

The Case for Collective DC

A new opportunity for UK pensions

November 2013 (updated June 2020)

Introduction

This paper sets out the case for the introduction of Collective Defined Contribution (CDC) plans in the UK. These are risk-sharing plans widely used in several other countries but not currently permitted in the UK.

We have conducted significant research and analysis into the design of CDC plans and the advantages and disadvantages of these plans compared with current pension arrangements. We have developed some sophisticated modelling looking at both the historic and prospective performance of these plans.

Our modelling suggests it is feasible to design a CDC plan in which:

- Members collectively bear the investment and other risks of the plan (no employer guarantee is required).
- Members can expect to receive a higher average pension than from a DC Lifestyle alternative (for the same level of contributions).
- Accruing pensions are more predictable for members than a traditional DC Lifestyle alternative, and more stable over successive cohorts of retirees.

The results of our modelling are summarised in the body of this paper.

CDC plans have some powerful, positive aspects that should improve retirement outcomes for many UK workers – collective investment by professionals not members, benefits expressed in income terms not capital accounts, and not having to buy an annuity at poor times in the market, to name but a few. Equally we accept that there are some challenges posed by CDC plans – but as our analysis shows, we do not believe any of these are insurmountable.

Collective DC may not be the perfect pensions system – but there again, most other UK pension designs have been shown to have significant flaws. In our view CDC plans deserve a chance to demonstrate how they can deliver better member outcomes for generations of UK employees.

1. The context – why do we need Collective DC?

Defined ambition

In November 2012 the Department for Work and Pensions launched an initiative titled “Reinvigorating workplace pensions”¹. This venture carried an umbrella heading of Defined Ambition plans and the Pensions Minister Steve Webb said that “Our work on “Defined Ambition” pensions is a key part of establishing a future pension landscape that meets consumer needs, rebuilds confidence in the system and ensures good outcomes in retirement.” There were three broad work-strands under the overall heading of Defined Ambition plans:

- DB Lite (removing guaranteed and ancillary benefits to make defined benefit (DB) plans less “toxic”)
- DC plus (adding in guarantees and more certainty to Defined Contribution (DC) plans) and
- a final strand of Collective DC (CDC) and larger scale solutions.

This paper looks at the potential for CDC to improve pension outcomes for members in the UK. In November 2013², the DWP confirmed that CDC was one of the areas under the Defined Ambition banner that they felt was worthy of further consideration.

The context

The initiative on Defined Ambition plans takes place against a background where DC pension provision is the dominant form of provision for the vast majority of active members of workplace pensions in the private sector.

The Pensions Policy Institute project that by 2020 there will be 16m active members of DC schemes and just 1m active members of DB schemes³.

The reasons for the decline of traditional defined benefit plans are well known and have been extensively rehearsed and are not repeated here, but can be found in eg, PPI research⁴ It is clear to us, based on our conversations with clients, that the majority of private sector employers, in the near future at least, will simply not contemplate the provision of DB plans, given their much-publicised ability to wreak havoc on corporate balance sheets and, increasingly in recent years, their very large demands on corporate cash flows and management time.

The basic premise

The basic contention of this paper is that CDC plans can deliver better member outcomes than conventional DC schemes by virtue of pooling the assets and permitting the taking of pension risk in a different fashion.

What is a Collective DC plan?

Collective DC (CDC) is normally used to describe a pension plan where the employer and employee contribution rates are fixed as for conventional DC (in the sense that once a contribution is paid, there will be no retrospective adjustment or supplementary contribution needed). However, in a CDC plan all the assets are pooled rather than each member having an actual or notional pot of money earmarked for their benefits. A CDC plan is firmly in the Defined Ambition “spectrum” because it has the ambition (but, in our definition, not the promise or guarantee) of a certain level of pension.

The initial amount of CDC pension is set at the level which is expected to be provided based on the contributions payable by and in respect of the member. The aim is that the amount of the pension should be adjusted each year in line with inflation. The age at which the pension could be paid might also change to reflect expected increases in future life expectancy.

However:

- If investment returns are better than expected, higher increases — bonuses — could be provided both pre and post retirement (including for pensions in payment).
- If investment returns are worse than expected or other factors adversely affect the finances of the plan, then lower increases would be provided in order to ensure that the cost remains constant. In extreme circumstances benefits for members — including pensions in payment — may have to be reduced in order to ensure that the cost does not increase beyond that supported by the plan assets.

Consequences of CDC design

Our definition of a CDC plan (without guarantees) is first and foremost one that is treated as a Defined Contribution arrangement for the purposes of the employer’s company balance sheet, profit and loss statement, cash funding obligations and any potential future (European) solvency requirements. There must be no accounting or retrospective cash flow issues with our definition of a CDC plan. The collective nature means that the assets are pooled rather than being allocated to each individual member. Investment policy is conducted on an aggregate basis without the need for individual member involvement or decisions. Benefits are expressed in pension terms for members rather than the capital value of an account in the name of an individual member.

Is conventional DC sufficient?

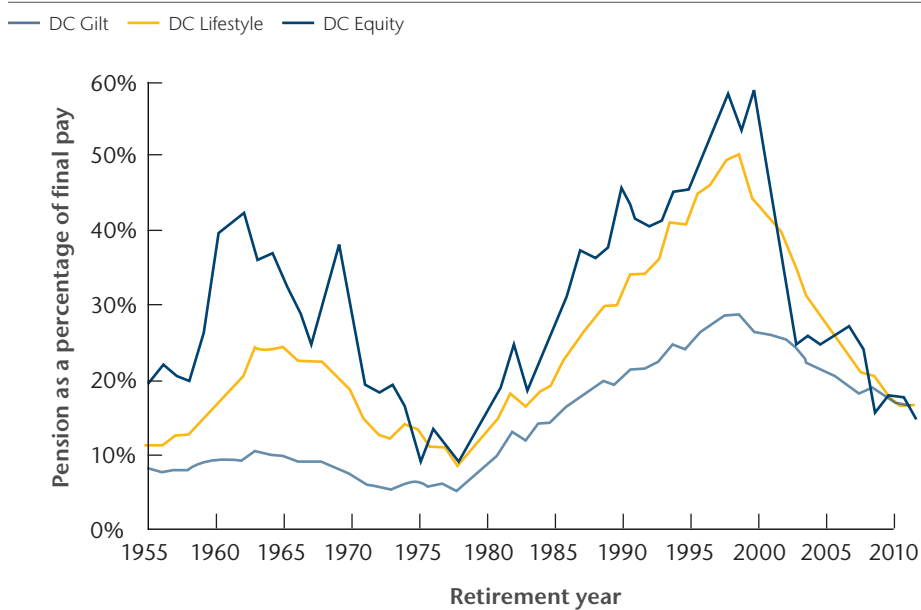
Before looking at the detail of CDC plans, it is worth asking whether these plans are needed at all — or is conventional DC sufficient? There are a number of features of conventional DC schemes that need to be addressed if outcomes for members are to be improved. The most basic of these is to increase the level of contributions being paid by and in respect of members. Clearly this is an issue for employers and society at large to decide and it is not an inherent feature of CDC plans that they enjoy higher contributions. (We note in passing however, that in the Netherlands, home of the best global examples of CDC, typical contributions to pension saving are significantly higher than in the UK).

The purpose of our analysis of CDC plans is to consider whether better outcomes can be obtained for each unit of contribution. Our contention and our modelling support the conclusion that not only can higher pensions be delivered, but there will be less variable or volatile outcomes for members.

DC Volatility

The inherent uncertainty attaching to conventional DC schemes is summarised in Chart 1 below, which is based on a submission to the Work and Pensions Committee on Governance and Best Practice in Workplace Pension Provision⁵. This shows the pension that a member would receive from a conventional, but well-governed and low cost, DC scheme following either an equity orientated investment policy, a bond-based policy or a conventional lifestyle policy pre-retirement, followed in each case by annuity purchase. Under the lifestyle policy, the member is invested in equities until 10 years prior to retirement date, and then progressively switches from equities to bonds so that the portfolio is 100% bond invested to match the price of an annuity on retirement more closely. The diagram shows the pension as a percentage of final salary for a member participating in a DC scheme and contributing 10% of pay for 25 years before retiring on the date shown. Full technical details are set out in Appendix A.

Chart 1 – Historic DC outcomes



Historic DC outcomes

The chart shows vividly the extreme range of outcomes a member might have experienced — ranging between 6% and 60% of final pay. This range of uncertainty is made all the worse since members generally have little control over when they retire — or rather they have historically had little choice. With the abolition of the Default Retirement Age from October 2011⁶, imposition of a compulsory retirement age is not possible, and so inadequate (DC-based) retirement outcomes are likely to lead to members deferring their retirement. This transfers the problem of inadequate outcomes from employees to their employers.

Fair comparisons?

There are many other potential problems with conventional DC schemes which can be addressed through Collective DC plans. Equally in many cases the solutions that can be adopted for CDC plans can be copied across directly to conventional DC schemes. By way of example (this theme is developed further below) many have argued that CDC plans offer superior economies of scale, lower charges and better investment outcomes compared with conventional DC schemes. In our view this is not an inherent weakness of conventional DC schemes, since there are examples of excellent governance and low charges in some DC schemes and examples of best practice in investment matters. Equally it is true that there are many poor examples in the DC space, where charges are high and members remain invested in products and units which no longer best serve their purpose.

Our modelling assumes no inherent advantages of lower charges or superior investment returns in CDC plans compared with DC schemes; we are comparing a well governed, low-cost CDC plan to a similarly well governed, low-cost DC scheme.

