occupational pension scheme, since they reduce the firm's commitment (for example, to absorb investment risk), potentially increase the flow of funds into the company's share value, take advantage of recent high real returns in capital markets and at the same time, by suitable portfolio diversification and tax advantage, provide a degree of insurance to the employee.

V. CONCLUSIONS

Employer-based pension schemes will continue to be the main source of private pension provision, but the growth of both individual and group money purchase arrangements will change the pattern of provision in the future. This paper has considered some aspects of this gradual shift away from the traditional final salary defined benefit plan: the extent of the change, the sort of firms that are thinking of alternative pension types, and their predicted future arrangements.

Final salary defined benefit schemes will have to respond to these changes; the pressures for greater flexibility and portability, and for a less uneven spread of scheme members' benefits, will grow. The paper has considered how much some standard 'reforms' of final salary schemes would cost, and also who would benefit *within* final salary schemes from moves to structures that more closely imitated money purchase outcomes. Finally, the paper has considered possible extensions of money purchase arrangements to sectors of the economy where private pension coverage is weak, as an alternative or supplement to existing individual defined contribution plans (personal pensions). The 401k plan in the US was described, as a possible model for such schemes.

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