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# THE SHIFTING FACE OF WORKPLACE PENSIONS

The retreat of employers and  
growth of defined contribution

By Anthony Neuberger





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growth of defined contribution

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February 2014

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# Introduction

Public policy is no longer – if it ever was – a matter for governmental persons and institutions alone. In an increasing number of fields private, particularly corporate, actors take decisions that have general (that is public) implications. Public policy debates therefore need to be addressed to these actors too. Also, and again in many fields, citizens will often gain from seeing the contributions that academics and policy advisors make to these debates. There can be very few policy issues to which these observations apply more forcibly than retirement pensions. While they are of vital importance to everyone fortunate enough to survive to retirement age, the details of pension plans and provisions are steeped in highly complex, often impenetrable, technicalities. Further, at present pensions of all kinds – public, occupational and private – are undergoing bewildering changes, with the debates around them often carrying an atmosphere of panic with warnings of the financial insupportability of an ageing society, of ‘demographic time bombs’, and of the imminent end of pensions as we have come to know them. Although certainly a field of public policy, retirement pensions are also at the centre of the process of the extension of policy beyond the circle of public authorities, as private firms become increasingly involved in their provision (or, often, non-provision).

Pensions are therefore an ideal topic for a contribution to public policy debate that addresses public- and private-sector decision makers alike. Public policy makers also need to be informed of the dilemmas and questions that confront private-sector designers of pension schemes, as the characteristics of these will have general social implications, affecting as they do the lives and living conditions of very large numbers of citizens. And citizens would be well advised to gain an understanding of what all this change and decision-making means for them.

It is with all these considerations in mind that the British Academy offers Anthony Neuberger’s *The shifting face of workplace pensions* for public

policy debate. The document was originally produced as part of a wider programme of work on pensions that formed one branch of a research project on uncertainty and sustainability in labour-market and social policy. This was a project within the European Commission's Framework Programme 7 for policy-related research on a range of social questions. Given the acronym GUSTO, the project's full name was The Governance of Uncertainty and Sustainability: Tensions and Opportunities. In addition to pensions, its various branches studied issues of uncertainty and insecurity, and policies for confronting them, arising from individuals' labour market transitions, immigration, collective bargaining, local economic development, and EU social policies themselves. Co-ordinated from the University of Warwick, GUSTO involved research teams based in Belgium, the Czech Republic, Denmark, France, Germany, Hungary, Italy, the Netherlands, Spain, and the UK and, outside Europe, Canada. Individual research workers came from a wider range of countries.

This publication is therefore rooted in an international context and brings a comparative range to a policy field that is itself increasingly an international one. Rarely do pensions policy initiatives exist in a hermetic national bubble, especially where multi-national employers and pension-providing firms are involved. This wider context is therefore necessary to an understanding of the issues in any one country. This applies pre-eminently to the on-going shift from Defined Benefits (DB) to Defined Contributions (DC) bases for pension schemes that is our focus here.

These terms themselves are part of the complexity surrounding pensions. DB schemes are those that correspond to most past and still current understandings of pension arrangements. Usually in exchange for regular, income-based contributions from an employee and similar contributions from the employer, the former's eventual pension is based on a formula relating to years of contribution and eventual salary. There is no direct relationship between contributions and benefit. Under DC schemes, in contrast, the employee and perhaps the employer still make regular, income-based contributions, but the pension that is eventually achieved depends on the value of the assets that have been purchased during the employee's working life. The relationship between contributions and benefit is direct, but there is no formula that determines in advance the size of the pension.

There is currently a major shift in progress from DB to DC schemes. The differences between them are profound, in terms of costs, freedom of choice, and degree of security. Both types embody a mixture of



predictability and unpredictability, but they occur at different points. In a DB scheme the final pension is predictable, but not the actual value of the assets that the contributions have purchased; in a DC scheme it is the other way round. Some of these differences can be smoothed out through various hybrid schemes, such as 'notional DC'. Hybrids necessarily increase the complexity, but also make possible combinations of scheme elements that might come closer to optimizing the preferences of employees and employers. The purpose of this publication is to give some guidance to the choices embedded in these various alternatives.

Although the coming years are highly likely to see a major expansion of DC schemes, at present they account for only a small proportion of total pension assets in most countries. Acquiring knowledge of them in practice, the advantages and drawbacks of their various forms and hybrids, therefore requires gleaning information from experience in a number of national cases. This is what Anthony Neuberger has done in this publication. He tackles such issues as: the extent to which participation in pension schemes should be voluntary, and how contributors can make choices within schemes; how respective employee and employer contributions are to be fixed; what investment strategies and balances of risk are appropriate for pensions contributions; whether and how risks should be shared, and whether any level of pension can or should be guaranteed in a scheme based on actual asset values; and how the pension should finally be paid out (or 'decumulated' in the jargon) – as lump sums, annuities, or as regular timed withdrawals as common with DB schemes. Finally, he considers the issues of governance raised by relations among contributors, employers, and commercial fund providers.

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## Executive summary

The changing landscape of pension schemes across the world – the shift from public to private, the shift from defined benefit (DB) to defined contribution (DC) schemes – has been widely discussed and analysed. But within DC schemes there are many alternative structures and choices, ranging from “classical” DC which is essentially an individual savings account with tax privileges to collective DC which is much closer to traditional DB. This paper is intended as a useful guide for policymakers, exploring the role of occupational DC, identifying the choices and trade-offs. The document was originally produced as part of a European Commission funded project on uncertainty and sustainability in social policy. The focus is therefore international, but in a separate section the implications for the UK are addressed.

The paper first compares DB and DC pension schemes, highlighting the strengths and weaknesses of both types of scheme. It concentrates particularly on the micro-economic aspects, and examines the economics of paying employees through pension rights rather than giving higher cash wages. The second chapter surveys DC schemes in selected countries around the world, highlighting the multiplicity of designs and the interaction between the different features. The paper then looks at the principal design areas (contribution rates, investment policy, decumulation and scheme governance) of occupational DC schemes. Finally, the paper offers some observations on the current pensions debate in the UK. The main conclusions are that:

# 1

The role of employers in occupational pension schemes is crucial. In a free market, why do employers provide pensions? Why not pay higher cash wages and leave employees to buy their own pensions? The academic literature argues that DB schemes create value in the areas of recruitment, retention and retirement. These gains are largely absent with DC schemes. The main gain in occupational DC schemes comes from the greatly reduced transaction costs associated with collective rather than individual provision.

# 2

The main advantages of a classical DC pension are simplicity, transparency and flexibility. It is simple because the pension is simply an individual savings account comprising a portfolio of financial assets. It is transparent because its cash value is clearly defined and changes only as contributions and investment income flow in, and asset prices change. It is flexible because the contribution level and risk profile are both under the control of the individual, and because the fund can be transferred to another scheme or manager at essentially no cost.

# 3

The disadvantages of DC are the converse. The simplicity and transparency expose the individual investor directly to the volatility of the market prices of financial assets. The flexibility may lead myopic individuals to under-provide for their own needs.

# 4

Careful design of default options provides a way of mitigating the disadvantages without losing the advantages of DC. Auto-enrolment into pension schemes with a standardised contribution rate and an automatic investment allocation helps reduce under-provision, and assists people who do not value the flexibility offered by DC.

..... 5 .....

The design of the default investment allocation is important because evidence suggests that most people will use it. It is likely to remain controversial as our understanding of the risk and return of different asset classes is poor. But the optimal strategy seems bound to include a large exposure to risky, higher yield assets not only during the accumulation phase but also well into the decumulation phase.

..... 6 .....

Guaranteed rates of return, given either by the employer or by a financial institution, are an unattractive way of dealing with uncertainty. They add complexity. They greatly reduce flexibility and transparency since their value is hard to determine. If the objective is to reduce risk, the alternative of investing in lower risk assets is preferable.

..... 7 .....

Collective DC offers a more radical way of dealing with uncertainty. In part the gain is cosmetic – the member’s attention is focused on the contribution rate and on the expected level of pension, both of which vary only slowly over time, rather than on the more volatile value of assets. The ability to transfer money between cohorts offers the possibility of inter-generational risk-sharing. The downside is the loss of most of the strengths of classic DC: simplicity and transparency are lost as pension levels depend on the finances of the scheme as a whole. Flexibility is lost as contribution rates are fixed and do not reflect individual circumstances and needs. The member, if dissatisfied, cannot take their money elsewhere.

..... 8 .....

In the UK, with the precipitate decline of DB pension provision, there has been growing interest in collective DC. In part this appears to be based on a faulty analysis of the problem which is seen as finding a way of sharing risk fairly between employer and employee. The history of DB pensions in this country, based on voluntary arrangements, subject to repeated legislative intervention, and now becoming extinct, provides valuable lessons in creating sustainable private sector risk-sharing institutions, as does the rise and fall of the with-profits fund.

# The shifting face of workplace pensions

Much has been written about the pensions issue, the challenges faced by existing structures, the shift from pay-as-you-go to funded schemes, the shift from public to private, the shift from Defined Benefit to Defined Contribution. The purpose of this paper is to look beyond the Defined Contribution label, to explore the variety of designs of DC, and to investigate the issues and choices, trade-offs and assumptions underlying these choices. It is intended to contribute to the debate on the future role of occupational DC.

The paper starts by rehearsing the differences in principle between DB and DC; the objective here is not to argue for one form of pension provision over another, but rather to point out the key strengths and weaknesses of the two concepts. This is crucial because many of the specific features of individual DC schemes are designed to mitigate or overcome particular problems affecting DC in general. In evaluating and understanding these features, it is useful to assess how far these changes exacerbate other problems with DC or reduce some of the distinctive benefits that DC has compared with DB. Take for example the issue of compulsion. It is widely accepted that people, left to themselves, will under-provide for their future retirement needs. A possible response is to require them (or their employers) to make a minimum contribution to their plan. But one of the key generic advantages of DC over DB is that it allows people to tailor their pension contributions to their own needs (their immediate need for cash, their own preferences between work and retirement, other family income); compulsion impedes this. Design is about trade-offs, and the purpose of this paper is to explore those trade-offs.

The following section briefly summarises the features of DC schemes that have been implemented around the world. The purpose is to under-

stand the variety of DC, and to see how the features of different designs work together. This is not intended to be a comprehensive account of all that currently exists.

The rest of the paper then focuses on the key design areas: contribution, investment, decumulation, and governance. The paper concentrates on occupational schemes – schemes provided in the workplace, and organised collectively by employers and/or employees. State schemes and individual schemes raise very different issues. The paper also ignores the macro-economic effects of pension policy – the impact of pension saving on the savings rate in the economy as a whole, and the impact of the investments of pension schemes on the development of the financial sector and the availability of finance. The penultimate section of the paper draws out some specific implications for the current debate in the UK, and the final concludes.

# 1 Generic features of DC and DB

## 1.1 The economics of pensions

To understand the economics of DC and DB pensions, it is useful to start from the fundamental issue of why employers choose to pay their employees through pension rights rather than entirely through cash wages. Payment in kind is generally inefficient. Many employees will put a value on their pension benefit which is substantially lower than the cost of providing them. Those who value the benefit above its cash cost could use cash wages to purchase the benefit from a third party provider.