Collective advantages

In our view the two strongest advantages of CDC plans over the best of DC solutions found in the market at present are:

- The fact that pensions are paid from the plan rather than being purchased by way of annuities in the open market means that greater amounts can be held in return seeking assets, thereby leading to superior expected outcomes. Annuities backed by bonds represent poor investment decisions, if expected pension lifetimes are 25 or 30 years or even more. In addition, avoiding an annuity purchase means that the profit margin and cost of capital for an insurer are avoided, and more of the assets are applied to improving members' benefits.
- The mixture of risk that can be taken on behalf of plan members allows optimisation of investment returns over time and avoids decisions being driven by short-term issues. For example it is generally agreed⁷ that annuity rates at the present time in the UK represent poor value for money — not because of the inherent design of the product but simply because yields on government bonds are at all-time lows. In a CDC plan the decision to buy annuities or government bonds could be avoided altogether or deferred until more favourable rates prevailed.

2. Plan design and basic principles

Multiple designs

One of the strengths — and weaknesses — of the CDC concept is that many design options are possible. A wide range of plan designs can be accommodated under the CDC banner and each would have a very different experience for members in terms of ease of understanding, variability of outcomes, biases or protections for different plan participants, degrees of smoothing needed between generations, riskiness of underlying investment policy and so forth. This huge range can make it difficult to separate out and focus on the underlying characteristics of CDC plans and what they might offer relative to conventional DC schemes. One approach would be to “let a thousand flowers bloom” and offer a regulatory framework that permitted a wide range of CDC options, with market forces leading to best solutions that adapt over time. While we can see the logic of this, in order to gain broader public acceptance and understanding of CDC plans, we favour a restricted “menu” of CDC plan design choices.

Plan design components

There are a number of components that need to be captured in order to understand the essence of any specific CDC plan:

- The contributions payable to the plan by members and / or the sponsor.
- The overall benefit style as presented to members — a DB style pension, a points based system, a controlled risk DC scheme etc.
- The bonus policy that sets out how benefits will be adjusted in the light of emerging experience.
- The investment and risk management policies underlying the plan’s assets.
- We illustrate these design principles with two selected plans below — an illustrative Career Average plan and a points based system suggested by Ray Martin. Other designs are considered in the international section later. Governance issues are also considered later.

Illustrative career average plan design

- The contributions payable to the plan are 10% of a member's salary – all paid by employer (ie, no member contributions).
- The target benefits from the plan are based on 1% of career averaged salary, with CPI revaluation payable from age 65. In other words a member joining the plan with 25 years to retirement would consider his target pension to be 25% of his revalued career average pay.
- There is an attaching spouse's pension payable at a 50% rate if the member dies after retirement.
- Pensioner benefits are paid from the plan during retirement, rather than being bought out with an annuity provider.
- There are targeted revaluations of all benefits under the plan of 100% of CPI (subject to a floor of 0%, with no cap). This revaluation applies uniformly to benefits earned by active members, deferred benefits and pensions in payment.
- We have assumed a very simple investment policy – assets are assumed to be 60% in return seeking assets (UK equities) and 40% in matching assets (UK government bonds). We can compare this with a member of a DC lifestyle scheme – who will be in return seeking assets for most of his active membership, switching effectively to bonds in the run-up to retirement and subsequently in retirement (through the purchase of an annuity). In the CDC plan however the investment policy can be maintained throughout the period of the member's retirement – the investment in return seeking assets is taken in a different fashion over a different timeframe; it reduces the concentration of risk at any point in time.

CARE plan – bonus policy

- Each year the plan's funding level (value of the assets divided by value of the liabilities) is measured, based on the CARE-style benefits which have accrued up to that point in time.
- The funding assessment is performed using a market value of assets and a set of market-consistent best estimate assumptions for valuing the plan liabilities.
- At each valuation benefits are adjusted, if necessary, to keep the funding level within a window of 90%-110%.
- If the funding level is outside the 90-110% window, then the following adjustments (in order) are made to return the funding level to 90% or 110% as appropriate by:
 - (i) Revaluation target for the current and all future years is changed via a uniform percentage adjustment up or down, with the resulting revaluation subject to a zero floor;
 - (ii) One-off benefit reduction (applied as a fixed percentage uniformly to all members).

Pensions in payment are exposed to both levers (i) and (ii) above.

Observations

This offers a plan which is most DB-like in design, to aid ease of comprehension by members. There are many potential variations in terms of accrual rates, pension ages, width of the funding gates, bonus policy etc.

One of the key concerns that we have tried to address — discussed further in the Modelling section below — is around protection for pensioners. We understand that there are serious concerns about the prospect — however remote — of CDC plans having to cut pension in payment. One way to mitigate this is to limit the exposure of pensioners to benefit cuts, and to compensate for this by making the bonuses for active and deferred members more variable. We have looked at ways in which older pensioners could be progressively protected from the adjustment in (ii) above. Our initial work suggests this can be accommodated without significantly adding to the risks of other plan members.

Ray Martin's design

In June 2013 Ray Martin (then Royal Bank of Scotland head of pensions and benefits) was announced as the winner of the £15,000 Defined Ambition Competition 2013 — run by Professional Pensions and Barnett Waddingham — for his Pension Points Builder Plan⁸. This was a CDC plan with the following design features:

- Contributions by and on behalf of a member are applied to buy Pension Points. A Pension Point would secure a pension from Pension Maturity Age (age 67) of £1 per month, or £12 per annum.
- The purchase terms for Pension Points would vary by age and would be set each year by an independent party — the Government Actuary,
- Pension Points increase in value each year in line with CPI and would be subject to annual adjustment in the light of the financial condition of the plan.
- The Trustee would have an investment goal to achieve a return over a long period (10 to 20 years) of 3% above Consumer Price Inflation, with the least amount of annual volatility. It would appoint a team of professional investors to help it achieve this goal.

Pension points — bonus policy

- If the Plan is more than 110% funded then the excess can be either retained by the Trustee as an additional reserve or distributed to members through Bonus Pension Points. The reserve cannot exceed 25% of the value of the Plan's liabilities.
- Any Bonus Pension Points granted will be given equally in proportion to the number of Pension Points earned to date by each member, regardless of whether the member is a current contributor, a former contributor, or in receipt of a pension.
- If the Funding level is below 100%, the Trustee must decide what action it will take. If it is above 95% the Trustee can decide that future investment returns are likely to increase the funding level back above 100% and take no further action.
- If the funding level is below 95% then the Trustee must decide what action to take to restore the Funding level to above 95%. The Trustee's first course of action must be to reduce previously allocated Bonus Pension Points evenly across all members. They may reduce all Bonus Pension Points evenly across all years of grant or they may start with those most recently allocated.
- If after cancelling all Bonus Pension Points the funding level is below 95% then the Trustee must consult with the Pensions Regulator over what further action it should take.

Observation

The points based system enables the value or cost of the basic benefit — the pension point itself — to vary by age and so take on board expected future returns. It does this at the cost of being less clear to members — it would be virtually impossible for a member to work out their expected number of future points throughout their career, and so plan for their retirement. The way suggested around this is to have a website — accessible using modern technology such as smart phones — which does the calculations for the member, and presents results in a more easily understandable format.

The version of this points based system, as described, does not have the revaluation “levers” that are a feature of our design — but we note these can be added, without taking away from the underlying points design.

Benefits cuts

One of the concerns about the operation of CDC plans is the potential that pensions in payment may need to be cut in extreme circumstances to keep the plan financially sound. This is happening at present among Dutch CDC plans — the Dutch regulator reported that 66 of 415 Dutch plans had been forced to cut benefits by an average of 1.9%⁹. It is possible to address these concerns — at a price. If older members are more protected then younger members will be more vulnerable to unfavourable benefit adjustments or benefit cuts.

One method to offer greater protection to pensioners is to secure annuities in the external market for them at the point of retirement. Rather than purchasing a fully indexed linked pension, the plan could purchase a level annuity for the member. This would guarantee a base level of income regardless of future experience. However to the extent that the premium to purchase the annuity would leave the CDC plan assets, the pool of assets would be correspondingly smaller, and there would be less opportunity to generate higher long-term returns.

If the annuity purchased were a fully index linked annuity, the CDC plan would now resemble a conventional DC plan. Various compromises would be possible, in addition to the purchase of a level annuity as above — topping up the level annuity purchase at regular (eg, three yearly) intervals, or as market conditions dictate. The purchase of annuities could be deferred, or timed by the trustees of the plan. But our modelling suggests that the opportunity cost is greater than the additional security gained. Consequently, we favour a model that does not involve annuity purchase, but does deliver greater protection for older members by way of a non-uniform bonus distribution policy.

An alternative route to pension security

We have modelled an alternative approach that could offer greater security for pensioner members. Pensions would continue to be paid from the plan, but the bonus distribution policy would be skewed rather than operating as a uniform adjustment for all members. This revised policy progressively phases out the full benefit adjustment over the ages of 65 to 75. A pensioner at age 65 is subject to the full annual adjustment, whereas a 75 year old pensioner suffers none. After age 75 they are protected against benefit cuts as a priority over all other benefits. Clearly the choice of ages is rather arbitrary and would be an issue for the scheme design phase. The age of 65 in the above example could be a fixed age, or more helpfully it could be an age which increases in line with improvements in life expectancy.

Less variation for one group of members in a collective plan means greater variability for the remaining members, and so the question we have asked in our modelling is whether the risk transfer to younger members is unfair, in that they have too much risk with insufficient upside. Based on our initial modelling, we believe that a CDC plan can be designed with significant protection for older members, and without compromising the risk exposure for younger members.

