

Agenda

Advancing economics in business

The shift towards defined-contribution pensions: are the risks overstated?

There is a clear shift towards pensions in defined-contribution form, although the nature, extent and pace of the shift differ between Member States. This article examines the risks and advantages of DC pension schemes, focusing on one key aspect of pension scheme design—namely the framework for DC pension investment

The pension landscape in Europe has been, and continues to be, undergoing significant changes. These changes have led to a shift towards individuals having to take more responsibility for the provision of adequate income for their retirement. This shift manifests itself in two main ways, as described below.

The shift to defined-contribution pensions

- 1 **There is greater reliance on private sector pensions to substitute or supplement state pension benefits.**
- 2 **Pension schemes increasingly take the form of defined-contribution (DC) schemes, in which individuals' retirement wealth depends on the contributions made and the performance of the investments in capital markets, as opposed to defined-benefit (DB) schemes, in which the scheme sponsor guarantees a certain income level (usually in the form of an income replacement rate) at retirement.**

The shift towards pensions in DC form is occurring across Europe, although the extent, nature and pace of the shift vary between countries. Existing DB pension schemes offered by employers are being restructured and/or new schemes introduced that are mainly of DC-type, including in those countries where private pension provision has historically not been significant. Given that the shift towards DC is an economic reality and DB pensions are not, and may not become, accessible for many individuals, the relevant policy question is how DC schemes can be designed to deliver effective retirement provision for individuals.

This article considers DC pension schemes, and focuses on one key aspect of pension scheme design—namely the framework for DC pension investment. It draws on Oxera's recent study for the European Fund and Asset Management Association. Using evidence on the growth

and structure of DC occupational pensions schemes emerging in the EU, the report examines not only the investment framework but three other aspects of scheme design which are not examined in this article: the measures introduced to facilitate individual choice and decision-making; scheme governance; and the scope for cost efficiencies in pension provision.

Advantages of DC schemes

The shift towards DC has been subject to extensive commentary and much criticism—often unfounded, since, as discussed below, the risks associated with DC schemes are often overstated while their advantages are often downplayed. As such, there is sometimes a mismatch between perception on the one hand, and economic reality and the fundamental characteristics of different pension scheme structures on the other.

Pension provision is not a free lunch

All pension arrangements are premised on the payment of income at a future date. In a funded system, assets accumulate to meet the cost of future pension payments, and for a pension scheme to be self-financing, the contributions made to the scheme in the accumulation phase, plus the return on the investments, must generate an accumulated asset value that matches the value of pension payments. This applies to all types of funded pension scheme, regardless of whether the scheme is defined as DB or DC. However, contribution rates to DB and DC schemes tend to differ in practice. For example, where the shift from DB to DC is explained by the need of employers to reduce their pension costs, it is often accompanied by a reduction in the overall value of the pension contributions and, therefore, a reduction in pension benefits. Lower contributions imply lower levels of retirement wealth but for reasons that have little to do with the shift to DC pensions per se, as discussed below.

This article is based on the Oxera report 'Defined-contribution Pension Schemes: Risks and Advantages for Occupational Retirement Provision', prepared for the European Fund and Asset Management Association, January 2008. Available at www.oxera.com.

All types of pension carry risk

The fundamental difference between DB and DC pensions relates instead to the allocation of risk between the parties. The main source of risk to an individual in a DC scheme is investment performance—for a given level of contributions, asset accumulation in the individual account depends on financial market returns and the chosen investment approach. In a DB scheme, this risk is borne by the sponsoring employers who will have to change their level of contributions as the investment returns vary in order to fulfil their pension obligations.

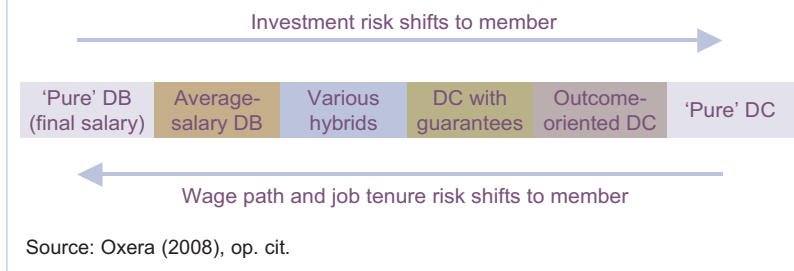
While pure DC schemes expose individuals to investment risk, they are not necessarily riskier for individuals than DB schemes. The latter expose individuals to other types of risk, and this riskiness is often underestimated.