One reason for provision by the employer is that it may well be cheaper to provide pensions through the workplace than through the marketplace. There are high marketing costs in selling financial products to individual consumers. Providers cannot readily distinguish themselves from their competitors; pricing and product differentiation are often opaque. Gaining market share requires heavy sales and promotion costs. Individuals may lack confidence in their ability to choose correctly. Specialist advice is costly and not necessarily trusted. If the employer, with the involvement of employees, is able to identify a supplier and a single product or suite of products, costs can be substantially reduced and trust enhanced.

A second reason that paying salary in the form of pension may be attractive to some types of employer is that it acts as a device for attracting particular types of employee. The so-called sorting theory of pensions was developed by Salop and Salop (1976). The underlying premise is that workers who place less weight on the future when making decisions ('high discounters') are likely to invest less in firm-specific human capital, to be less reliable and to leave the firm sooner than workers who place a greater weight on the future. Therefore, by credibly deferring a portion of

the workers' compensation, an employer can make a given pay package more attractive to 'low discounters' than to 'high discounters'.

A third reason is the tax treatment of pensions. The tax treatment of pensions varies widely internationally, but often incorporates substantial net advantages to pension saving. Yoo and de Serres (2004) estimate that the tax benefit to a typical taxpayer ranges across OECD countries between \$0 and \$0.40 per \$1 of contribution, with the majority of countries in the range \$0.15–\$0.30. So for an employee who wishes to save, saving through the pension route offers substantial tax advantages.

But this may overstate the financial incentive to save specifically in occupational pensions. Comparable tax benefits may be available for other forms of saving. In the UK for example, where the estimate of the tax benefit is around £0.30/£1.00 of contribution, much the same benefit could be gained by subscribing to a private pension plan (though typically with far higher running costs); there are other categories of saving (such as housing, or individual savings accounts (ISAs)) that also attract substantial tax benefits. The tax privileges also tend to come with restrictions on liquidity, limiting access to funds both before and during retirement.

These three benefits – reduced transaction costs, improved employee incentives and tax advantages – apply to all types of pension. Before we look at the specifics of DC pensions, it is worth looking more carefully at the architecture of DB pensions since these have traditionally been the predominant form of occupational pension provision in most developed countries. It is worth noting though that there are additional reasons that may make it economic to remunerate employees through a DB pension that do not apply to DC.

## 1.2 DB pension schemes

In a pure DB scheme, the worker gets certain benefit, that often include sickness, dependents and death in service cover and will include a pension payable from a certain age until death. The size of the pension is fixed according to certain rules, typically involving number of years of contribution, and final or average salary, and will have some degree of protection against inflation. It is generally the case, for reasons that will become apparent, that any contribution made by the employee to the cost of the benefit is small compared with the benefit; most of the cost is borne by the employer.



If membership of the scheme is voluntary, the choice of the worker is simple: to join or not to join. If membership is compulsory, there is no choice at all. The fact that almost all employees, regardless of their personal circumstances, will be much better off enrolling means that there is generally no need for professional advice. Marketing costs are very low. There are no competing products to be compared, there are no competing providers to choose between, and there are no decisions to be taken apart from whether to join or not. Information can be standardised.

The architecture of the DB scheme means there is considerable flexibility in the design of the benefit. In a DB pension, benefits need bear no strong relationship to contributions. Employers can use the scheme design to advance and facilitate their human resource (HR) objectives. This is important because it gives the employer an incentive to pay workers in the form of pension rights rather than cash.

There is a substantial research literature that explains common features of DB pension schemes as serving employers' HR needs. With a final salary scheme where the benefit is a product of the number of years of contribution and final salary, those who have seen substantial salary progression, and those who have stayed with the firm till retirement tend to get a higher rate of return on their contributions than those whose salary has remained stable, and those who left the firm prior to retirement. In general, the marginal pension benefit from staying working beyond retirement age tends to be strongly negative.

By offering more to long stayers, Ippolito (1997) argues that the firm saves on training and recruitment costs as well as the higher productivity of older workers. Becker and Stigler (1974) argue that by tying the pension to final salary, the pension provides strong incentives to avoid shirking throughout their career with the firm. Lazear (1979, 1983) sees the negative pension returns to employees working beyond the standard retirement age as facilitating an orderly departure from the labour force.

The implication of this economic approach to pension design is that employers will tend to design benefits to meet their needs and will not provide benefits that do not serve their HR needs unless the employees attach commensurate value to them. The security of the pension promise is a good example. Guaranteeing payments over the long term is expensive. Huang and Huang (2012) show that the difference in yield between bonds rated Baa (which are judged to be just of investment grade) and those rated Aaa averages 1.31% per annum over a ten year

horizon, despite the fact that the average extra risk of default is only 0.37% per annum. Paying an extra 1.31% per year over the average life of a pension promise of say 30 years to upgrade it from Baa to Aaa would increase the cost of providing the pension by nearly 50%.<sup>1</sup> It is not clear that employees understand how secure their DB pensions are, or that they would be prepared to pay such a high price for reducing risk if they did realise how large it was. Certainly, it is easy to understand why employers in many countries have not voluntarily ensured that their pension promises are financed in such a way as to ensure that they will be paid in full whether the employer survives or not.

DB schemes can create value for employers and employees by providing benefits such as ill-health early retirement that would be difficult for a commercial insurer to provide. A commercial insurer would be concerned about adverse selection (those people who buy insurance are likely to be those who know they are most likely to claim) whereas this is less of a concern for a DB pension scheme where the membership is essentially predetermined. The fact that the employer is the major contributor to the scheme also mitigates another major constraint on insurance design – moral hazard. So while relating the pension to final salary may be attractive to a worker who is concerned with their replacement rate at retirement, such a linkage would probably not be provided by a commercial provider who cannot readily hedge the risk of a steep rise in salary in the years prior to retirement and might also be concerned that the final salary could be manipulated by employer and employee acting in concert.

The basic architecture of the DB pension also explains why and in what areas public authorities have felt impelled to regulate schemes even if they are satisfied that scheme members fully understand the rules of the scheme and their implications when they join. The poor returns offered to employees who leave the scheme prior to retirement create a substantial barrier to labour mobility which may well impede economic growth. This is partially mitigated in industry schemes where it is only workers who switch industry who suffer.

Where a DB scheme fails, this is often seen to be a matter of public as well as private interest, so the state gets involved in trying to prevent scheme failure either by requiring some insurance scheme or by impos-

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1 The example is conservative. Many employers with pension schemes have a credit rating that is well below investment grade.

ing solvency requirements in some form. The collective nature of a DB pension scheme, with complex risk-sharing between parties makes issues of governance central. If a DB sponsor with an underfunded scheme gets into financial difficulties, the interests of shareholders, younger workers, older workers, ex-employees and retired members may all conflict, with their interests being strongly affected by the legal priority accorded to their different claims.

Regulations at national and international level to further these public goals may help support DB schemes by making sure they are seen as fair and sound. But by insisting on the provision of benefits whose costs exceed the value workers ascribe to them, they also help to undermine the economic basis for the voluntary provision of DB pensions by employers.

### 1.3 DC pension schemes

A DC pension scheme is far simpler than a DB scheme. In pure DC, the employee agrees to contribute a percentage of income into the pension fund. The employer may also make a contribution which may in turn depend on the employee's contribution. The money is used to buy units in one of a number of funds, chosen by the employee from a menu defined by the scheme. Typically the funds will be managed by a financial institution which is separate from the employer, and the fund will likely be structured as an Open-ended Investment Company (OEIC) so the employee has economic ownership of a well-defined share of a particular portfolio of financial securities. This means that the employee's pension fund has a readily ascertained monetary value at any time which fluctuates with the assets it contains. At some point the assets of the fund are liquidated and used to buy life annuities, or alternatively they are liquidated over time and the proceeds used to deliver the pension.

As with DB pension schemes, costs are substantially lower than they would be in buying an individual pension, though costs are somewhat higher than DB owing to the greater choice open to the worker. With the funds being invested in liquid financial assets, any insurance element (against death, living too long, or illness) has to be provided separately, rather than as an integral part of the pension.

As with the DB pension, paying employees through pension contributions rather than wages may attract low discounters, though the

employer's contribution to DC plans is normally relatively small, and the effect is likely to be quite limited. But DC offers few of the HR benefits that can be obtained in a DB scheme. Since each employee's fund is in effect separate there is no possibility of implicitly subsidising long stayers or those who progress rapidly in their careers, nor can it do much to ease employees out of the labour force at a particular age. On the other hand, the existence of the DC pension does not distort decisions about moving job or taking retirement in that these decisions have no effect on the present value of pension benefits accrued to date.

In a DC pension scheme, employees can tailor their contribution rate and the risk profile of their fund to their own circumstances and preferences. A worker who places a low value on pension savings is not forced to save; if the employer's contribution is tied to the worker's contribution, then the employer will not be spending resources on a benefit that the employee does not value. In a DB scheme, the asset that the worker acquires is generally some kind of deferred annuity, indexed in some way to wages, and underwritten by the employer. The worker may strongly prefer some other asset – maybe an annuity with a smaller risk of default, one which is less highly correlated with his own labour income, or perhaps a riskier pay-off which offers the prospects of a higher pension on average.

But the flexibility also has a downside. If, as many argue (see for example Laibson *et al*, 1998), people are inclined to be myopic, and do not recognise their own long term interests, then they may prefer to be forced to save for their pension through a mandatory scheme with a fixed or minimum contribution rate, and a switch to DC may lead to people having lower pensions than they would have wanted. Similarly, the flexibility to choose the risk profile of the fund may feel like an unwanted responsibility particularly if there is limited understanding of the full implications of the choices offered. Giving workers the responsibility for choosing the risk profile of their pension pots makes it harder for them to have recourse to the employer or the state when things go wrong. The issue of investment risk in DC is discussed in much greater detail in section 4.

## 1.4 Hybrid schemes

There are many possible hybrids and variants of DB and DC pension schemes. Notional DC is a non-funded model of pensions with individual accounts. The accounts are credited with contributions and earn

a notional return that is fixed by the sponsor. At retirement the accumulated balance can be converted into a cash sum or annuity. The model is seen as a way of introducing flexibility and some sense of individual ownership into traditional national pay-as-you-go DB pension schemes. It became popular following the Swedish reforms that were implemented in 1998. While the individual accounts do have some of the flavour of DC, the fact that it is unfunded, that the rate of return and the conversion of the account balance into a pension is controlled or determined by the sponsor, that the individual has no control over the investment strategy means that many of the issues raised are very different from those in more classical DC.

Another DC variant that is much closer to classical DC is collective DC. The Danish ATP scheme is a good example: it is a single national compulsory system where contributions are pooled and invested jointly. It is described more fully in section 2.4. Many of the issues are similar to those in individual DC.