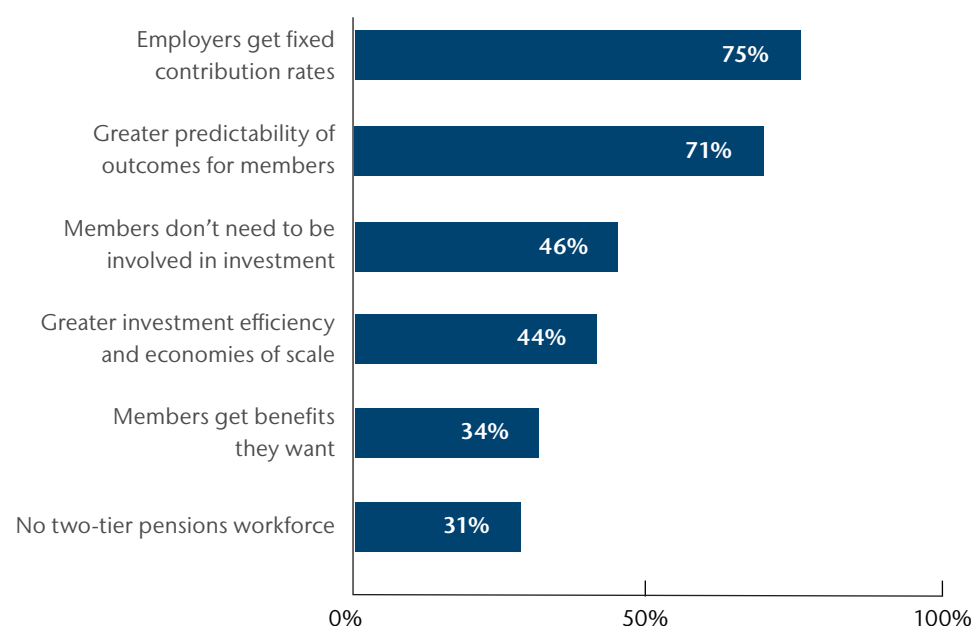
3. CDC – the attractions

Attractions

In this section we look at the positive features of CDC plans. The UK section of the 2013 Aon Global Pension Risk survey received 241 responses covering some 222 plans with over three million members and around £300 billion of assets – a very powerful representative survey¹⁰.

We asked respondents what they saw as the major advantages of Defined Ambition plans – the results are illustrated in Chart 2 below.

Chart 2 – What do you see as the biggest positive of Defined Ambition plans?



Source: Aon Global Pension Risk 2013 Survey; Sample size 241

The biggest positives

The two biggest positives highlighted above focus on matters from the employer and then the member perspectives. The employer requires certainty this is a DC scheme – a central plank of our whole investigation of this concept, but one which needs to be addressed to ensure employers are sufficiently confident if they embark on a plan like this. The greater predictability of outcomes for members is a reflection of the inherent unpredictability of outcomes from existing DC schemes. The DC Plus workstrand may offer some possibilities here – but the CDC plan addresses these outcomes more directly.

Investment by professionals not members

Investment policy for a CDC plan will be carried out by professional trustees acting on behalf of members. There would be no need for individual member involvement in investment decisions. There is repeated evidence (eg, Byrne (2007)¹¹, Choi et al (2011)¹², Lusardi and Mitchell (2007)¹³ that members are unwilling or unable to take the complex investment decisions required under a DC scheme. The strongest evidence for this in the UK comes in the widespread adoption of default investment options¹⁴. In effect default funds represent attempts to optimise the investment decisions on behalf of the members so that they are personally relieved of this process. A CDC plan does this more directly by simply not involving members in investment decisions and leaves the choice to professional trustees.

Superior investment choices

The collective approach to investment decisions potentially delivers access to the best expertise available in the marketplace. There are many areas in current DC schemes where investment options are sub optimal. For example one of the major drawbacks of contract-based group personal pensions is that member consent is required to effect investment switches. Even if there is in place an investment governance committee (designed to look at the range of investment options offered to members and change these over time) they are powerless to switch members out of existing range. As such there are many members in contract-based arrangements where the investment is, for example, a passive UK equity tracker fund which was implemented 10 to 15 years ago and would have been considered leading-edge at the time.

Costs

Many members of DC schemes are bearing excessive investment and administration charges – the OFT report into DC outcomes stresses this. This often reflects the fact that the arrangements were set up when commission was payable to intermediaries and this was reflected in higher deductions from members' accounts.

Of course in modern well-designed schemes – notably those adopted for compliance with auto-enrolment – high charges are not a necessity. Charges can be negotiated competitively for the right groups of employees and access to the best investment thinking delivered.

Wider investment options

The use of larger investment pools should enable access to a wider range of better-performing asset managers and some of the more esoteric asset categories, both of which might be excluded from conventional DC arrangements. CDC plans can also take a longer-term view and invest more of their assets in illiquid investment categories such as infrastructure, mortgages and other investments. These can prove an excellent diversifier of investment returns and are difficult to incorporate into conventional DC plans where the prevalence of daily pricing and daily dealing makes the illiquid nature problematic – and there is no long-term pooling of investment risk.

Account blindness

In our CDC plan design, benefits for members would be expressed in pension income terms. Repeated evidence suggests that account blindness leads members to underestimate the amount they need to save for an adequate retirement. In part this is because members underestimate their own life expectancy. An IFS report¹⁵ suggests that men (women) aged 50–60 underestimate their life expectancy on average by around 2 (4) years – leading to underestimates of how much they need to save for retirement (and contributing to the perception that annuities are poor value for money). A member with £100,000 in a DC account may feel a significant source of security from his pension saving but converting that into an income of a mere £50 per week may feel less than satisfactory. CDC plans express benefits in terms of income that can be related to the member's standard of living and should facilitate retirement planning.

Investment efficiency

A CDC plan can invest in return seeking assets over the longer term because annuity purchase is not necessary. Since equities and other reward seeking assets are expected to give higher returns than long dated government bonds and cash, the CDC plan could deliver higher benefits. Modelling by the Government Actuary's Department¹⁶ concluded:

"CDC plans do appear to exhibit superior performance on average when compared to conventional DC plans. In theory this improvement is in the order of 20 to 25 per cent, but in the simulation it is as high as 39 per cent for some members."

Bigger and more stable pensions

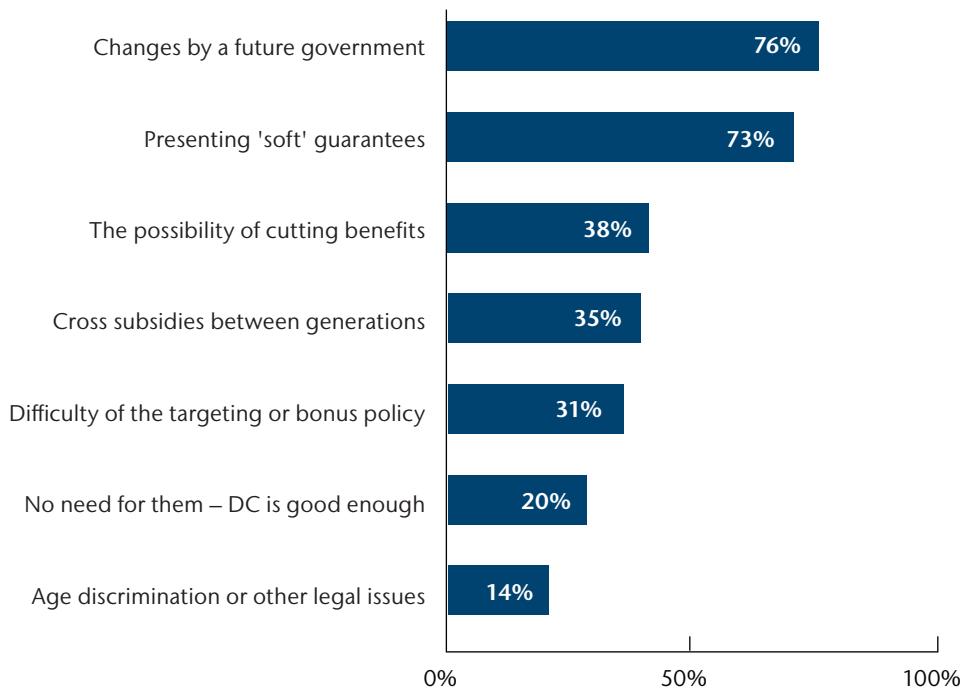
In 2012 the RSA¹⁷ undertook a review of the literature comparing the outcomes of individual and collective pensions. They reported on six studies (including the GAD study above). They reported that "all (studies) showed significantly better outcomes for collective pensions of 25% or more". These studies were based on informed estimates of likely costs and returns. Our own modelling supports these conclusions, although perhaps not for the same reasons as some of the studies included in the RSA analysis. In our modelling we have taken no credit for any increased returns from the assets underlying CDC plans – nor any lower charges. In both cases this could be seen as "generous" and crediting existing DC schemes with superior returns and lower charges than are actually found in practice. Our view is that we should focus on improving both the returns and reducing the costs associated with DC schemes, since that will directly benefit members in these schemes. Our modelling assumes these improvements occur in DC schemes, and even then we still see superior outcomes for CDC plans, in terms of both the overall level of benefit and reduced variability of outcomes for members.

4. CDC – the concerns

Concerns

In our dealings with potential sponsors of CDC plans two issues dominate their concerns. The first of these is of legislative creep and the second is the problem of explanation. Chart 3 below, using results from the Aon 2013 Global Pension Risk survey, illustrates this quite clearly¹⁰.

Chart 3 – What do you see as the biggest disadvantages of Defined Ambition plans?



Source: Aon Global Pension Risk 2013 Survey: Sample size 241

Regulatory creep

The biggest concern expressed to us is that sponsors will be reluctant to establish CDC plans because they fear that, at some unspecified future date, legislation governing them will become progressively tightened or amended and convert them to something more onerous than anticipated. Sponsors cite the legislation covering defined benefit schemes – for example the obligation to provide benefits to early leavers, to provide inflation protection to benefits in payment, to indexation and revaluation of early leavers' benefits, pension protection fund levies and so forth. The DWP are well aware of this concern and are understood to be looking at ways of giving employers the protection they seek. The technical difficulties of this should not be underestimated since it is a feature of English law that the government cannot bind its successors. Equally, in some areas, the government are not in control. For example, if the accounting profession decides to treat a CDC plan as some form of constructive obligation, it could require them to be accounted for in the company books as if they were defined benefit plans. And the European pensions legislators may attempt to regulate CDC plans as if they were subject to the full strictures of Solvency III!