- DB schemes tied to the final years of earnings expose individuals to risk associated with changing wages and jobs during their career. As confirmed in a growing body of academic literature, DC schemes, where contributions depend on life-time earnings and pension rights tend to be more portable, can deliver better value (in terms of what individuals will get for their direct and indirect contributions) if the wage path is uncertain and job mobility high.¹
- In DB schemes, there is a risk that employers may reduce promised pension benefits ex post (eg, in the event of bankruptcy). Employees are exposed to this risk unless a mutual guarantee scheme has been set up (or another subsidy or bail-out mechanism exists) to pick up the pension liabilities of the insolvent employer. If investment in company stock is restricted and assets are properly segregated, default risk is not an issue for DC schemes.
- DC schemes can have advantages in terms of the control they give individuals over their pension assets, allowing them flexibility and choice to adjust their pensions in line with their needs and preferences. DB schemes, on the other hand, require individuals to accumulate the pension in the form of deferred life annuities and thus limit the risk–return choice. While there are valid concerns about the ability of individuals to exert choice and make the right decisions, this does not necessarily imply that a DB pension provides them with the more optimal outcome.

There is a spectrum of risks and scheme structures

Pension scheme design can vary in how the different risks are allocated, and the stylised pure DB and DC

Figure 1 Illustration of spectrum of risks and scheme structures



schemes can be regarded as two ends of a broad spectrum along which lie a variety of arrangements that differ in their allocation of risks (see Figure 1).

- DC schemes can be structured to achieve specific target outcomes or reallocate the investment risk away from the scheme member—eg, by implementing a minimum-return guarantee by the sponsoring employer or a financial institution.
- In DB schemes, the scheme sponsor can assume the wage path or job tenure risk that would otherwise be borne by the individual by adopting average-salary schemes rather than a benefit formula that depends on final salary only.
- Through implementing hybrid arrangements, the plan sponsor can shift some, but not all, investment risk to individual members. Such arrangements include, for example, sequential or combination hybrids where a member can join a DB scheme after a period of DC membership, or where they are accruing both DB and DC benefits.

The distinction between DB and DC is blurring somewhat, with DB schemes shifting towards structures that have a DC element, or DC schemes being structured (eg, through guarantees or specific investment strategies) to replicate DB-type outcomes. Thus, the pension structures that are emerging involve a diverse and often complex set of allocations of risks (and responsibilities) between individual scheme members, employers and financial institutions, which often cannot be unambiguously described as being either of DB- or DC-type.

Investment risk in DC pension schemes

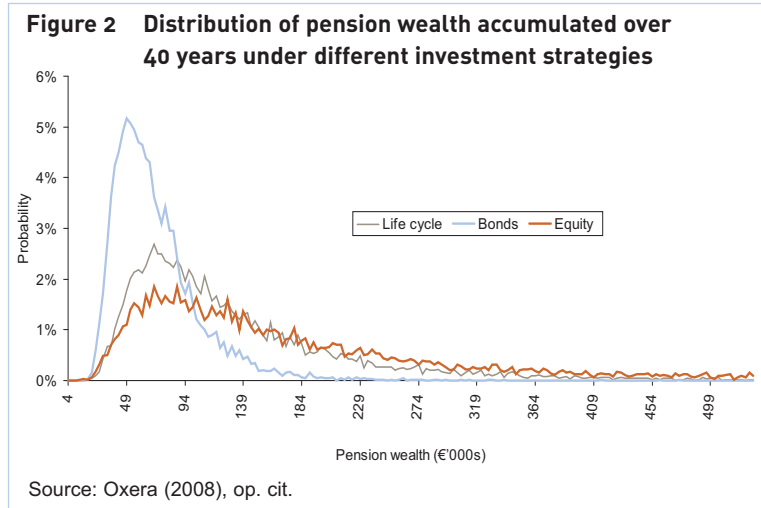
DC pension schemes are in essence vehicles for long-term savings and investment. Contributions are paid into individual accounts and invested over the long term to deliver a pension upon retirement. For a given level of contributions, the level of retirement wealth accumulated depends on the net investment returns accrued in the account, and hence the performance of the investments in financial markets.