## 2 International experience

The OECD statistics on pensions suggest that DC pensions currently play a relatively small role in most countries, at least when measured in terms of value of assets. With increasing demographic and fiscal pressures on public pay-as-you-go pension schemes, and with the limited prospects for expansion of occupational DB, occupational DC pensions are expected to play a rapidly increasing role in a number of countries. Certainly changes to pension systems across the world over the last two decades have seen a switch towards DC.

In this section, the structure of occupational DC schemes in some key countries is described. Non-occupational pensions (third tier), which are invariably DC, are ignored. The countries are chosen to illustrate the variety of forms that occupational DC takes. While the choice is not intended to be comprehensive, the countries chosen represent those OECD members which hold the largest proportion of DC assets.

Table 1: DC pension assets relative to GDP (2010)

	Pension Assets /GDP	DC Assets /Pension Assets	DC Assets /GDP
Netherlands (p)	134.9%		
Iceland	123.9%	9.9%	12.3%
Australia	90.9%	89.4%	81.3%
United Kingdom (1)	86.6%		
Finland	82.1%	0.0%	0.0%
United States	72.6%	39.0%	28.3%
Chile	67.0%	100.0%	67.0%
Canada	60.9%	3.0%	1.8%
Denmark	49.7%	94.1%	46.8%
Ireland (2)	49.0%		
Israel	48.9%	22.3%	10.9%
Japan (3)	25.2%		
Poland	15.8%	100.0%	15.8%
Hungary	14.6%	100.0%	14.6%
New Zealand	13.8%	73.0%	10.1%
Mexico	12.6%	84.1%	10.6%
Portugal	11.4%	6.4%	0.7%
Spain	7.9%		
Norway	7.8%	0.0%	0.0%
Slovak Republic	7.4%	100.0%	7.4%
Estonia (4)	7.4%		
Czech Republic	6.3%	100.0%	6.3%
Austria	5.3%		
Germany	5.2%	0.0%	0.0%

Note: 1. OECD estimate. 2. Source: IAPF Pension Investment Survey 2010. 3. Source: Bank of Japan. 4. Data refer to investment companies managed funds.

Source: OECD Global Pension Statistics 2011; restricted to countries where pension assets exceed 5% of GDP.

## 2.1 Chile

Chile is an interesting example as it is the country whose pension provision relies most heavily on an occupational DC scheme. The description of DC in Chile is drawn from Kritzer (2008) and reflects the position as

at that time. The DC scheme largely replaces the state provided PAYG system that preceded it. The scheme is largely a private scheme in the sense that workers are required to contribute 10% of their earnings to a scheme, while employers are not required to contribute. The pension scheme is not operated or set up by the employer but rather by a pension fund management company (AFP) of which there were five. On top of this workers pay a management fee to the AFP they have chosen to manage their money and a premium for survivor and disability insurance. AFPs are private companies, who are responsible for crediting the contributions to individual accounts, for investing the proceeds and for buying the individual insurance.

The AFPs are required to offer a range of four or five different funds to members, which are rated A-E and differ in their permitted exposure to equities and other assets, and also in the minimum and maximum rates of return that they guarantee; these rates are related to the average performance of all the other AFPs over a three year period. The AFPs are required to hold reserves to meet the minimum return guarantee. If they fail, the Government makes up the difference. The Government also guarantees a certain minimum pension to those who have contributed for twenty years and whose income from their pension and other sources falls below a certain level.

At retirement age, workers can use their accumulated balances to buy an annuity or to make programmed withdrawals from their individual accounts.

Reforms in the last few years have been aimed at improving pension coverage (making provision for those on lowest incomes through the first pillar, improving the pension level of those who have contributed to individual accounts regularly but still have inadequate pensions), and increasing competition between the AFPs to reduce fees.

## 2.2 New Zealand

New Zealand introduced its KiwiSaver scheme in 2007. It is voluntary, but employees are auto-enrolled, with the right to opt out. Members can choose their own level of contribution from 2%, 4% or 8% of gross pay. If the employee contributes, the employer must also contribute 2%, and the Government also makes a contribution, NZ\$1000 (€630) initially and up to NZ\$521/year (€330/year) thereafter. The individual is free to



choose where the contribution will be directed; currently there are 33 authorised providers, each offering a range of funds. In the absence of a decision on provider and fund, the default is to a conservative fund offered by one of six providers whose investment strategy and fee level are monitored by the Financial Markets Authority. At normal retirement age the money can be withdrawn entirely and used without restriction. Prior to retirement, money can be withdrawn to pay for a first house, in the event of emigration or in case of significant financial hardship.

### 2.3 The Anglo-Saxons (Australia, US, UK and Ireland)

The four countries are grouped together because they share many features. In particular, their common law tradition, their familiarity with financial markets, and their position at the Beveridgean end of the social policy spectrum (with benefits tending to be flat rate, rather than earnings-linked as in the Bismarckian model – see Esping-Andersen 1990) means that there are strong similarities in their approach to pensions.

The following account draws heavily on Ashcroft (2009). Historically, in all four countries occupational pension provision were developed voluntarily by employers, who set up trust-based plans that were typically single or multi-employer where the employers and members nominated the trustees. The plans were predominantly of the Defined Benefit type but DC has become progressively predominant with the process being most advanced in Australia and the US. In the US, employee contributions to standard pension plans are not tax-deductible; hence most of the growth in DC pensions has occurred in so called 401k pension plans where both employer and employee contributions are tax deductible.

In Australia, Ireland and the UK employers are required to make a pension plan available to employees; in Australia the employer is required to contribute 9% of the employee's eligible earnings to the scheme, while in the UK there will be a requirement for the employer to contribute at least 3% of eligible earnings if the employee is also contributing, though currently there is no requirement on the employer to contribute. In the US there is no requirement on the employer to offer a plan or to contribute to one.

Contribution levels are otherwise determined by the plan. There are many different models: in some the contribution of employer and employee is fixed; in others the member can choose the contribution

level, and the employer’s contribution may match it according to some formula. Ashcroft (2009) reports typical figures for contributions to various forms of DC pension in the four countries.

**Table 2: Average contribution levels to DC pensions (%)**

	Employer		Member		Total (most common)
	Contributions	Contributing	Contributions	Contributing	
Australia	14	100	3	Assumes 100	17
Ireland (trust)	6	100	5	Most	11
Ireland (contract) median member	7 PRSA only	10 (PRSA) 0 (RAC)	7	100	7
UK (trust)	6–8	100	4–5	87	10–13
UK (contract)	5–7	65 (stakeholder) 95 (GPP)	3	100	8–10
USA (profit sharing)	9	100	0		9
USA (combination)	5	100	5–7		10–12
USA (401k)	3	95		100	8–10

Note: Total contributions show aggregate average contributions for plans where the majority of both employers and members contribute, or the employer/member contribution level only where only a minority of plans have contributions from both.

In all four countries members are given a choice of funds in which to invest. In all four countries, there is a specific design of DC product which an employer can safely offer as a default when it is required to offer a plan to its employees, but where it need take no fiduciary responsibility. It is worth noting that the design of the default fund is critical; Ashcroft (2009) reports that over 80% of members of DC plans in Australia and the UK use the default fund. The number of funds offered in occupational DC plans varies widely with the median varying between 5 and 17 between the four countries, but with a sizeable proportion of plans offering 20 funds or more. There are few specific restrictions on

the investment strategies of DC funds beyond the “prudent person” principle. All four countries restrict self-investment in the sponsoring employer. Two of the countries explicitly restrict investment in securities not traded on a regulated market and also in derivative securities but, as noted by Ashcroft (2009) the specific restrictions are loosely worded and leave room for discretion. The main governance requirements that protect members’ interests concern the fitness of trustees, conflicts of interest, taking investment advice from qualified professionals, and having appropriate controls and strategies.

The decumulation phase is governed by tax and regulation. Withdrawal of funds is generally discouraged by tax penalties or precluded, with funds having to be kept in the plan until the plan retirement date or transferred to another plan. Uniquely, in the US members may in many cases borrow against their DC assets. In the US and Australia the money in the plan can be withdrawn as a cash sum or reinvested in a retirement plan of some sort or used to buy an annuity. In Ireland and the UK a proportion can be taken as a tax free lump sum. In Ireland the balance has to be used to buy an annuity; in the UK there are restrictions on the rate of drawdown when the amount in the plan falls below a certain level.

## 2.4 Denmark

Denmark has a significant occupational DC pillar. There is a mandatory scheme, known as ATP, with coverage of 87% of the population aged 16 to 65 (OECD). Contributions for full time employees are flat rate and currently 3240 DKK (440€) per year, paid two thirds by the employer and one third by the employee. The contributions are paid into a single fund operated by a statutory body (ATP) which invests in a wide variety of financial assets. The pension is paid out as an annuity computed on the basis of the contributions made and the performance of the fund. It runs what is effectively a “with profits” arrangement, where the fund maintains reserves to meet its obligations, and when there is sufficient surplus declares a bonus. Individual choice is limited to the ability to defer retirement.

In addition, most workers are covered by supplementary occupational schemes which covered 76% of the working population (2006: OECD). While they are technically voluntary, they are in practice made mandatory by collective bargaining agreements. The form largely follows

that of ATP, with contributions being one third from the employee and two thirds from the employer. Contributions are proportional, with the overall rate being 9% for blue-collar workers and 15% for white-collar workers. For those in the public sector, the rate is 12%, entirely paid by the employer.

## 2.5 Hungary

Hungary is an interesting example of political fragility of ownership of pension assets. "Hungary is Eastern Europe's pension reform trailblazer. In 1998, it was the first country to introduce a mandatory second pillar with individual accounts" (Allianz Global Investors 2007). 8% of wages, which had been used to finance the state run PAYG, was diverted into a private sector run defined contribution scheme. Employers, who make no contribution to the DC scheme but continue to contribute heavily to the first pillar, pay the money to the Mandatory Private Pension Funds (MPPFs). Although the final decision making body of each fund is the meeting of its members, in practice the MPPFs are heavily influenced by the institutions that set them up (financial institutions, employer groups and others) (Palmer, 2007). At retirement, members are required to convert their funds into single life indexed annuities (OECD 2011). In 2010, in the face of the financial crisis, the Government first decided to stop transfers of contributions to the private pension funds, and then decided in effect to close down the second pillar by saying that those who stayed in it would lose all rights to their state pension. All but 2% of members then decided to switch out of the private system (Simonovits, 2010).

## 3 Contributions

There are a number of issues concerning the contributions into DC plans: the overall level of the contribution, the default, the degree of choice for the employee in the contribution level, and the split between employer and employee contributions.

### 3.1 Contribution levels

Policy makers like to think in terms of the relation between a pension contribution level, measured as a proportion of earnings, and a pension replacement rate which is an inflation linked annuity as a fraction of terminal wages. It is important to understand that this relationship is inherently highly uncertain in any system, but the uncertainty is particularly apparent in a DC scheme. Even if one abstracts from reality by basing the calculation on a typical pattern of working, wage progression and retirement age, there are major uncertainties including notably

- Longevity post retirement
- Real growth in wages
- Real return on pension fund investment.