Employer protection - the big red button

One approach to guarantee employer protection would be to terminate the CDC plan via a “big red button” option. If the government changes the nature of the CDC plans, the employer could hit this large button which would trigger a requirement for the trustees to initiate a termination of the CDC plan. An actuarial assessment of each member’s interest would take place, and the available assets would be distributed in proportion to each member’s interest. This interest could be secured by transfer to a suitable DC arrangement for active and deferred members. For pensioners this benefit could be secured by way of annuity purchase — which raises the issue of whether the annuity purchase would be for the full value of the annuity at the point of termination, or the annuity that could be purchased with the member’s share of fund. Distribution rules could be adjusted to reflect the latest bonus distribution policy.

Communicating the benefits

The difficulty of communicating benefits from a CDC plan should not be underestimated — although as we have seen over many years, there can be great difficulty in communicating clearly and effectively any type of pension arrangement. It is a delicate balancing act between indicating the level of benefit that the member can expect but at the same time retaining enough of the messaging that these are intentional benefits and not guaranteed benefits. The fact that benefits can be less than those intended, or in extreme circumstances reduced below a base level of benefits, is something that offers great dangers of being misunderstood by members. In our view clarity of the legislation would be one way of ensuring that members understand the reality of their position.

Base benefit reductions will be rare, but will require sensitive handling, and careful pre-positioning. The legislation needs to make it clear that benefits can be reduced in extreme circumstances and that trustees and employers will be protected in these trying times.

Cutting benefits

Mention was made earlier of the report from the Dutch pension regulator that a significant number of Dutch CDC plans were being forced to cut benefits. This is seen as a major downside of CDC plans generally and something which we know the UK Pensions Minister is keen to avoid. It is worth putting some of these points into context.

- One quarter of Dutch CDC plans reported⁹ having to cut pensions by an average of 1.9% in 2012 to restore their funding level.
- These benefit cuts will have priority for restoration, if and when financial conditions improve.
- In the UK, by contrast, the cost of buying an annuity increased by 29% over the three years 2009–12¹⁸. Those persons retiring from a DC plan in 2012 and buying an annuity would have seen a permanent drop in their retirement income of 29% compared with their 2009 colleagues — with no prospect of subsequent review or readjustment.

Benefit cuts may be a drastic last resort for CDC plans — but they may be much preferred to permanent DC reductions. In addition, we believe that careful design can reduce (but not entirely eliminate) the prospect of having to apply these cuts to the most vulnerable of pensioners.

Smoothing is inherently “unfair”

Apart from the inevitable comparisons with with-profit arrangements, one regular criticism levelled at CDC plans is that smoothing of investment returns is unfair. Lesley-Ann Morgan of Schroders¹⁹ (we are not attacking her presentation — it just forms a convenient summary of the purported negative features of CDC) states: *“performance smoothing must cut both ways – some will win and some will lose.”* At an absolute level this must be self-evident — compared with a pure DC arrangement, there will be times when smoothed returns are superior, and times when they are inferior. The problem we face is that there is no way of knowing in advance — or even sometimes after the event! — which of these circumstances will apply.

Smoothing takes away this element of chance. And unlike conventional DC where the member purchases an annuity — the luck of market timing does not have to affect the member’s retirement income forever. Annuity purchase is irrevocable — smoothing is not.

Suppose that we put an offer to two prospective (DC) pension scheme members: *“One of us will get a pension of 20% of pay – the other will get a pension of 30% of pay. There is no way of knowing in advance who will get which pension — (see Chart 1 to understand both the volatility and unpredictability of DC outcomes). Instead, we can both agree to join a CDC plan — in which case we can assume with a high degree of certainty that we will BOTH get pensions of 28% of pay. Shall we join the CDC plan or go our own separate DC ways?”* Faced with a smoothing decision in these terms, we suspect most members would prefer the collective approach!

There is a significant body of academic evidence which supports collective investment — eg, Cui et al. (2011)²⁰ argue that collective plans can be welfare enhancing compared to optimal individual investment because of efficient risk sharing. Gollier (2008)²¹ concludes that collective plans make it socially efficient to raise the collective risk exposure to take advantage of the equity risk premium, through the means of intergenerational risk sharing.

Gaming the system

Following on from the comments above about smoothing, Morgan¹⁹ argues that members would be able to select against the CDC plan, by transferring in or out at a time when smoothing was operating in their favour. So for example if smoothed returns are higher than market returns, members might seek to lock in “profits” by transferring out.

Apart from the remarkable degree of financial acumen demonstrated by such members, this is not an inherent weakness of CDC plans. In our governance framework, any transfers in or out would take place at market equivalent prices — so that members would receive a “share of fund” value. So if assets had fallen by 20% for example, members might only see a 1% fall in their annual revaluation awards — but any external transfer would fall by the full 20%. This can be considered as comparable to the “Market Value Adjustments” that we came to know and love in with-profit funds, except in this case there is no obvious “face value” of the account against which to compare the (apparently reduced) transfer value.

Lack of investment choice

Morgan¹⁹ cautions that the lack of investment choice is a weakness of CDC plans: *“The Governors of the CDC face the risk that a single investment option will not be suitable for all members, but members cannot choose anything different”*. We take the opposite view and see lack of investment choice as a positive. The evidence¹¹ is that members are unwilling or unable to take effective investment decisions for something as complex as long-term pension investment – matters are better dealt with by professionals on their behalf. And under our suggested framework, CDC plans would be funded solely by way of employer contributions, with a separate conventional DC scheme available for any further contributions the member themselves wished to make (see Appendix C – contributions). So individuals would retain all the attendant choice that a DC scheme offers in respect of their own contributions.

There is however a rather more subtle point in here. It can be argued that collective investment is sub-optimal compared to having a more focussed DC approach, under which greater emphasis is placed on return-seeking assets for younger members and more emphasis on secure assets for older members. There have been suggestions that a CDC plan could have two internal asset pools to address these needs and move members between them over time (eg, Bams et al²²). We would see this as a design variation of CDC plans that could emerge over time, or even be adopted up front by a progressive CDC plan.

New legislation needed

New legislation would be required to cover the governance of CDC plans and we would support this since it enables some of the key features to be made explicit. The latest DWP research paper² also comes to this conclusion.

Taxation of CDC plans

CDC plans do not currently exist, and so the post A-Day tax system does not deal with them adequately – or at all. Assessing the value of the pension input amount for a CDC plan like our illustrated benefits design is not straightforward. The DB-like nature of the target pension suggests that the *“16 times increase in value of benefit”* for DB schemes may be appropriate. However unlike conventional DB benefits, the benefit added for a CDC plan member may be adjusted subsequently – or as we have noted, in extreme cases even reduced. So instead our thought is that the obvious approach is to calculate the pension input amount as the annual contribution level in the plan. This is by no means perfect, since while it is true that the CDC plan collective assets increase by (in our example) 10% of members’ pay, that benefit is not uniformly distributed across all members, as it would be in a conventional DC scheme. But we could consider that members receive a fixed contribution like a conventional DC plan (no subsequent adjustment in the event of underfunding etc) and the collective nature is merely an alternative way of investing that fixed contribution. Adjustments on account of subsequent investment performance (and bonus allocations) would be ignored in CDC plans, just as they are in conventional DC schemes for pension input purposes.

Another potential issue would be how to place a value on a CDC plan pension in payment. In most of our modelling, the pensioner member is still exposed to at least part of the revaluation increases, and the expected value of the pension is higher than a *“pure”* index-linked pension. Some assessment would be made of the pension at the point of crystallisation – say 22 times the pension, compared with the standard DB valuation at 20 times the initial pension. This assessment would depend on the bonus policy of the CDC plan and the prospective increases the pensioner would accrue.

5. Governance of CDC plans

Governance framework

In Appendix C we provide outline proposals for a governance framework for CDC plans in the UK. At its fullest level there could be significant flexibility in the design and regulation of plans which fall under the CDC or even Defined Ambition banner. While we support flexibility we believe there is merit in pushing (at least initially) for a restricted series of design options so that they can be more fully appreciated by the public and all those involved in pensions.

Trust-based framework

Our basic view would be that CDC plans should be operated in a trust environment where the trustees operate at arm's length from the employer(s) or sponsor(s). The trustees have a principal requirement to manage the finances of the plan to award equitable distribution of investment returns to different generations of plan members. Trustees involved with governance of CDC plans would need a high level of knowledge and competence in investment and funding matters and would most likely be professionally qualified.

A strong regulatory framework

We support the concepts described in the DWP consultation paper – Reshaping workplace pensions for future generations² – that our model of CDC plans (without guarantees) should be subject to a high level of regulatory oversight. These plans rely on a high degree of public confidence, which in turn requires regular communication, transparency of operation and the reassurance of a focussed, powerful regulator. In our model, The Pensions Regulator would receive all of the documentation governing the financial operation of the plan as described below. They would receive copies of communications to members, so they could ensure that members were being given realistic presentations of the expectations of the benefits they would receive. And the Regulator would have powers of intervention if they felt that the benefits promised were inconsistent with the investment policies and assets backing the plan.

While this might sound a heavy regulatory overhead, in practice we expect relatively few, but large, CDC plans and so the costs of regulation should not be excessive.