Investment risk in DC schemes can be mitigated, either by investing in 'safer' assets or by shifting the risk to another party (eg, a financial institution providing a guarantee). Indeed, in a number of countries, regulation imposes minimum guaranteed returns or other constraints on pension investment. The result of such regulation may be investment that is excessively conservative or inappropriate for a long-term pension investment horizon.

- 'Safer' assets (eg, government bonds) may have lower risks, but also imply lower returns on average. Holding a significant proportion of the portfolio in equity during the pension accumulation phase (or until a few years before retirement) can result in significantly higher average retirement wealth, at a comparatively small increase in the risk of receiving very low levels of retirement wealth, given the long investment horizon over which pensions accumulate.
- Minimum return guarantees limit the shortfall risk for individuals that may result from financial market volatility, but they also limit individuals' participation in the upside benefits. The cost in terms of forgone returns, and hence lower retirement wealth, can be significant if the guarantee is used throughout most or all of the pension accumulation phase.

The results of a simulation exercise undertaken by Oxera illustrate these points by quantifying what different pension asset investment strategies mean in terms of wealth accumulation for retirement.² In the base model, it is assumed that the individual (or the employer on behalf of the individual) starts to contribute to the individual account in the DC plan at the age of 25. The retirement age is 65, so the maximum investment horizon is 40 years. The assumption is that yearly contributions equal 5% of salary, which starts at €20,000 and grows annually in real terms at a rate of 2%. The modelling is in real terms. The individual account is invested in government bonds and equity. The management fee is set at 1% of assets per year, and returns in the individual account are assumed to be exempt from tax. The model is based on a simulation of real bond and equity returns, with the estimates for the parameters (ie, means, standard deviations, covariance) obtained from historical data.³ Taking the investment strategy, the contribution levels and the asset management fees as given, the accumulated pension wealth for 10,000 individuals is then simulated, based on this generalised historical pattern of bond and equity returns.

Figure 2 shows the simulated wealth distribution for three investment strategies: 100% investment in government bonds; 100% investment in equity; and a



'life-cycle' approach whereby 90% is invested in equity (10% in bonds) for the first 30 years, switching to 30% equity (70% bonds) for the remaining ten years until retirement.

The outcomes under the 100% bonds strategy are clustered at the lower end of the pension wealth distribution, whereas outcomes are more dispersed under both the lifestyled or 100% equity approach, with more pension wealth being accumulated. The differences can be significant.

- The median wealth accumulated when investing 100% in bonds is around €62,000, which is less than half of the median wealth accumulated when investing 100% in equity (around €140,000). Given the bond–equity mix, the wealth accumulated under the life-cycle approach falls in between (around €106,000).
- The probability of accumulating pension wealth of more than €90,000 is much higher when the investment contains only, or at least some, equity—72% of individual accounts that follow the 100% equity approach, respectively, accumulate more than €90,000, compared with only 20% of accounts that follow the bonds-only investment.

An important consideration in pension wealth accumulation is how likely it is that individuals will end up with very low pension wealth or, more generally, how variable the outcomes are. Based on the simulations using historical returns, an analysis of the bonds-only investment strategy in terms of the percentage of individuals worse off than the median or bottom percentiles of the equity-only strategies suggests that:

- if the entire portfolio is held in bonds, in 96% of cases the level of pension wealth accumulated is lower than the median level of wealth (about €140,000) under the

Table 1 Pension wealth accumulated over 20 years under different investment strategies

	Bonds	Equity	Life cycle
Mean	25,095	40,540	30,700
Median	23,669	34,573	28,255
25th percentile	19,233	24,964	22,383
10th percentile	16,155	18,915	18,462

Source: Oxera (2008), op. cit.

equity-only strategy. Investing in bonds delivers a 96% chance of accumulating less than €140,000, but only a 50% chance of receiving less than this amount if the portfolio is invested in equities;

- accumulated wealth under the bonds-only strategy is lower in 42% of the cases than the bottom tenth percentile of wealth (€57,000) under the equity-only strategy. Thus, investing in bonds delivers a 42% chance of accumulating less than €57,000, but only a 10% chance if the investment is all in equities.