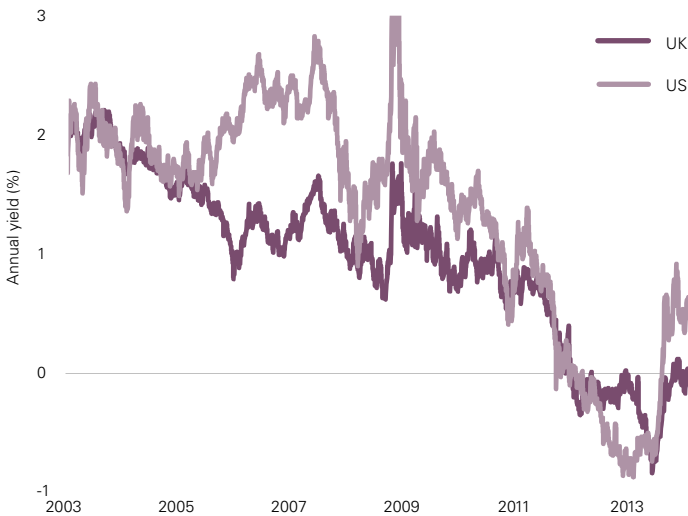
Some rough calculations show the magnitude of these different factors. If one had assumed 20 years in retirement, but life expectancy increases by 2 years, then the replacement rate for any given level of contributions would fall by roughly 10%.<sup>2</sup> Real growth in wages makes some difference in that the faster real wages grow, the harder it is to match a given replacement rate. In effect, a 1% annual increase in real wages has the same effect on replacement rates as a fall of 1%/year in the rate of return on the fund during the accumulation phase.

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2 This ignores the real return on investment assets.

But the factor that has the biggest impact on replacement rates is the uncertainty in the real rate of return on investment. This is not just a function of equity risk. Someone who is highly risk averse would probably invest in indexed Government bonds. Assume for simplicity that long-dated inflation-indexed Government bonds are free from the risk of default, and also that the index used does reflect accurately the inflation experience of the pensioner. The worker would not know from the outset what the yield on the bonds that will be bought with the pension contributions will be. As shown in Figure 1 real long term yields have come down by well over 2% over the last decade. A 2% fall in annual investment returns on a fund that is likely to be invested on average for around 30 years<sup>3</sup> would reduce the replacement rate by almost 50%.

**Figure 1: Real yields on long-dated indexed government bonds (2003–2013)**



Note: UK is yield on 4 1/8% index-linked Treasury stock 2030 (DMO), US is 10yr TIPS real yield (US Treasury)

The volatility of the replacement rate highlights the risks of a DC pension scheme, but may somewhat exaggerate them. The replacement rate is not something that is revealed to the worker as a surprise at the

<sup>3</sup> The thirty years assumes an accumulation period of 40 years and a decumulation period of 20 years.

point of retirement. The performance of the fund can be observed at all times; if the likely replacement rate seems to be too high or too low, the worker can modify their contributions, delay or bring forward the date of retirement.

### 3.2 The default

Under the influence of the insights of behavioural economics as popularised for example in Sunstein and Thaler, 2008, there has been considerable interest in the design of the default. Where participation in a DC scheme is optional, normal practice was that a new employee would be offered membership of a scheme, but in the absence of a positive decision the employee would not be enrolled. By changing the default from non-participation to participation, outcomes changed dramatically. Evidence, largely from the US (Nessmith, Utkus and Young, 2007) shows that auto-enrolment, where employees are enrolled and have to take a positive decision not to join, increases enrolment rates by up to 40 percentage points.

If employees are auto-enrolled, the question then arises as to what they are auto-enrolled in: what is the default contribution rate, and how is their money invested if they do not take any positive decisions. We will look at the default investment in section 4.3. If the default contribution rate is set too high then the fear is that many employees will decide to opt out altogether rather than contribute at a lower rate. However if the contribution rate is set low, then it may create a norm which will encourage a savings rate that may lead to unacceptably low pensions.

What constitutes a high or low contribution rate and an acceptable or unacceptable level of pension will vary from person to person and from country to country, depending for example on whether the DC pension is the main source of income in old age (taking account of the provision of health, housing and social care), on the possibility and acceptability of working longer, and on the desired living standard in retirement.

If the design of the default contribution is as important as it appears to be, then it should go beyond setting a single rate of contribution, but should also include a profile of contributions. It does not seem very sensible to fix contributions as a percentage of earnings. It makes more sense from an economic perspective to see savings as a residual, rising after a pay increase or following a temporary increase in wages

(eg from bonuses or overtime) or when outgoings decline, and falling during a period of declining wages, or increased costs (eg after the birth of a child). Benartzi and Thaler (2004) argue that people who are saving too little because of bounded rationality and limited self-control benefit from a plan where they commit to allocate a high proportion of future pay increases to their pension contributions, with the great majority of people offered such a programme opting in to it, and staying in it. The US Pension Protection Act of 2006 gives safe harbour protection to DC pension schemes with automatic enrolment and sanctioned increases in default contribution rates (Munnell *et al* 2009).

One could take the logic of the default – the fallibility of individual decision-making, the confusion induced by excessive choice – and argue that the contribution rate should be hard-wired into the DC scheme. This would have the added advantage of simplifying administration and reducing costs. But the disadvantages of not offering members a choice of the default or non-participation are large. Members' circumstances vary widely. In many countries existing pension rights will vary across the population very widely depending on their prior employment patterns (employed with a traditional DB pension, employed with an active DC plan, no significant pension savings, unemployed, or self-employed) and the pension position of partners. Their ability to save will also vary. People who want to save more than provided for by the default could save outside the plan, but having a multiplicity of plans is likely to increase costs and reduce the quality of decision making. There are powerful grounds for allowing members to make additional contributions over and above the default level.

### 3.3 Employer/employee split

In a compulsory DC scheme, where employees are required to enrol and required to contribute at a certain level, the issue of how the contribution is split between employee and employer appears to of limited economic significance. In a competitive labour market, changes in the split are likely to be offset by changes in the wage level. The main benefits of requiring the employer to contribute are that it makes it easier to justify compelling the employee to contribute,<sup>4</sup> and it makes a political

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<sup>4</sup> For some workers, who may get means tested benefits in retirement, the return on pension savings may be low. It may be easier to justify compulsory contributions if part of the contribution is coming from the employer and not directly from the employee.



statement that the employer is sharing responsibility with the employee for living standards in retirement.

Where participation in the pension scheme is voluntary and the employer contributes, the employer contribution is generally contingent on a matching employee contribution. The form of match varies widely: the employer may commit to making a contribution that is a fixed proportion or multiple of the employee's contribution, up to a certain level, or may contribute a fixed proportion of wages provided that the employee pays a certain proportion.

From the perspective of the employer, the justification for contributing to the employee's pension is quite weak. As we have seen in section 1.3, the employer may wish to attract those workers who put a high value on pensions, and also may have an interest in ensuring that workers have sufficient savings as they age to enable them to retire in comfort, but in general paying workers in kind is expensive. Many workers will put less value on one euro in their pension pot than in their pay packet, and those who value pension savings highly can take the extra wages and contribute them to their pension.

The experience in the US in 401(k)s is interesting: the employer contribution rates are not constant over time and appear to adjust to market conditions. The PSCA annual survey (PSCA 2011a) shows that the average employer match was equal to 2.3% of pay; over the period 2008/2011, two thirds have maintained the employer rate while the others have varied it, with a slight preponderance of employers increasing the match (PSCA 2011b).

## 4 Investment

In this section, we look at policy on the asset mix in DC pension funds. The first part looks at the issue from a normative perspective: how should individual DC pension pots be invested? What are the factors that are important and how do they vary across individuals? This discussion provides essential background to the second section that addresses the design of the default option. In any compulsory scheme there is bound to be a default investment option; but even in voluntary schemes, there is almost always some recommended or default strategy for those people who do not have strong views of their own. The third part considers the amount of choice that should be offered to DC members and the fourth part looks at the role of regulation in constraining the range of choices offered to investors.

### 4.1 Optimal investment

The finance literature has paid considerable attention to the question of optimal investment strategy. While many of the details, which are critical for detailed implementation, are controversial, the following analysis, based on Campbell and Viceira (2002), encapsulates many of the insights of the classical approach.

It starts by characterising the objectives of the investor; the investor is assumed to be rational in the sense that she is seeking to maximise some expected utility function defined over future consumption. This seemingly technical observation has a number of immediate and striking corollaries:

- It implies that the riskless asset – the asset that someone who is totally averse to risk would want to hold – is not a money market account, but is a risk free bond with the similar duration to the investor's consumption. Of course there may not be any available assets

that approximate such a long duration bond, but it is the yardstick that defines risk. Changes in the cash value of the portfolio give a misleading impression of the real risk of a portfolio, understating the risk from holding cash and short duration bonds, and exaggerating the risk of long-dated and specifically inflation protected bonds.

- The object that should be managed is not the DC pension pot in isolation but the entire wealth of the individual. This includes other financial wealth, other pension assets, the present value of future labour income, and claims on welfare and other benefits. It is unlikely that the optimal strategy for someone who has no other source of income in retirement than a DC pension is the same as for someone else who can expect a steady stream of income for the rest of their lives from other pensions or from welfare benefits. The latter investor might be expected to hold far less in the way of bond-like investments in their DC pension plan because of the substantial holding of such assets outside the pension plan.
- So long as the ratio of reward to risk remains stable (and we will look at this question in more detail below), the proportion of the investor's total wealth that is invested in risky assets should not change with age. We will see below some reasons for modifying this conclusion, but it is hard to find within the classical paradigm any logic for the common practice of shifting DC assets out of equities into cash or bonds as retirement approaches. Nor is there any justification for someone who is prepared to take risk to gain additional return to shift all their wealth into low risk assets after retirement. Indeed, as Gomes *et al* (2008) argue, with many people in retirement holding a substantial part of their wealth in the form of low risk claims on pensions and welfare benefits, the proportion of their financial wealth that should be invested in risky assets should be commensurately higher.

To get more concrete results, we then need to make some simplifying assumptions; these can subsequently be relaxed, and the conclusions re-evaluated. We assume that the individual knows exactly how much she will save during her working life, and how long she will live in retirement. The savings will be invested in a fund and the money will be drawn down in retirement to fund her post-retirement expenditure. She has no other assets or sources of income in retirement. She can invest her money in a range of financial assets – including a risk-free asset – whose return characteristics are known, and which are constant over time.

Mean-variance theory<sup>5</sup> shows that the optimal investment strategy is to hold some combination of the risk free asset, and an efficient portfolio of risky assets; the efficient portfolio offers the maximum possible expected return over the risk free rate of interest per unit of risk. All investors should hold the same efficient portfolio, but those who are more risk averse should put less of their wealth into that portfolio and instead hold more of the risk free bonds. The portfolio composition of an individual investor should remain constant both during the investor's working life and in retirement.