The CDC Public Website (“CDCPW”)

We believe that much could be achieved if the trustees’ approach to financial management were open and transparent to public scrutiny. We recommend the establishment of a public website which contains all key documents relating to financial management of the plans. In recommending this we are not suggesting that members themselves will flock to this website, but we do expect informed commentators in the pensions environment to do so. The pressure of this public scrutiny will quickly identify those schemes that are outliers and/or are taking excessive risks relative to the benefits promised to their members, or are failing to take the tough decisions that might be needed to restore financial stability. We can harness the collective power and analysis of all parties involved in retirement planning via the Internet and other social media as a powerful incentive to deliver financial processes that match members’ expectations.

Inferior collective governance?

Morgan¹⁹ suggests that the governance arrangements for CDC plans will be inferior to other governance structures. This is partly because of the use of “*less suitably experienced people*” who are often “*slower to implement new ideas*”. The article cites DWP research²³ that employers were sceptical that “*given the complexity of CDC scheme, trustees would have sufficient experience to make investment decisions*”.

This supports our view that there is little room for “generalist” trustees in the management of CDC plans, and that paid, professional independent trustees may be required.

Legal matters

There are aspects of CDC plans that would require adjustment or amendment of existing pensions legislation (and taxation issues). A number of these are highlighted in the DWP's latest research paper² and we have discussed these extensively with our legal contacts and representatives of the Association of Pensions Lawyers. While we do not purport to give legal conclusions, our extensive analysis and conversations with the lawyers have not identified any “show stoppers” that would prevent the introduction and operation of CDC plans. A flavour of some of the issues discussed and potential responses are set out below:

- Some DB legislation such as Section 67 of the Pensions Act 1995 and statutory indexation and revaluation of benefits could apply to CDC. Carve out CDC plans from inappropriate DB legislation.
- The legislative definition of “*money purchase benefits*” could cut across the concept of CDC. Amend the definition of money purchase benefits to ensure that CDC plans are not included.
- There are potential tax implications if benefits are reduced (eg, scheme pensions cannot be reduced under Finance Act 2004). If needed, amend FA2004 to allow CDC plan pensions to be reduced if needed to restore the plan to full funding.
- There is the potential for members’ expectations over time to become “*rights*”, in which case the CDC plan would become a DB plan. Ensure standards of clear and consistent member communications, plus tightly drawn legislation, to set and control expectations.
- The CDC plan design involves inter-generational risk sharing – between different cohorts of members of the plan. It may also incorporate bonus policies designed to protect older members – eg, through the tapering we have proposed. This might fall foul of anti-age discrimination legislation. If needed, amend age discrimination legislation to confirm intergenerational sharing (as found elsewhere in Europe).

6. CDC – Doomed to failure (again?)

Strike Three and CDC is out?

In our conversations with other pensions professionals there are two aspects which recur quite regularly which are seen as killing off any further discussion of the merits of CDC plans.

- The government looked at this before and decided against it – nothing has changed to make it more likely to happen now
- This is just a with-profits product in a different disguise – and with-profits is so discredited that we should consider it dead

We look at both of these issues.

Previous DWP analysis

In 2008, as part of its response to the independent deregulatory review, the Government undertook to explore the scope for risk sharing in occupational pensions²⁴. In their response to the consultation on risk sharing the Government stated *“The Government has decided to undertake further work on the detail of how Collective Defined Contribution (CDC) schemes might operate in the UK.”*²⁵. That further work was published in December 2008, drawing on modelling carried out for the DWP by the Government Actuary's Department (GAD)^{16, 23}. However despite the findings that *“the modelling... supports the claims of enhanced performance on average from CDC schemes and of some increased predictability of outcomes compared to DC schemes”* the DWP concluded: *“the Government should take no further action on CDC plans”*.

So what went wrong – and why would matters be any different today?

DWP 2008 analysis

The Government (DWP) analysis identified a number of issues to be addressed, under six headings:

- Level of returns for members
- Predictability of income in retirement
- Intergenerational transfers
- Stability of CDC plans
- Legal implications of CDC plans
- Potential demand for CDC plans

Level of returns for members and predictability of income in retirement

The GAD modelling carried out for the DWP included these conclusions:

- *“CDC schemes do appear to exhibit superior performance on average when compared to conventional DC schemes. In theory this improvement is in the order of 20 to 25 per cent, but in the simulation it is as high as 39 per cent for some members.”*
- *“The GAD results show that in a CDC plan an individual’s starting pension is less dependent on the particular scenario experienced, ie, is less dependent on whether the individual happens to retire in a downturn or in a boom.”*
- *“Relative to DC there is more predictability in an individual’s starting pension”*

So CDC is a system that delivers a pension that is bigger and more stable than conventional DC. Our own latest research and modelling confirms these conclusions, and is set out in detail in Section 8 of this paper.

Intergenerational transfers — 2008 concerns

One of the key aspects of CDC plans is that they do involve risk sharing — not sharing between the member and the company but between different generations of members of the plans. In 2008 the DWP point out one potential pitfall:

“Cross-subsidies arising from the smoothing mechanism are inherent in the modelled CDC plan. They have considerable implications for intergenerational equity.”

Dealing with these issues of smoothing requires very careful communication to members and good actuarial control processes. Dealing with these long-term issues is a core part of actuarial training — but we need to be honest and accept that there may be actual or perceived pressure on actuarial decision-making in this environment. So why not have some robust independent supervision, supported by public scrutiny?

Intergenerational concerns — what might be different now?

Smoothing is an inherent feature of CDC plans — and it is not immediately apparent that members would be prepared to share for their mutual benefit. If anything the culture of individualism has been reinforced over recent years, with the growth of the “me” culture. Perhaps members would prefer a smaller pension pot — as long as it was their pension pot. The dog in the manger may be alive and well.

If we look at the current UK pensions system, we can see that there is huge intergenerational cross subsidy already. In summary, the older generation have well protected, generous defined benefit pensions, while the younger generation has much cheaper, riskier defined contribution pensions. Logic dictates that CDC should be a compelling case over individual arrangements, but it is not obvious to us that the UK is yet ready to embrace collectivism and risk-sharing in this fashion.

Stability of CDC plans — 2008 concerns

In 2008, the DWP flagged up a concern as to whether CDC plans work on a long-term basis:

“the results do suggest that CDC plans appear to require a continuing stream of member contributions to ensure 100% sustainability over time and to allow risk sharing to operate between members..”

The GAD points out that:

“It would be very difficult to contain risk levels for schemes that had very small numbers of new entrants. When there are few or no new members there is a higher probability of a scheme failing and leaving some members without any pension or facing significant cuts being made to younger members’ pensions.”

Stability of CDC plans — what might be different now?

We agree that this issue needs to be addressed. The Dutch solution (see Section 7) involves fewer but larger plans than we typically have seen in the UK. These larger plans would have a longer life than a single employer’s plan. Even if an individual CDC plan is closed, it could be absorbed into larger, continuing CDC plans.

However this solution does not address the structural issue that individual plans may become closed at a time when they are particularly mature, and when reducing their pension benefits would be a major change. In our view, the public exposure of investment, bonus and risk management policies via the CDCPW would force a plan which had closed to new entrants, and which was becoming increasingly mature, to adjust its financing policy to protect the face value of members’ benefits ie, no reduction in core benefits.

The GAD modelling cited above looks at a CDC plan which runs off with no new entrants — and which failed (ran out of assets) in 40% of scenarios. But this is unsurprising, because their plan was invested 50% in equities, yet bought out flat annuities at retirement and incremental tranches to cover increases in payment. By the time there are only a few cohorts of non-pensioners remaining, there is a huge geared mismatch between assets and liabilities, which cannot be absorbed by other generations. In order to avoid these problems, our approach would be to allow the CDC plan to de-risk its investment strategy progressively into matching assets as the population ran off.

Shrinking population means declining plans?

Morgan¹⁹ suggests that the shrinking UK population is likely to place increasing strain on CDC plans and accentuate the issues of declining CDC plans above: *“as the number of members reduces due to a shrinking population, smoothing of returns and longevity risk is likely to result in a disproportionate amount of the costs being borne by the young.”* We are not convinced of the shrinking population point. ONS statistics²⁶ state; *“The UK population is projected to increase by 4.9 million to 67.2 million over the ten year period to 2020. This increase is equivalent to an average annual rate of growth of 0.8 per cent.”* The working population may not be growing as fast — but this will impact on all holders of financial instruments — whether they are under conventional DC schemes or CDC plans.

The trustees of CDC plans would have access to projections of their changing membership, and could respond appropriately to demographic trends, where conventional DC members have no realistic choices. For example, in our suggested CDC framework the age from which benefits are payable would not be fixed, but would be re-assessed on a regular basis to keep pace with changes in longevity (see Appendix C). This would relieve some of the financial pressure from population ageing and ensure that inter-generational changes are borne more fairly.

Legal implications – 2008 concerns

How and where do CDC plans fit into European pension legislation? The DWP ask questions such as:

“We considered whether CDC plans could fit into the definition of money purchase plans and thus be compliant with European legislation in a similar way to DC plans where assets always meet liabilities.”

They point out some difficulties:

“A complexity with this lies in the practicality of assessing the financial commitments of a plan which could reduce its liabilities if assets fall in value. It is not clear how the extent of such liabilities could be assessed and how to determine funding requirements.”

The DWP noted that another EU country – the Netherlands – has found ways to make CDC plans work, but seem to conclude they are fundamentally different to what we would want to offer in the UK. More interestingly, leading pensions lawyers back in 2008 had already arrived at alternative conclusions. Slaughter and May partner Philip Bennett said that Collective DC plans would not breach the Directive of Institutions for Occupational Retirement Provision if they were correctly designed. It seems that more effort could have been applied here.

Legal implications – what might be different now?

The UK has increasingly adopted a more confrontational approach to Europe – or rather has been more prepared to challenge European rulings as they apply to UK pension plans. The spirited challenge of UK plans to the adoption of Solvency II would be a classic example of this new-found enthusiasm not to accept blindly Euro initiatives.