The above results are based on a time horizon for pension accumulation and investment of 40 years. However, similar conclusions still apply if the time horizon in the simulation model is shortened to 20 years. Table 1 summarises the results of the simulations, holding all other assumptions the same, but shortening the time horizon to 20 years.

The outcomes are, on average, still better when the investment strategy involves at least some investment in equity, and even the ‘bad’ outcomes still deliver higher wealth than under the bonds-only strategy in the majority of cases. For example, for the lowest tenth percentile of outcomes under the equity-only strategy, retirement wealth is €18,915, which is still higher than the lowest tenth percentile under the bonds-only strategy (€16,155). Indeed, the probability of a worse outcome under the equity-only strategy is less than 1% for a 20-year investment period (and less than 0.1% for a 40-year period).

The aim of this is not to advocate a particular form of investment for DC pension scheme assets—the

simulations are after all based on a set of assumptions, including historical risk–return parameters that may not hold going forward. Rather, the point is a more general one: there is a trade-off between risk and return, and limiting risk usually comes at the cost of forgoing potential returns and retirement wealth. The cost can be particularly high if the pension assets are invested in ‘safer’ or guaranteed investments over most or all of the pension accumulation phase. Diversifying instead into equity can deliver higher returns, at comparatively low risk, not in the short run but over the long time horizon, which characterises pension investment.

Concluding remarks

In DC pension schemes, investment risk is borne by individual scheme members. This risk can be managed, and DC schemes can be designed to deliver outcomes along the broad risk–return spectrum. While there are valid policy concerns about pension benefit adequacy, policymakers should consider the cost of imposing minimum-return guarantees and other constraints on pension investment. Such constraints can imply significant forgone returns and hence lower average retirement wealth for individual scheme members. In addition, over long time periods, the additional reduction in the risk of an unfavourable outcome that is actually achieved by investing in ‘low-risk’ securities may be minimal. Constraints on pension investment restrict the risk–return set available for individual scheme members and may result in a lack of innovation in the product range offered in the market.

Product solutions are being developed in the market that are designed to suit the retirement needs of individuals and their risk–return preferences, ranging from life-cycle investment approaches to tailored investment solutions that seek to achieve specific retirement outcomes for individuals, taking account of relevant factors such as age, retirement date or the expected public pension of individuals. Further research into how DC pension investment can be tailored to meet individuals’ retirement needs would no doubt be useful, and new product solutions are likely to develop accordingly.

¹ A simplified example can illustrate this point. A worker who accumulates four periods of final salary DB pension benefits with four employers, where the reference salary is the (real) final salary that the worker has with each employer, will receive less pension than someone with exactly the same wage path who stays with the same employer, if their real wages increase with age. With a salary of 20,000, 25,000, 30,000 and 35,000 at the end of each subsequent ten-year period, and a defined benefit of 1/80th of the final salary per year worked, the job mover obtains a pension of 13,750, compared with 17,500 for the worker who stayed with the same employer.

² The detailed assumptions and further results are described in Oxera (2008), ‘Defined-contribution Pension Schemes: Risks and Advantages for Occupational Retirement Provision’, a report prepared for the European Fund and Asset Management Association, January.

³ Barclays Equity and Gilt indices are used; annual total returns, including income reinvested, on these indices are provided in Barclays Capital (2006), ‘Equity Gilt Study 2006’. Estimates for 1900–2005 are used. In this period, mean (arithmetic average) log real returns for equities and bonds were 5.14% and 1.15%, respectively; standard deviations were 19.4% and 13.2%; and the covariance between equity and bond returns was 1.54%. The results for different time periods would have been similar. For example, estimates for 1950–2005 would have been: 6.75% and 1.34% mean real log returns for equity and gilts; 22.85% and 12.56% standard deviation; and 1.6% covariance. Although simulations are parameterised with estimates based on log real returns, the simulated series are transformed back to levels, and the return on investments is then calculated.

If you have any questions regarding the issues raised in this article, please contact the editor, Derek Holt: tel +44 (0) 1865 253 000 or email d_holt@oxera.com

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