There is an obvious problem in applying this prescription directly to investing a pension portfolio. Suppose the theoretical optimal strategy for this investor is to put half her wealth into the risky asset. Early in the person's working life, most of her wealth is in the form of human capital. Assuming she is not able or willing to borrow, she will be unable to invest half her total wealth in the risky asset. With the borrowing constraint, the optimal strategy is to invest all her pension fund into the risky asset until such time as it amounts to half her total wealth. As she ages and more of her human capital becomes financial capital, the borrowing constraint ceases to apply. She will have reached the target holding of risk assets and invest what had been (by assumption) risk free human capital into risk free bonds.

So the prescription is to follow a form of life-styling but not in the form that it is normally practiced in the market. The theory suggests that initially the fund should be fully invested in risky assets until a target value (expressed as a proportion of the investor's entire wealth) is attained. After that point is reached, incremental savings ought to be devoted to risk free assets. The proportion of the fund that is invested in risky assets will decline, but not because the portfolio should switch out of risky financial assets into riskless financial assets, but because the individual is switching out of riskless human capital into riskless financial assets.

There are many ways of relaxing the model and these will modify the conclusions. We have assumed that human capital is risk free. In fact there is risk and future labour income may well be correlated with the equity market (Benzoni *et al*, 2007). This correlation will reduce the amount of risky assets that people should hold in their portfolios when

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5 Mean-variance analysis should be regarded as a generic approximation to a utility function; modelling agents with specific utility functions complicates the analysis without generating significant insights for the sort of problems we are interested in.

they are younger (though the desired amount may still be more than the financial assets they actually have in their portfolios) but it would mean that once the borrowing constraint is no longer binding, a proportion of further saving should go into risky assets – swapping risky human capital for risky financial capital. A further implication is that in retirement, when many people have substantial wealth outside their pension pots in the form of state pensions or welfare benefits which is low risk, the proportion of their pension fund that is invested in risky assets should be higher to keep their overall risk exposure in line with target.

Another key assumption that needs to be examined is the assumption that the investment opportunity set is constant. There is substantial evidence that equity returns are predictable (for example Lettau and Ludvigson, 2001), with equity prices deviating from but subsequently returning to fair value. This suggests that equity is more risky as an asset in the short term than it is in the longer term. The implication of this is that equity should have a larger role in long maturity portfolios than in short maturity portfolios, and that pension funds should shift some of their assets out of equities into bonds as the investor's horizon shortens.

But the significance of this argument should not be exaggerated:

- The increase in risk as the horizon shortens does not eliminate the reward per unit of risk but only reduces it, and roughly speaking the holding of risky assets should be proportional to the reward/risk ratio;
- The investor's horizon at retirement is still quite long – typically 10–20 years – so the effect on the composition of the portfolio at retirement may be quite small;
- As Viceira (2007) points out, if there is mean reversion, then the expected return on equity varies – being high when equity is under-valued and low when it is over-valued. The logical implication of this is that the optimal investment strategy should also be time varying, with exposure to equities increasing after a market decline and reducing after a rise. It would be inconsistent to argue for reducing equity exposures with investor age on the grounds of equity risk being greater at short horizons without at the same time following a market timing strategy of increasing equity share as the market declines and reducing equity share as the market rises;
- The evidence for mean reversion is far from universally accepted (Goyal and Welch, 2008).

In terms of detailed portfolio composition, and the balance between asset classes, finance theory is clear in principle: the holding of an asset should depend on its expected return (over and above that of the risk free asset) and its incremental contribution to the risk of the portfolio. This implies that the hurdle for inclusion is much lower for assets whose risks are not highly correlated with the risks of the rest of the portfolio than it is for investing in similar assets to those already represented. It therefore seems plausible that the equity component should include a substantial proportion of foreign equities, and the proportion should be higher when the domestic market is small and concentrated.

There has been much work on the merits of active versus passive management, much of it in the context of stock-picking in equity portfolios. From the perspective of DC pension funds, the issue is not so much one of whether or not there are managers who can out-perform the market, as whether there is any reason to believe that those picking the managers of DC assets would be able to identify the managers who can out-perform. This seems so improbable that some kind of index tracking strategy, which benefits from low transaction costs, is indicated.

However, it does not follow from this that totally passive investment is desirable or even possible. The investor has to make a decision on how to allocate their wealth between asset classes. That will reflect judgements about expected returns and correlations over different horizons. Those judgements are likely to change over time.

So far, I have discussed the qualitative implications of finance theory for the investment of pension assets. The quantitative implications are far less easy to pin down. The desirable exposure to equities for example depends on the equity risk premium. Yet opinions about the size of the equity risk premium are notoriously variable; Fernandez (2010) documents a range of estimates of the expected equity premium in corporate finance textbooks of between 3.5% and 7.5%/year.<sup>6</sup> With poor equity returns over the last decade, average estimates of the size of the equity risk premium have come down by more than 1% – though it is not clear whether this is simply the result of rational updating in the light of new information, or the habit of putting excessive weights on more recent data. With the theoretically optimal level of exposure to equities being proportional to the premium, differences in views about

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6 The premium depends to some extent on definitions; the definition I am using here is the expected geometric excess return of stocks over Treasury Bonds.

the premium and how it changes over time have large impacts on the identification of the optimal investment strategy.

These remarks apply equally strongly to the identification of the optimal mix of risky assets. As already noted, applying the theory requires predictions of the risk premia on different assets, their riskiness and their correlations.

This is not to argue that because there is a wide range of views about the inputs to a portfolio optimisation model that they are therefore all equally valid, but rather to make the point that expert and well-informed views on what constitutes an appropriate and sensible investment policy for a typical DC portfolio are likely to vary widely, and also to vary over time.

However, using the insights of modern finance theory and the framework of a classical expected utility maximising investor, there are some conclusions one can draw about the characteristics of an optimal investment strategy. It is notable that these characteristics do conflict to some extent with what is actually done in practice.

- The pension investment strategy should be considered in conjunction with the saving strategy, decisions about working and retirement and the presence of other assets and wealth, whether in financial form or not. It is unlikely that the optimal strategy for someone who has no other source of income in retirement than his DC pension is the same as for someone who can expect a steady stream of income for the rest of their lives from other pensions or from welfare benefits. The latter investor might be expected to hold far less in the way of bond-like investments in his DC pension plan since he already holds them outside his pension plan.
- Utility maximising investors see a trade-off between risk and return. There is no reason to believe that this does not hold true for poor people or people who have reached the age of retirement.
- While the classical finance paradigm does support the idea of life-styling, in the sense that the optimal asset mix should become less risky as the worker approaches retirement, there is no support for moving wholly or mainly into either cash or bonds. The form of life-styling that is supported is investing largely or wholly in equities early in the working life, and subsequently channelling later contributions predominantly into lower risk but still long duration assets such as bonds.

## 4.2 Guarantees and risk sharing

In a pure DC scheme where people are free to choose the asset mix for their own fund, individuals can make their own trade-off between risk and return. The range of possible outcomes for an individual, and the dispersion of outcomes between individuals will be large as a very simple calculation makes clear. Take a very simple model where a worker pays 10% of his wages into the pension fund, where there is a risk free asset which earns a certain real return equal to the rate of increase in wages,<sup>7</sup> where the worker works for 40 years and lives in retirement for 20 years. The pension pot will provide a certain replacement rate of 20% of final earnings, with the pension escalating with earnings. Now suppose that equities earn a premium of 4% over the risk free rate and have a volatility of 20%, and these remain constant over time. If the worker invests fully in equities until retirement and then buys an annuity, his median replacement rate is 44%, but this is subject to considerable uncertainty. There is a 5% probability that the rate could be lower than 10% and the same probability that it could be higher than 194%.<sup>8</sup> Replacement rates would vary widely between cohorts and, within cohorts they would also vary between people depending on their choice of asset allocation strategy, their precise contribution profile and their choice of fund. If two funds are broadly similar, with one doing better than the other some years, and the order reversed in other years, and if they typically differ in performance by 3% each year, then over a 20 year investment horizon, chance will ensure that the cumulative difference in performance might well amount to 15%.

Faced with this degree of risk, there has naturally been considerable interest in ways of mitigating it. In this section I explore two types of alternative: an external guarantee, where the manager of the fund guarantees a minimum return on investment, and a collective DC arrangement.

In the former category, consider for example the Riester pension where the provider of the fund has to guarantee at least the return of contributions (including those from the state). The argument in favour of guarantees is that they can reduce the risk of the fund, but of course they also reduce the expected return on the fund. There seems to be

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7 This analysis abstracts from the uncertainty in real interest rates which, as already discussed in section 3.1, further adds to the difficulty of predicting replacement rates.

8 The analysis assumes the money is on average invested for 20 years, and that returns are lognormally distributed where the mean of the log return is 4%, and the annualised volatility is 20%.



no good reason for believing that it can reduce the risk more effectively than the obvious alternative: shifting the fund into lower risk assets. In fact, the ultimate provider of a guarantee (the provider of the fund, or some financial intermediary from whom he in turn buys the guarantee) is likely to hedge themselves precisely by switching into riskless assets and selling out of risky assets as the fund value declines.

So the argument against guarantees is that they do nothing more than the investor can do by themselves, but they bring with them added disadvantages, notably opacity and illiquidity. The opacity arises because it is much more difficult to compare two funds which have guarantees than those without. The terms of the guarantee may be different in the two cases, and even where the two guarantees are couched in similar terms, the value of a guarantee in a fund that takes more risk is higher than the value of a guarantee from a lower risk fund. In the extreme, the value of a guarantee from a mixed equity/bond fund that shifts into bonds as the stock market declines is worth very little since the strategy itself makes the chance of a fall in value remote, while for a fund that keeps a constant exposure to equities, the guarantee may be valuable.

The illiquidity problem arises because the guarantee is valuable but hard to transfer if you want to transfer your money to another provider or if you want to change the riskiness of the portfolio. This is unlike a simple asset management contract (as in a typical OIEC structure) where you can choose to take your money away from one manager and give it to another with low switching costs.

The other approach to guaranteeing returns is the collective DC approach which is typified by the Danish ATP scheme. As noted above, contributions are invested in a single fund. The pension level is guaranteed and the level is increased in line with the performance of the fund. It is important to distinguish two different ways in which collective DC helps deal with risk. The first is essentially cosmetic. It focuses members' attention on contributions and benefits rather than on the current value of assets. In principle, one could replicate this in an individual DC plan. On the basis of current assets in place, the investment strategy, contribution levels and possible investment returns, one could compute the level of pension the member could confidently expect to receive at retirement. Then as uncertainty diminishes one would update this floor. In the event that things turned out to be worse than the pessimistic scenario, the member would be expected to increase their contribution rate. This method of reporting would not reduce the risk to which the

member is exposed but might make it easier to live with. And it may in turn make it easier to follow an optimal investment strategy; it is striking for example that in the UK Government Actuary's Department analysis of collective DC (Department of Work and Pensions, 2009), a substantial source of benefit comes from not reducing equity exposure in the years prior to retirement.