Other European countries – notably the Netherlands – have found ways to accommodate European legislation for their CDC plans. In fact, Dutch plans have made substantial changes which from a UK perspective would appear to contravene basic European principles – changing past benefits from DB to CDC benefits. Against this background, we believe that the UK government should be totally prepared to ensure that European legislation does not de-rail the introduction of a UK version of CDC plans.

Potential demand for CDC plans — 2008 concerns

The DWP carried out a small-scale survey among employers.

“In the small-scale qualitative research investigating employer attitudes to CDC plans, it transpired that employers were sceptical of the potential for higher returns (due to administration costs and scepticism about the performance of financial markets) and of the greater predictability of CDC plan pension outcomes (as pensions are not guaranteed).”

We suspect there is something here around the framing of this question. Suppose we were to ask employers the following question: *“Would you be interested in a type of pension that, at the same cost, is expected to give your employees one third more than your current DC plan, greater stability and predictability, but was guaranteed not to involve you in any DB liability?”*

Why would anybody not be in favour? The DWP did note that enthusiasm was higher among existing DC plans, rather than DB plans: *“Employers with contract-based DC schemes who would like to deliver a better pension to their employees might consider CDC schemes, especially if CDC schemes became the expected norm in their industry.”*

If employers are to be consulted on their attitudes towards potential CDC plans, we believe that the potential advantages identified in our research and elsewhere (eg, the RSA analysis¹⁷) should be placed firmly as a backdrop to any questioning.

Potential demand for CDC plans — what might be different now?

At the Aon Pensions Conferences in 2013, delegates (typically pension professionals) were asked about the government’s proposed activities under the Defined Ambition headings of DB Lite, DC Plus and CDC. Only 21% of the 757 responses said they felt the current pension system was fit for purpose and that they were satisfied with existing DC and DB plans. Support for the DB Lite proposals was relatively modest at 14%, suggesting that most sponsors and plans feel the future of pensions will have little or no DB exposure. However, there was widespread support for looking to improve the outcomes from DC plans, with 34% in favour of the DC Plus work-strand, and 32% in favour of CDC solutions. As we commented in our press release announcing these findings: *“It seems clear that the industry believes that we could — and should — try harder to deliver better outcomes for our DC members. The broad support for CDC solutions was even more encouraging, and significantly more favourable than the generally negative stories one sees about these approaches.”*²⁷

We have also discussed the CDC concept with several of our larger clients (typically FTSE 100 companies) and have found an encouraging degree of interest in the idea of collective plans, and the associated benefits, despite the acknowledged issues.

2008 conclusions

Given the DWP analysis of the issue, one could have been forgiven for expecting the exact opposite conclusion to the one they gave — why not support CDC plans, with their potential for higher, more stable member pensions? The stated objections are discussed above — but in our view there was another, unstated item which may have influenced the thinking at the time — the potential for accusations of mis-selling. We have acknowledged throughout this paper that there are real challenges in communication of CDC plans and the “soft guarantee” nature of the benefits. In particular the nature of the guarantees that members can expect (ie, there are none!) and the potential for reducing “granny’s” pension. We wonder whether the government’s reluctance to support CDC plans is that it has been criticised for issuing misleading announcements regarding the level of guarantees in final salary plans and doesn’t want to run the risk of being accused of mis-selling CDC plans.

The mis-selling of defined benefit plans?

In 2008 the Appeal Court upheld a verdict that government mal-administration played a role in tens of thousands of workers losing their pensions²⁸. The previous year the High Court had ruled that government leaflets helped mislead up to 125,000 people whose pension schemes went bust between 1997 and 2005. Campaigners such as Ros Altmann pointed out:

Successive Governments actively encouraged people to join occupational pension schemes and promoted the benefits of these, without ever mentioning the risks. Scheme booklets were allowed to use words like “guaranteed” and “promise” and were not required to mention the risk that pensions might not be paid.

Since Government promoted and encouraged occupational scheme membership (even allowing employers to make joining the company scheme a condition of employment) it was reasonable for members to assume that the benefits “promised” were secure.

Official advice was that occupational schemes give a known amount of pension, in contrast to private pensions, which depend on investment performance and annuities to provide a particular level of pension. In practice, this is not true and many members would have been better off in personal pension schemes, if they had realised the risks.

The setting up of the Financial Assistance Scheme to help these employees — and the Pension Protection Fund for future generations of DB members — represented a significant cost and distraction for the government. They would naturally be wary of embarking on another venture (CDC) that had the potential to be misunderstood, and where disaffected members in years to come might seek to blame the government for endorsing and encouraging these plans.

The political will and demand for CDC

There is no doubt that the political will to consider a solution such as CDC is now present, in a way that it was patently not in 2008. The Pension Minister, Steve Webb, had stated that CDC would “feature prominently” in his upcoming defined ambition paper²⁹ and this has been followed through in the latest research². We can ask the question why he is so enthusiastic, where previous ministers have been more reluctant (in spite of the evidence for improved performance)? Our view is that it has become progressively clear that DC schemes are not the ultimate solution to pension provision for private sector employees in the UK and that some type of innovation is needed. Whether that innovation comes in the form of CDC plans, or improvements or additions to DC schemes is a moot point — but CDC is definitely under political consideration.

With-profits

The comparison with with-profits funds is a fair challenge, since the smoothing concepts behind our version of CDC plans have strong similarities with the operation of with-profits funds. We do believe that the debate has moved on substantially since the issues surrounding Equitable Life and the decline of this once leading with-profits life office, and that many of the reasons that commentators would cite as to why with-profits is discredited can be addressed directly and fully in the operation of CDC plans.

- **Clarity on the nature of the benefit.** With-profits policies typically had a mixture of guaranteed benefits and discretionary benefits (bonuses) on top. The separation of these two could be confused and in some cases required High Court clarification. Our CDC plans would operate without any underlying guarantees, and this would be made clear in all communications to members.
- **Changing expectations.** Many with-profits policies operated at times of very high bonus declarations, on the back of strong equity markets during the 1980's and 1990's. As market conditions changed, and returns became more modest, there was a commercial reluctance to reduce the projected benefits illustrated to members, and final outcomes often fell short of (arguably over inflated) expectations. Communication of our CDC plans would be subject to regulatory oversight and public scrutiny to ensure that expectations of outcomes are realistically presented.
- **Transparency.** The financial operation of most with-profits life office funds was an opaque process — there was little opportunity for advisers and commentators to establish the credibility of bonus declarations and the connection back to the assets supporting the with-profits funds. In the absence of public disclosure, challenging the life offices was extremely difficult for external observers. Under our model, there would be complete transparency of operation of CDC plans, via the CDC Public Website. Challenge would not be something that a CDC plan operation could resist — transparency would be part of the essential fabric of a CDC plan.

7. CDC around the world

Learnings

It is not the place of this paper to conduct an extensive review of the operation of CDC plans around the world. We have however considered a limited number of instances of CDC — or more broadly risk-sharing plans — to identify some lessons and experiences that can be taken on board in helping to frame the implementation of CDC plans in the UK.

The Netherlands

The Netherlands is the country most commonly quoted as having the most developed Collective DC system. CDC plans have become increasingly popular in recent years as employers have moved away from defined benefit plans for reasons similar to those in the UK. In many cases, past benefit obligations have in effect been converted from defined benefit to CDC benefits.

The Dutch system is characterised by two things which differentiate it from the UK (DC) system. The first of these is the level of contributions — typically around 20% of pay compared to the much more modest UK levels. The Dutch like to think of working Friday for their retirement savings. The second characteristic is that the Dutch have a smaller number of large pension plans. The Dutch pension regulator has been active in seeking to reduce the number of schemes in their country from over 3,000 to around 500. Clearly from a regulatory perspective any pension regulator would rather have a smaller number of well-run schemes than a large number of potentially problematic schemes.

A good overview of the Dutch system is set out in Van Rooij et al (2007)³⁰ and Ponds and Riel (2009)³¹.

New Brunswick

What is perhaps less well known is that certain Canadian provinces have made strides towards Defined Ambition, risk sharing plans³². The Province of New Brunswick³³ adopted this approach as part of its reform of public sector pensions, which was prompted by some familiar global issues — unpredictable investment revenue, low interest rates affecting fixed-incomes, and increasing costs due to longer retirement periods. The New Brunswick (NB) system has garnered considerable attention and interest for its capacity to make pensions more secure, transparent, sustainable, reliable, affordable and predictable, and is being considered by other Canadian provinces.

Features

Although the central rationale of the NB reforms is that they share risks between employers and employees, there are a number of features that we feel can be adopted into UK CDC thinking including:

- Pension plans must be subject to robust risk management, and be checked annually, including stress tests.
- Risk management targets are focused on delivering a high degree of pension security for members and retirees.
- A pension plan should be able to demonstrate that it will be sustainable over the long term.
- The plan must be equitably designed – no single age cohort should unduly subsidise another, and no one should be able to “game the system”.
- The plan must be transparent. The pension goals and risks must be clearly stated up-front; who shares in the risks and rewards and by how much must be clear and pre-established.
- There should be no sudden shocks to members’ and retirees’ retirement plans.

New Brunswick stress testing

- “Stress-testing” in the context of the risk management protocols means using 20,000 computer simulations, and demonstrating there is a high probability of delivering sustainable benefits under adverse financial and economic circumstances.
- The model was designed to prevent any reduction in the base benefits in a minimum 97.5% of scenarios and to provide enhanced benefits such as cost-of-living increases which on average over all scenarios produce at least 75% of the desired indexing. Even in the remaining 2.5% of scenarios, representing the most severe economic depressions, the decreases to the base benefits would be temporary and tightly managed.