But the second way in which collective DC works is by inter-generational transfer: the fund's reserves build up during periods when asset returns are high and are drawn down when asset returns are low. By diversifying risk across generations, the risk-return trade-off for all generations is improved (Gollier, 2008). To get these benefits, it is probably necessary to have some degree of compulsion in the system. The reserves of the collective DC fund will vary between high and low levels. Anyone entering the system when reserves are low knows that the capacity of the system to ensure them against bad outcomes is small, and the scope for them to benefit from good outcomes will be limited by the need to rebuild reserves. So without compulsion, people may find it better to save outside the collective DC scheme when its funds are low, and the scheme will then wither away. It is striking that participation in the Danish scheme is mandatory, and contribution rates are fixed.

The two problem areas identified above in connection with outside guarantees – opacity of charging and lack of liquidity equally apply to collective DC. Of course, to the extent that contributions to the scheme are mandatory, and money cannot generally be withdrawn or reallocated within it, the opacity of charging at the individual level and the inability to value the individual claim precisely are far less important than they would be in an environment where members are free to vary their contributions and switch their portfolios.

There are two other important issues that are raised by collective DC. One is governance and the other is choice. Since the assets are held collectively, there are bound to be conflicts of interest between the different members – between young members and members nearer retirement and those actually in retirement. This is not the case in individual DC where each pot can be managed separately. The rules of the scheme have to be flexible enough to cope with the major changes that occur over generational timescales and that are rarely foreseen – demographic, labour market, financial, costs in retirement. The flexibility means that inevitably decisions will be taken by those running the scheme that will affect members differentially.

Furthermore, since the nature of funded pension schemes is that they invariably face solvency problems long before they face liquidity problems, collective DC schemes in the face of poor outcomes will have a strong temptation to postpone present pain and build up future obligations that cannot be met. This poses huge challenges for governance, challenges that are likely to be met in different ways and with different degrees of success in different countries.

Collective DC also offers little or no choice to members. This may matter for two reasons. First, there is little apparent difference between a mandatory contribution paying for a future entitlement to income, and a public pension funded by a payroll tax. If one of the objectives in moving away from the first pillar and towards DC pensions is the need to reduce taxation, then collective DC does not help. Second, insofar as pension demands differ between people (for reasons we have examined above), collective DC fails to accommodate those differences.

### 4.3 Choice and the default option

Looking across the world, there is wide variation in the investment choices available to members of DC schemes. In New Zealand, under Kiwisaver, the individual could choose between 33 different providers (as at 8/11/2010), each offering a large number of investment options. At the other extreme, the Danish ATP offers no choice of manager or fund.

Standard economic arguments suggest that scheme members should be given maximum choice. People have different preferences and beliefs, they are putting in their own money (albeit sometimes with an employer contribution) and they will bear most of the costs of wrong decisions. They should be protected from fraud and misleading representations, but there is no reason why regulation and protection should be provided over and above what is already in place for other savings products. Competition between providers in this field as in any other should lead to them offering what the consumer really wants, and not what some panel of experts think they want. Furthermore, by regulating the choice, the regulator inevitably takes some responsibility for the outcomes.

The counter-argument is that competition does not seem to deliver good outcomes in this area. Dobronogov and Murtha (2005) report that management fees and charges reduce yields on individual DC pension

funds for a worker with a full contribution record over 40 years in different Latin American and transition economies on average by 0.54–1.36%/year depending on the country. Charges have a substantial effect on outcomes, and by restricting choice it may be possible to reduce management costs. Choice does not seem to be greatly valued; evidence from the US and Sweden<sup>9</sup> show that when given choice, the great majority of participants decline to take it and resort to the default option. Where they do actively choose, the choices do not square well with what standard economic theory would regard as good policy. Munnell *et al* (2009) point to the fact that 11% of 401(k) assets are held in company stock (a bad investment from the perspective of risk diversification), and that 14% of participants hold just money market funds in their plans.

Doing away with choice of asset allocation altogether in an individual DC scheme looks unattractive. As we have seen, there is no single right answer to the asset allocation puzzle even for some representative investor, nor is the right answer likely to be right for everyone. If members have no choice, they will naturally turn to the body that chose the asset allocation if it turns out in the event to perform poorly. Furthermore, if people are forced to invest in ways they do not wish to, they are likely to save less; any contribution from the employer and from the Government will go to offset the impact of the restriction, and have less value as a means of either increasing saving or aiding recruitment and retention.

For these reasons, one might expect DC plans to offer a range of funds to invest in, a range that is broad enough to allow most workers to get close to their optimal portfolio, but narrow enough to retain efficiency. The funds would be chosen to provide efficient ways of getting exposure to specific asset classes. With many people likely to end up in the default fund or mix of funds, the main focus on protecting people from bad asset allocation decisions would be to ensure that the default fund is broadly suitable for most members; members would be free to follow asset allocation strategies that might seem excessively risky or too conservative, but they would have to do so by actively deviating from the default fund.

As we have seen, the optimal investment strategy for an individual depends heavily on both individual specific factors (risk aversion, composition of the rest of their assets, age, retirement expectations, and

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9 Beshears *et al* (2009) for the US, Cronqvist and Thaler (2004) for Sweden.

dependents) and beliefs (about asset returns, risks and correlations). It seems hard to tailor a default fund to much more than the member's age; if one tried to take account of all the other factors one is really going down the path of giving individual advice and that is a route that the member has chosen not to take. In designing the default fund, one then has to have a specific member in mind. Should it be the median member, or is one designing the fund for someone poorer, or more risk averse than the median? If the default strategy is not well-designed for the median member, then many members who do default will be in the wrong funds. On the other hand, if members are put into a default fund that turns out to perform badly, and the under-performance can be attributed in part to the chosen level of risk, they are likely to blame the designers of the default fund.

There is much theoretical and empirical literature (starting with Grinblatt, Titman and Wermers, 1995) showing how the investment decisions of fund managers are influenced by their own financial and career incentives, and how this may conflict with the interests of investors. It seems likely that agents designing and implementing asset allocation strategies for DC pension funds will be affected by the same conflicts.

One conclusion one can draw from this is that the default fund should be just that: a default for those who have decided not to take their own decision. Fund sponsors should not actively encourage members to go for the default fund.

## 5 Decumulation

The word “decumulation” covers the payout phase. The regulation of the payout phase varies widely internationally. The European Federation of Retirement Plans (EFRP, 2011) in its survey of DC plans shows that while in some cases<sup>10</sup> schemes are permitted to make full lump sum payments to plan members, in most cases there are restrictions. At the most restrictive end<sup>11</sup> all pension capital must be converted into a life annuity. In some DC schemes (Finland and Norway) all pension capital must be distributed through a regular income stream, but both temporary annuities and income drawdowns are permitted, with a minimum duration upon the regular income stream.

### 5.1 Restrictions on drawdown

In other schemes, retirees are permitted to take part of the money as a lump sum, and part either as an annuity or with restricted drawdown. The capital that can be taken as a lump sum is generally a fixed proportion of the value of the fund. There is a range of restrictions on the speed of drawdown; in the case of Ireland and the UK, the cap is lifted for those who are assured of a certain minimum income level.

There appear to be two lines of argument supporting restrictions on the use people can make of their pension pots. The first relates to myopia: people in general are not the rational decision makers of economic theory. They need to be protected from their own ignorance and lack of understanding, and from expropriation by a financial services industry that has not always served its clients well. As Barr and Diamond (2009)

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10 Austria, Belgium, Spain, PERCO schemes in France, voluntary occupational pension plans in Poland and mandatory pension funds in Hungary and Romania.

11 Some of the DC schemes in Austria, Article 83 group insurance in France, pension plans in Iceland and the Netherlands and the mandatory funded pillars in Croatia, Denmark, Poland and Sweden

argue “information processing problems arise when the problem is too complex for many agents, even when they are provided with the necessary information. Such problems are more likely where the time horizon is long, the outcome involves complex probabilities, or the details are inherently complex, all of which characterize most pension products. Advice can be expensive and inadequate. For these and other reasons, poor decisions give a justification for compulsion, and the simple assumption of rational utility maximization is not a good basis for pension policy design.”

In particular, there is a case for forcing people to use their pension fund to buy a life annuity – a product that pays a steady stream of income for life. In theory, as Yaari (1965) argued in a classic paper, life annuities allow people to move wealth from states of the world where they cannot consume it (because they are dead) to states where they can consume it, and annuitisation therefore appears in general to be welfare improving. The simplest forms of life annuity are easy to understand; this is important because it means that people can understand what they are buying, and pricing is reasonably transparent, so competition between providers can be expected to be effective in restricting prices. This is borne out by the evidence. There have been a number of studies across different countries of the value of life annuities relative to their price (AMW), where value is the expected value of future payments to a typical annuity purchaser discounted at the risk free rate of interest. McCarthy and Neuberger (2004) summarise the studies and argue that “AMWs in most countries are fairly close to 1. This implies that the margins of insurance companies selling these products are low.”

A second line of argument concerns the protection of public finances. If people consume their pension pots too rapidly they may impose additional demands on means-tested welfare benefits; while this does not require people to annuitise their wealth, it does imply some restrictions on the speed with which people can be allowed to deplete their pension savings.

## 5.2 Annuities

Whether or not the restrictions are in the true interests of the individual, the fact is that people rarely buy annuities voluntarily. In the UK market for example, Cannon and Tonks (2010) show that voluntary annuity premiums have typically been under 10% of the annuity market. If the

restrictions on payout are binding they are bound to be seen as making pension saving less attractive whether they are in the best interests of the individual or not.

But there are a number of reasons why annuitisation may not be in the pensioner's best interests. A fixed nominal annuity does not protect against inflation. Inflation linked annuities may be unavailable or expensive in the absence of a liquid market in index linked securities. There is persuasive evidence, reviewed in McCarthy and Neuberger (2004), that annuity markets are affected by information asymmetry; people do have some information about their own prospective life expectation, and those who know they are likely to die earlier will find annuities expensive.

The standard life annuity is also affected by two fundamental problems: risk exposure and liquidity. One of the abiding principles of finance is the trade off between risk and return; the assumption is that people are prepared to take some risk to gain greater expected returns. There is no reason to suppose that the trade-off stops at retirement. A vanilla annuity is effectively a bond investment; many people will not want to lock up their wealth in a very low risk, low return investment for the twenty or thirty years of life they have remaining. The other problem with annuities is that they are virtually irreversible; faced with a sudden need for cash, it is impossible, or expensive, to cash in the annuity.

There are ways of mitigating the problems of annuities. Insurance companies in different countries offer a variety of products that combine guarantees on lifetime income, with options for cash withdrawal, returns that are linked to investment performance of equities or other asset classes, and with guaranteed death benefits. The problem is that the products tend to be complex and hard to compare. It is not easy to estimate fees and charges on a comparable basis when the fees include not merely management costs, but also reflect the costs of providing guarantees and valuable options to the policy holder. These guarantees and options mean that, even in the absence of specific switching fees, it is costly to change providers when the policyholder thereby loses potentially valuable features of the policy that have already been paid for.

Variable annuities may be a good product for investors who are well-advised, who can fully appreciate the features of the product they are buying, and who are in a position to compare the product with other more flexible means of achieving their objectives. But they will continue



to present problems for clients who are not well-advised and who cannot appreciate fully the costs and restrictions of different products.

Requirements to annuitise have differential impacts across different groups. In general, restrictions on the way pension wealth can be used will impact far more sharply on those for whom the pension assets are a large proportion of their financial assets. Those with substantial financial assets outside their pension pot can offset or mitigate the restrictions. In case of emergency they can draw on their other assets. If they are forced to overinvest in bonds in their pension fund (through buying nominal annuities) they can change the balance of their non-pension portfolio to get more exposure to higher risk/higher return assets.

Another important dimension on which people vary is the degree to which the rest of their total wealth is annuitized. People who are heavily dependent on welfare benefits, people with other sources of pension income, people in households which can assure them of adequate income over the long term already have large part of their wealth annuitized, and for them the benefits of further annuitisation may be very small. And for those people who expect to die with assets that they would like to leave, further annuitization may be sub-optimal.

## 6 Governance

Much has been written about the governance of pension funds in general. DB pension plans in particular are complex entities; there are multiple parties with a stake in the decisions taken by the fund – employers, current employees, deferred members, retired members – and their interests often diverge. By contrast, the governance issues facing a DC plan are much more straightforward. With individual accounts, the plan does not have to prioritise competing claims on a single pool of assets; with individual choice, they do not have to determine the way that the assets are invested. Indeed, it is perfectly possible to design a DC system without any governance at the plan level at all as the example of Chile shows.

The authorities can designate who is permitted to provide DC funds; they can set contribution levels for employees and employers; they can impose requirements on employers on enrolment of employees and on transferring contributions to the funds; they can regulate the provider and specify in whatever detail seems appropriate the choice of funds, the way assets can be invested, the charging structure and the information flow to members.

But in many countries, DC plans will be set up by individual employers or groups of employers, or by labour organisations. They may – very likely will – delegate to commercial providers the various functions, but there will need to be someone – call it the plan sponsor – to choose the parameters of the scheme insofar as they are not laid down by regulation (eligibility for participation, contribution levels, range of investment choices offered, information flow to members, charging structure, choice of investment manager). Whether the plan is managed by the employer or by the members of the plan, the broad objectives of the sponsors are clear – to manage the plan in the best interests of its members, and those interests by and large are reasonably clear. As always when someone acts on behalf of others, there is a need to

avoid conflicting interests. So for example, where the plan sponsor chooses the money managers it would be quite undesirable for the sponsor to have a commercial interest in the manager. Nor would one want to see employers using DC pension plans to fund or support their own companies. But these kinds of concern are not unfamiliar in other contexts of agency, and mechanisms to prevent or control conflicts are well-established.

However, the choice of the default mechanism, and the design of the default fund do raise issues that are specific to DC pension funds and merit further discussion. We have already seen the importance of the default in DC schemes. The reason why it poses governance issues is that in choosing the default fund, the sponsor is bound to think not only about what is optimal for the members, but also about its own position. Performance will not be judged *ex ante*: was the asset allocation likely to maximise the welfare of members given the information available at the time? but rather *ex post*: did the strategy that was followed perform as well as other plausible candidates? The issue will be particularly acute if the employer is also a sponsor because they could be deemed – depending on the regulatory and legal environment at the time – to be at least partially responsible for any under-performance, and might be required to compensate members.<sup>12</sup>

It is hard to be sure what biases the fear of *ex post* criticism will create. But it seems plausible to believe that sponsors will be more severely criticised for taking excessive risk when returns for risk taking turn out to be low or negative than they would be for taking insufficient risk when the returns for risk turn out to be high. It is also plausible that they will be criticised if the value of the fund falls in nominal terms whether or not it falls in real terms (that is in terms of the fund's ability to purchase a real stream of income over twenty or thirty years). Finally, whether rational or not, the sponsor may well face much more severe criticism for value volatility by a member who is close to retirement than one who has many years to go. The fear then is that the default fund will be too heavily biased to low risk assets, and in particular to cash whose risk characteristics make it poorly suited for a pension savings plan.

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12 It is worth recalling the history of DB pension plans both in the US and the UK (Hannah, 1986); pension obligations were obligations of separately constituted trusts that had very limited recourse to the employer. Subsequent legislation has greatly extended the ability of scheme members to have recourse to the employer's assets.

In practice, the governance problem may not be too severe. Plan sponsors have no direct interest in the design of the default fund that puts them into conflict with the interest of their members. In the face of conflicting views about optimal default portfolio design, and their fear of being blamed for decisions that turn out badly, plan sponsors are likely to follow the consensus on the grounds that they if they get things wrong, they are far less likely to be criticised if they were doing the same as other funds. Governments and other national and international bodies have a useful role to play in issuing guidelines.

## 7 Application to the UK

### 7.1 Auto-enrolment and NEST

DC pensions are particularly topical in the UK. The UK's pension system is unusual relative to its OECD peers in having a relatively small first pillar (state pension), with only a limited earnings related component that is due to be phased out entirely. Pension adequacy in the UK has therefore rested heavily on the second pillar (occupational pensions, covering both public and private sector employees) that has historically been overwhelmingly defined benefit. At least for those covered, which approached half the working population at the peak, occupational pension schemes offer a level of income replacement in retirement that is comparable with many other OECD countries.

But DB schemes have been in long-term secular decline, particularly in the private sector. The Occupational Pension Scheme Survey suggests that in 2012 there were just half a million active members of private sector DB schemes that were still open to new members, a tenth of the number 20 years earlier. The decline in DB has been only partially offset by an increase in DC. While the proportion of employees in DB pension schemes declined from 46% in 1997 to 28% in 2012, the proportion in DC schemes rose from 10% to 17% over the same period (Office for National Statistics, 2013).

The Pension Commission, a body set up by the Government under the chairmanship of Adair Turner, published its final report in 2006. It highlighted the inadequacy of overall pension provision in the UK, and made recommendations for the simplification of the state pension system and the establishment of a mandatory private pension system. It led to the imposition of a requirement on employers under the 2008 Pensions Act to auto-enrol employees in a qualifying pension scheme. In practice, this has meant a requirement on employers to offer as a minimum a DC scheme to which employees contribute 4% and employees contribute

3% of their earnings; employees are automatically enrolled, but can choose to opt out. The level of contribution was expected to generate an earnings related pension equal to around 15% of average earnings at retirement; together with a state pension equal to 30% of average earnings, this would imply a replacement rate of around 45% for the median earner. The UK Government has also established a quango called NEST (National Employment Savings Trust) to run a low cost DC pension scheme, and is also consulting on measures to restrict management fees on DC schemes more generally.

The design of the auto-enrolment scheme reflects much of the research referred to earlier in this paper. The DC model used is a pure DC scheme, with individual accounts that have a well-defined market value at any time. There is no insurance element or guarantee. The use of auto-enrolment, rather than compulsion at one extreme or pure voluntarism at the other, harnesses inertia to overcome myopia. The presence of a significant employer contribution means that the expected net return on employee contributions should make investment in the pension attractive to almost all employees, and so obviates need for personalised advice. NEST in particular directs employees quite strongly into default funds, though other choices are available.

The design of the default funds in NEST appears to reflect some of the agency problems in delegating investment strategy to an agent. The strategy makes heavy use of life-styling; in the last 5–10 years before retirement the individual fund is shifted into lower risk assets, including bonds and cash. For savers in their twenties, the fund is also invested in lower risk assets; the argument is that poor returns in the earliest years discourage saving. As argued in section 4, this contrasts with a rational investment strategy which is to invest the fund entirely in risky assets initially, and to integrate the management of the accumulation and decumulation phases. Arguably, life-styling is more about protecting the fund manager from particular forms of criticism (fund value being less than accumulated contributions, a danger that is much greater in the early years; final value of fund at maturity being below its maximum) than about meeting the real needs of beneficiaries.

## 7.2 The defined ambition debate

The UK Government has been encouraging a debate on what it has called “Defined Ambition” (DA) schemes that are a compromise be-

tween DB and DC. The debate is premised on the assumption that a critical difference between DB and DC is “who bears the risk regarding the level of savings and/or income in retirement” (Department for Work and Pensions, 2013, page 9). The argument is that under DB the employee gets certainty, but the employer faces heavy and uncertain costs, while under DC the employee takes all the risk, but the employer’s costs are well defined from the outset. The search for DA is the search for a happy compromise where risk is shared and costs are controlled. DA ranges from modifying DB by removing some of the requirements on the employer in terms of inflation proofing and protecting early leavers, to enhancing DC with guarantees and targets.

To some extent, the debate is based on a misunderstanding. If the problem with DC is lack of certainty for the employee, it would not be very difficult to overcome it. There is a substantial market in Government issued long dated indexed linked bonds. If people with a DC plan want to avoid risk, they could invest in indexed gilts. No strategy is devoid of risk (longevity risk for example would remain) but such a DC plan would almost certainly be less risky than a standard DB pension which is subject to final salary risk, scheme closure risk and scheme failure risk. The reason why the strategy is not a serious runner is that few people are interested in such a low risk, low expected return strategy.

The right way to frame the debate is this: in DB, the employer takes on most of the risks of pension provision (and typically, though not necessarily, keeps the risk by deliberately mismatching assets and liabilities in its pension scheme). In DC, the employee can choose how much risk to keep and how much to pass on to the capital markets. DA makes sense if it provides a cheaper or more effective way of getting rid of risk than through the capital markets. But it is unclear how, using collective action by employees, or through the involvement of the employer, this can be achieved. In section 4.2, the possible gains from inter-generational risk-sharing were discussed, but if these are achievable it would only be in the context of a universal and mandatory system. It is very difficult to see how such gains could be achieved through schemes based on individual employers with voluntary participation.

In the absence of any real gains, the danger is that we simply repeat history. Occupational pensions in the UK during their growth period were in fact defined ambition. Employers were protected from unforeseen costs because they did not guarantee the obligations of their pension schemes. They could walk away from their pension schemes; the power

of pension fund trustees to demand support from the employer was generally very limited. Inflation protection was generally discretionary. The cost of providing pensions was kept manageable by the poor treatment of early leavers (whom the employer had little interest in protecting).

The losses to pensioners when poorly capitalised pension schemes failed, the erosion of pensions by high inflation, and the unfairness and restrictions on labour mobility caused by the treatment of early leavers has led over the last 40–50 years to the regulation of pension schemes that turned DA into DB. It is hard to believe that Governments of the future will forbear from improving the security of defined ambition schemes as those ambitions get frustrated by unforeseen economic, financial and demographic forces. It seems unlikely that many employers will be willing to express ambitions given the risk that they will be turned into legally binding commitments.