8. Modelling CDC outcomes

Modelling

We have developed some sophisticated modelling tools to enable us to gain insights into the potential behaviour of CDC plans, and how they compare with conventional DC schemes. Specifically we have modelled:

- the historic behaviour of an illustrative CDC plan compared with DC schemes over the period from 1930 to 2012; and
- the plans' prospective future behaviour over the period 2013 to 2062, using stochastic methods to illustrate outcomes under a range of possible economic scenarios.

The results of our modelling are framed in terms of members' income replacement ratios (that is, their pension as a proportion of final pay at retirement). This allows for a greater level of comparability between members retiring in different years.

Comparisons

- We contrast the pension outcomes for members in the sample CDC plan with those that they would be expected to receive under a conventional Defined Contribution ("DC") pension arrangement.
- Appendix A contains a description of the conventional DC schemes we have modelled. A key feature of these DC schemes is that they are well governed and low cost DC scheme — we are not giving our CDC plans any inherent advantages in terms of extra investment returns or lower costs (although we note in passing that many current DC schemes fall well short of these ideals). Appendix B sets out the CDC plan design, which is in line with that described earlier and targets a 1% CARE pension. Both arrangements cost the employer the same — 10% of pay.
- As noted earlier, a wide variety of CDC plan designs is possible and we have focussed on just one for the modelling in this paper. Other variations of CDC plan design could behave differently and offer different member outcomes to the sample CDC plan we have chosen.

Appendix E sets out the key methodology and assumptions that lie behind our modelling.

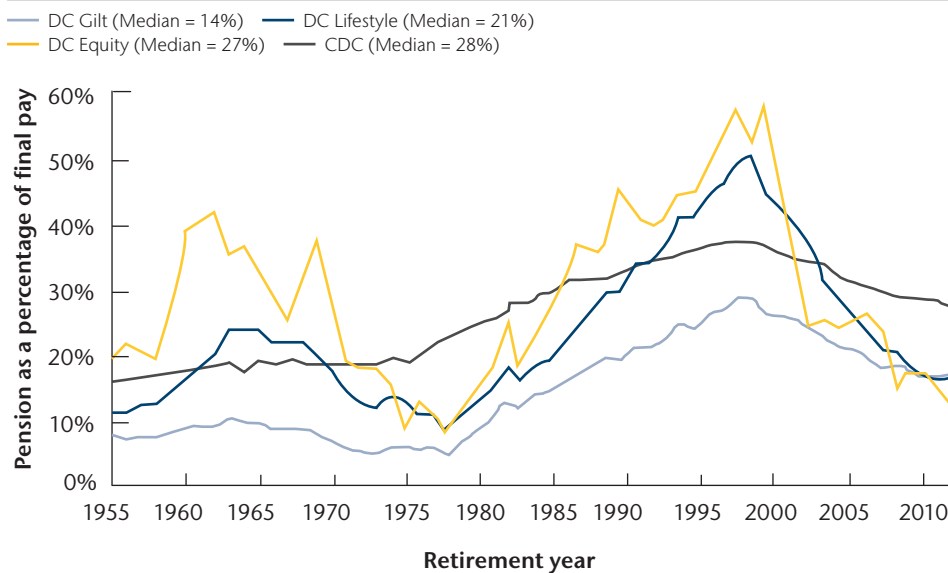
Past performance

Chart 4 shows the income replacement ratio (pension / final pay) which would have been achieved by a member after contributing 10% of pay each year for 25 years to either a DC scheme or our selected CDC plan. In effect this takes Chart 1 and shows the comparison with the CDC plan outcomes. As in Chart 1, three types of DC investment are illustrated: equities (gold), gilts (light blue) and lifestyle (dark blue) – compared with the CDC plan outcome (grey).

In each DC scenario, the member is assumed to purchase a CPI-linked annuity at retirement using their accumulated fund. Under the CDC plan, the member would continue to receive annual adjustments to their pension in the same fashion as active members of the CDC plan.

In order to illustrate a fair comparison with the DC schemes, we have taken the average pension received during retirement for the CDC plan pensioner (expressed in real terms relative to their retirement date). For example, if the pensioner in the CDC plan experienced a revaluation of CPI + 2% just after retirement and revaluations in line with CPI thereafter, then the average retirement pension shown below would be their initial retirement pension uplifted by 2%.

Chart 4 – Historic CDC and DC outcomes



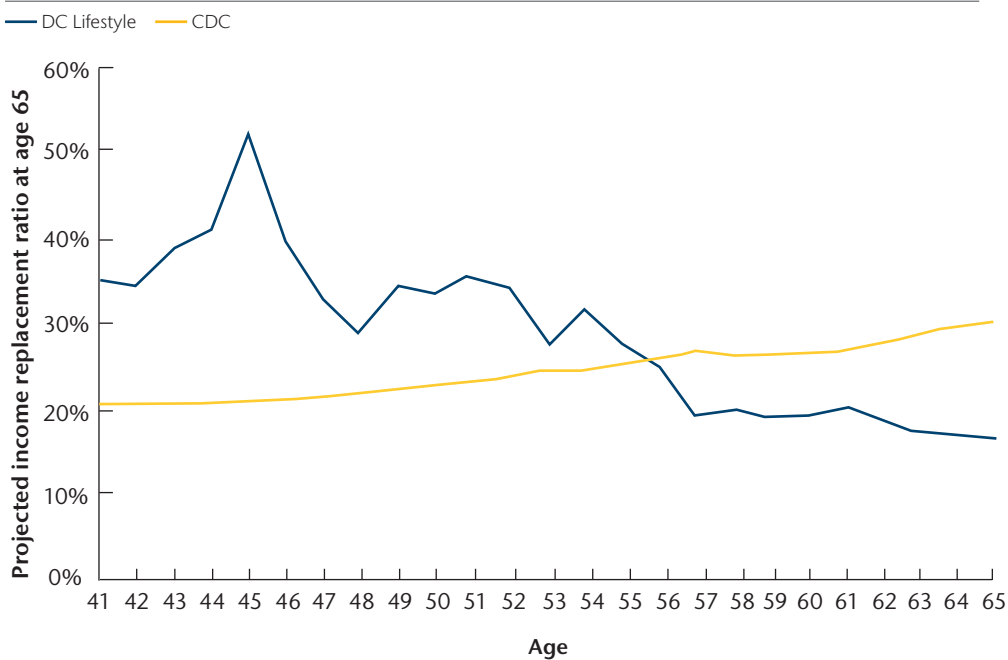
Observation on historic outcomes

- The average pension from the CDC plan is bigger than the average pension from all three DC schemes. On average over this time period, it is broadly double that from the gilts-based DC scheme, one third higher than DC lifestyle and comparable with the equity-based DC scheme.
- Simply by inspection of Chart 4, it appears that the CDC plan gives smoother outcomes for members. For example look how the pensions for the DC lifestyle plan change so dramatically from the start of 2000 as equity markets collapsed (repeatedly!) and interest rates (which drive annuity prices) continue their secular drops to all time lows.
- Therefore, from a historic perspective, the CDC plan offers higher, more stable pensions.

Stability of historic outcomes

- Members will want to know what pension they can expect from their savings – especially as they approach retirement. The greater smoothness of the CDC plan hinted at in Chart 4 is therefore a desirable feature.
- Chart 5 below considers this in more detail. It looks at the way in which the projected pension at age 65 varies over time for an individual member retiring in 2011. Again, we consider the projected pension as a percentage of projected final pay, rather than in absolute terms.
- In a DC scheme at present, a member would receive an annual SMPI statement, and may also have access to some form of modelling and projection tools made available to plan members. As each year passes, the projections will reflect changes in the market value of the DC account held, and also prospective changes in annuity rates, when the account is converted into pension. The pension illustrated at age 65 can vary significantly from one year to the next, making retirement planning more difficult.
- Appendix E gives the full technical detail on how the projections for the DC schemes and the CDC plan are made.

Chart 5 – Variability of projected pension for 2011 retirements



Observations

Chart 5 shows how hard it can be for a DC member to plan for retirement. Early in his career our DC member might be planning on a pension of half his pay – the eventual figure turns out to be rather less than one fifth of pay – a significant difference that would need to be corrected by increasing contributions and / or deferring the chosen date of retirement.

The CDC pension only varies between 20% and 30% of pay and avoids large swings from year to year.

Our CDC member has a smoother journey towards the eventual pension, without having to invest heavily in “low-risk” asset classes such as bonds which would offer lower growth prospects. As demonstrated by Chart 4, this approach also means that the benefits members receive under CDC are more similar between generations (ie, there are inter-generational cross-subsidies).