The other general point to make about DA and its variants in a UK context is in relation to governance. Much of the perceived advantage of DA lies in its flexibility. Rights and obligations are not spelled out in advance. In response to unforeseen changes, employers and employees can adjust contributions, the benefits to different categories (younger workers, older workers, deferred pensioners, current pensioners) in a way that is mutually beneficial. For that to work effectively there must be trust, predictability and good governance structures. The UK experience outside the occupational pensions sector has been no more encouraging than the experience inside it. The most obvious DA-like structure in retail financial products is the with profits fund, long the staple of the life insurance industry in the UK. The former Financial Services Authority consultation paper on the with profits sector (Financial Services Authority, 2011) points out that “how firms operate their with-profits funds and ensure they treat their policyholders fairly has been a matter of regulatory concern for some time. ... [Rules and guidance] continue to be scrutinised as the risks inherent in the funds evolve or become more apparent as economic circumstances change. ... The closure to new business of Equitable Life in 2000 highlighted the inadequacy of governance arrangements then in place in firms, and especially the potential for conflicts of interest in the appointed actuary regime, as well as regulatory failings.”



# Conclusions

Countries round the world are placing increasing weight on occupational DC to meet the need to support people in retirement. In designing a DC system, Governments face important choices. The choice will depend on the role that DC pensions are intended to play in the system, and in particular whether the DC pension is intended to provide the bulk of pensioners' income or whether it is to be merely a supplement to other income. Occupational DC, if properly designed, offers people relatively cheap access to the capital markets<sup>13</sup> and considerable flexibility in designing their savings and drawdown strategies to suit their personal circumstances and preferences. In many ways DC pension plans are simple to understand: being invested generally in liquid assets, the individual member knows what he owns, can see what charges are made by financial intermediaries, and has free access to his funds subject only to particular regulatory constraints.

The disadvantages of DC are the obverse of the advantages: the flexibility of contributions means that people may tend to save too little; the transparency of performance means that the risks and uncertainties that are largely unavoidable in long term investing are brutally clear from the variations in the value of the fund; the fact that each person owns their own pot of assets means that each person bears the full weight of wrong investment decisions and poor market performance.

We have seen that some of the problems of DC can be mitigated by designing good defaults, and by restricting choice. We have also looked at the role of guarantees in protecting people from the worst of the investment risks, but have seen that the role they can play is small, and

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13 Annual costs as low as 0.5% of funds under management seem to be achievable (Dobronogov and Murtha, 2005); while these are higher than in DB schemes, they are much lower than for most retail financial products.

they greatly detract from the transparency, simplicity and flexibility that are important advantages of DC schemes.

The collective DC route offers an alternative model to individual DC; it lacks the flexibility and transparency of individual DC, but it does effectively address the problem of adequacy, and also offers possibilities for risk sharing. However, it does depend heavily on a trusted system of governance; members need to be confident not only that the money is managed with competence, but also that the pay-out policy is fair, and that the aims and priorities of the fund will not be subject to arbitrary change. With defined benefit pensions, we have learnt painfully how long-term and unpredicted economic and demographic changes combined with political pressures and legislative interventions can ultimately destroy collective risk-sharing institutions. Hopefully, we will put those lessons to good use if we decide to go down the collective DC route.

## References

- Allianz Global Investors, 2007, "Central and Eastern European Pensions 2007", [www.allianz.com/en/about\\_allianz/sustainability/studies\\_publications/demographic\\_change](http://www.allianz.com/en/about_allianz/sustainability/studies_publications/demographic_change).
- Ashcroft, J., 2009, "Defined-Contribution (DC) Arrangements in Anglo-Saxon Countries", *OECD Working Papers on Insurance and Private Pensions*, 35, OECD publishing, © OECD. doi:10.1787/224843410213.
- Barr, N. and P. Diamond, 2009, "Reforming Pensions: Principles, Analytical Errors and Policy Directions", *International Social Security Review*, 62(2), 5–29.
- Benartzi, S. and Thaler, R., 2004, "Save More Tomorrow: Using Behavioral Economics to Increase Employee Saving", *Journal of Political Economy* 112(1), 164–187.
- Beshears, J., J. Choi, D. Laibson, B. Madrian, 2009, "The Importance of Default Options for Retirement Saving Outcomes: Evidence from the United States", in "Social Security Policy in a Changing Environment", eds J. Brown, J. Liebman and D. Wise, University of Chicago.
- Becker, G. and Stigler, G., 1974, "Law Enforcement, Malfeasance and Compensation of Officers", *Journal of Legal Studies* 3, 1–18.
- Börsch, Alexander, 2009, "Many roads to Rome: Varieties of funded pensions in Europe and Asia", *Pensions* 14, 172–180.
- Benzioni, L., P. Collin-Dufresne, and R. S. Goldstein, 2007, "Portfolio Choice over the Life-Cycle when the Stock and Labor Markets are Cointegrated", *Journal of Finance*, 62(5), 2123–2167.
- Campbell, J. Y. and Viceira, L., 2002, "Strategic Asset Allocation: Portfolio Choice for Long-term Investors", *Oxford University Press*.
- Cannon, E. and I. Tonks, "Compulsory and Voluntary Annuities Markets in the UK", *Exeter University Business School Working Paper* 10/01.
- Cronqvist H., and R. Thaler, 2004, "Design Choices in Privatized Social-Security Systems: Learning from the Swedish Experience", *American Economic Review* 94(2), 424–428.
- Department for Work and Pensions, 2009, "Modelling Collective Defined Contribution Schemes", *Deregulatory Review of Private Pensions*, UK Department for Work and Pensions.
- Department for Work and Pensions, 2013, "Reshaping workplace pensions for future generations: consultation paper", UK Department for Work and Pensions.

- Dobronogov A., and M. Murtha, 2005, "Administrative fees and costs of mandatory private pensions in transition economies", *Journal of Pension Economics and Finance* 4(1), 31–55.
- Esping-Andersen, G., 1990 "The Three Worlds of Welfare Capitalism"; Princeton University Press, Princeton.
- Financial Services Authority, 2011, "Protecting with-profits policyholders"; *Consultation Paper* CP11/5, at [www.fca.org.uk/static/documents/consultation-papers/fsa-cp11-05.pdf](http://www.fca.org.uk/static/documents/consultation-papers/fsa-cp11-05.pdf).
- Gomes, F., L. Kotlikoff and L. Viceira, "Optimal Life-Cycle Investing with Flexible Labor Supply", *American Economic Review* 98(2), 297–303.
- Gollier, C., 2008, "Intergenerational risk-sharing and risk-taking of a pension fund", *Journal of Public Economics* 92(5–6), 1463–1485.
- Goyal, A., and I. Welch, 2008, "A Comprehensive Look at the Empirical Performance of Equity Premium Prediction", *Review of Financial Studies*, 21(4), 1455–1508.
- Grinblatt M., S. Titman and R. Wermers, 1995, "Momentum Investment Strategies, Portfolio Performance, and Herding: A Study of Mutual Fund Behavior", *American Economic Review* 85(5), 1088–1105.
- Fernandez, P., 2010, "The Equity Premium in 150 Textbooks"; available at SSRN: <http://ssrn.com/abstract=1473225> or <http://dx.doi.org/10.2139/ssrn.1473225>.
- Kritzer, Barbara, 2008, "Chile's Next Generation Pension Reform", *Social Security Bulletin*, 68(2), US Social Security Administration.
- Hannah, L., 1986, "Inventing retirement: the development of occupational pensions in Britain"; Cambridge University Press.
- Huang, J-Z., and M. Huang, 2012, "How much of the Corporate-Treasury yield spread is due to credit risk?", *The Review of Asset Pricing Studies* 2(2), 153–202.
- Ippolito, R.A., 1997, "Pension Plans and Employee Performance: Evidence, Analysis, and Policy"; Chicago and London, University of Chicago Press.
- Laibson, D. I., Repetto, A. & Tobacman, J., 1998, "Self control and saving for retirement", *Brookings Papers on Economic Activity* 1, 91–172.
- Lazear, E.P., 1979, "Why Is There Mandatory Retirement?"; *Journal of Political Economy* 87, 1261–84.
- Lazear, E.P., 1983, "Pensions as Severance Pay", in Bodie, Z. and Shoven, J.B. (eds), "Financial Aspects of the US Pension System"; *National Bureau of Economic Research Project Report series*, Chicago and London, University of Chicago Press.
- Lettau M., and S. Ludvigson, 2001, "Consumption, Aggregate Wealth, and Expected Stock Returns", *Journal of Finance* 56(3), 815–849.
- McCarthy D and A. Neuberger, 2004, "Pensions Policy: Evidence on Aspects of Saving Behaviour and Capital Markets", *Centre for Economic Policy Research (CEPR)*, London.
- Munnell A., F. Golub-Sass, and D. Muldoon, 2009, "An Update on 401(k) Plans: Insights from the 2007 SCF"; *Center for Retirement Research at Boston College* 9–5, 1–17.
- Nessmith, W., S. Utkus, and J. Young, 2007, "Measuring the Effectiveness of Automatic Enrollment", vol 31, Valley Forge, PA: Vanguard Center for Retirement Research.
- Office for National Statistics, 2013, "Pensions Trends", chapter 6.

- Organisation for Economic Cooperation and Development, 2011, "Pensions at a Glance 2011: Retirement-Income Systems in OECD and G20 Countries"; [www.oecd.org/els/social/pensions/PAG](http://www.oecd.org/els/social/pensions/PAG).
- Palmer, Edward, 2007, "Hungary – Pension reform and the development of pension systems: an evaluation of World Bank assistance"; World Bank.
- PSCA (Plan Sponsor Council of America), 2011a, 54th Annual Survey, [www.pzca.org](http://www.pzca.org).
- PSCA (Plan Sponsor Council of America), 2011b, "401(k) Plan Response to Current Conditions"; [www.pzca.org](http://www.pzca.org).
- Salop, Joanne and Steven Salop, 1976, "Self-selection and turnover in the labour market"; *Quarterly Journal of Economics*, 91, 619–28.
- Simonovits, Andras, 2011, "International Economic Crisis and the Hungarian Pension Reform"; *Working Paper MT-DP-2011/11*, Institute of Economics, Hungarian Academy of Sciences.
- Sunstein, C. and R. Thaler, 2008, "Nudge: Improving Decisions about Health, Wealth, and Happiness"; Yale University Press.
- Viceira, L, 2007, "Life Cycle Funds"; available at SSRN <http://ssrn.com/abstract=988362>.
- Yaari, M., 1965, "Uncertain Lifetime, Life Insurance and the Theory of the Consumer"; *Review of Economic Studies* 32, 137–50.
- Yoo, K-Y, and A. de Serres, 2004, "Tax treatment of private pension savings in OECD countries"; *OECD Economic Studies* 39(2).

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Around the world there has been a shift from defined benefit (DB) to defined contribution (DC) schemes for providing occupational pensions. This guide explores the variety of designs of DC, and considers their strengths and weaknesses. It looks at experience around the world, and also considers the principal design areas such as contribution rates, investment policy, decumulation and governance. Finally this paper offers some observations on the current pensions debate in the UK.

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