CDC benefit adjustments

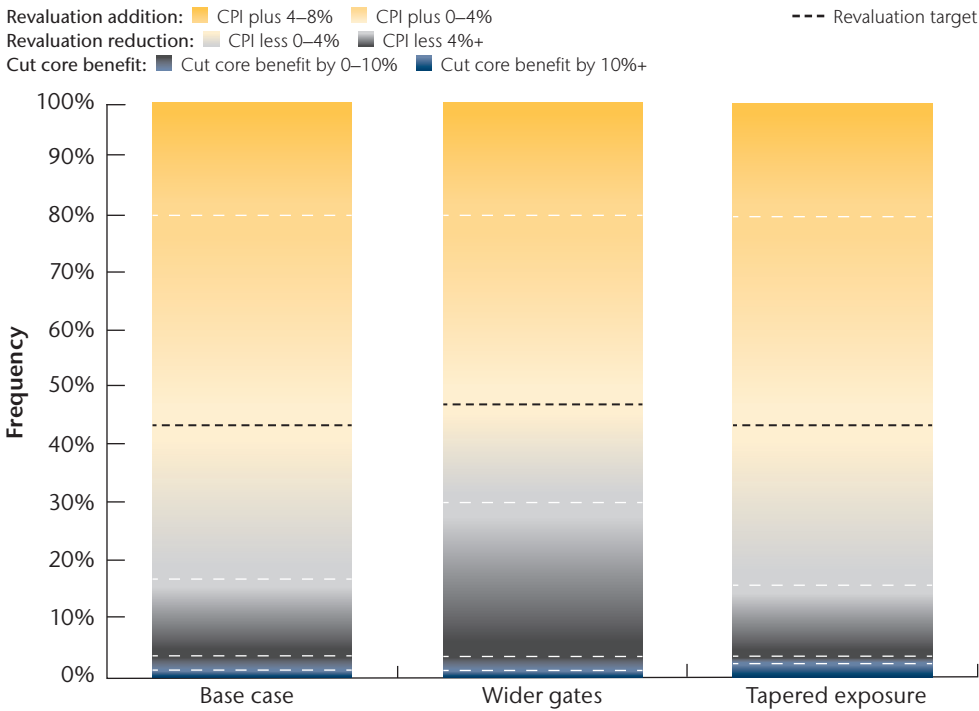
We have analysed the adjustments that would have been made to the CDC benefits over the course of members’ participation in the plan. The intention is that each year an adjustment is made in line with the increase in inflation (measured by the Consumer Prices Index, or a proxy for it). If the plan has a funding level in excess of 110% then additional increases may be awarded. Conversely if the funding level falls below 90% then a lower increase may be granted and in extreme conditions benefit cuts may need to be applied.

Chart 6 summarises the historic pattern of benefit changes for

- Our “base” design (left-hand bar)
- Two designs with alternative “control mechanisms” (that is, rules for benefit adjustment).
 - The first of these has wider and asymmetric funding “gates” – no adjustment to benefits is made if the funding level is between 85% and 125%.
 - The second variation looks at offering greater protection for older members, who are progressively phased out of the risk of benefit cuts from ages 65 to 75. This means that after age 75 they are receiving a protected pension, subject to the plan revaluations each year but shielded from any benefit cuts in periods of poor performance.

Remember that the inflationary revaluation awarded under each design is subject to an annual minimum of zero. For example, if the CPI increase for the year is 2%, then a revaluation of “CPI less 4%” means awarding a revaluation of 0% (not -2%).

Chart 6 — Historic adjustment to benefits



Observations

- For all three designs, the revaluation part of the control mechanism is sufficient to keep plan funding on track in about 96% of cases (without resorting to any core benefit cuts).
- The design with the 85% – 125% funding gate reacts more slowly to both good and bad performance.

This means

- There are fewer and smaller benefit cuts, but...
- ... the revaluation control mechanism is less generous more of the time (for example, there are around twice as many years with a revaluation target of CPI less 4%+ compared with the base design). This is because the plan funding level has to improve by 40% (from 85% to 125%) in order to restore the revaluation target once it has fallen initially. This compares with a movement of just 20% in the base design.
- The plan’s funding level is more volatile than in the base design (ie, the plan is allowed to carry a larger surplus or deficit before any correction is imposed by way of benefit adjustment).
- Members’ income replacement ratios in retirement are (slightly) more uncertain, and less smooth between generations. This is because the revaluation target is more “sticky” and less inclined to average out over a member’s time in the plan.

Observations (continued)

The last two points are not in themselves evident from Chart 6, but are supported by the more detailed analysis we have performed on these design sensitivities (which is set out in Appendix D).

- The design with tapered exposure to benefit cuts behaves broadly the same as the base design except where a cut is actually required.
 - This means the chance of benefit cuts being imposed is unchanged (around 4% for the past history modelled), but...
 - ... when cuts are required, they apply only to the younger members (and are larger as a consequence).
 - Even for a mature CDC plan like the one we have modelled, the risk of substantial benefit cuts for younger members remains relatively small (2 years out of 82 with a benefit cut greater than 10%). Clearly this is a matter of perspective — but it does illustrate that some protection of older members can be viable in principle.
 - Again, members' income replacement ratios in retirement are more uncertain overall with this design than with the base design, because there is less risk sharing between members and so reduced “smoothing” of outcomes for each individual.

This last point is not evident from Chart 6, but can be seen from the more detailed modelling set out in Appendix D.

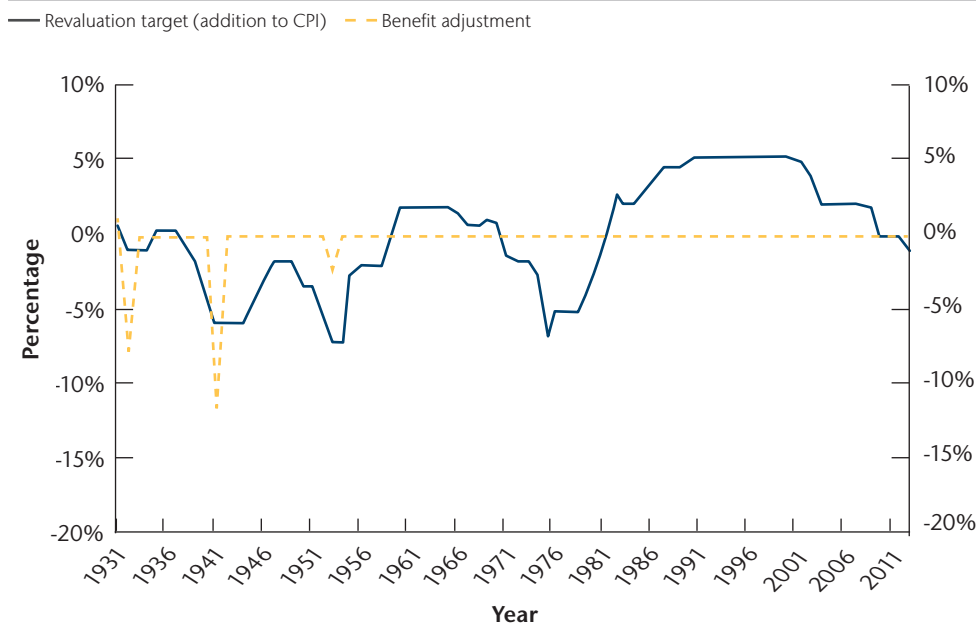
Alternative Illustration

Moving back to the base design, the scale and frequency of benefit adjustments is further illustrated in Charts 7 and 8. These show (respectively):

- The benefit addition to / deduction from CPI and, separately, the extent of any benefit cut each year during the period.
- The combined effect of these factors each year (in terms of the overall adjustment applied to accrued benefits).

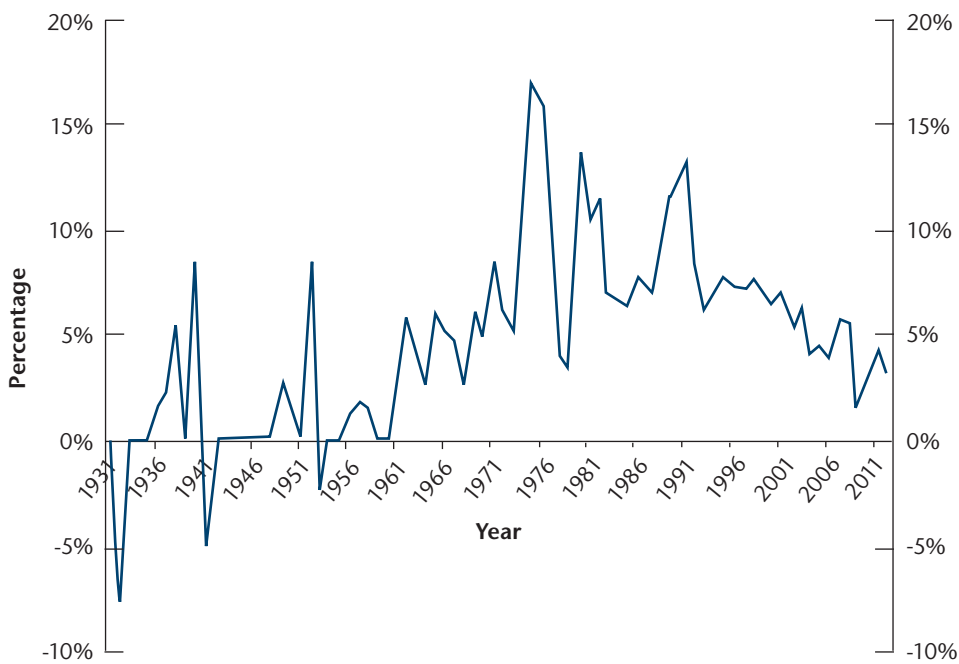
For example in 1995, the increase awarded would have been 7.5% – which was a 5% bonus on top of CPI for that year of 2.5%.*

Chart 7 – Historic adjustment to benefits over time



* Of course the astute reader will know that the CPI was only introduced from 1996. Our historic modelling uses the increase in RPI less 0.8% as a proxy for the notional increase in CPI each year. This is based on the average difference between CPI and RPI increases for the period where both have been published. Appendix E sets out further details on the methodology and extrapolation of historic data.

Chart 8 — Combined effect of historic adjustment to benefits over time



Observations

- The overall pattern of increases looks consistent with what one would expect. In the late 1980s and 1990s, against a background of roaring equity markets and reasonable levels of real interest rates, bonuses were regularly awarded in excess of the anticipated rates. This positioning changes as conditions deteriorated in the aftermath of the dot com bust, and as interest rates continue their secular declines.
- In 96% of years no reduction to base benefits would have applied.
- The 3 reductions to base benefits which would have applied were 8% (in 1932), 12% (in 1941) and 2% (in 1953).
- So even in the shadow of global economic turbulence, with the Great Depression in the early 1930s and the Second World War in the early 1940s, benefit reductions were rare and limited to around 10%.

Future projections

To obtain a better feel for the behaviour of our CDC plan in different economic circumstances (other than those actually experienced over the past 80 years), we have also tested our illustrative design over a distribution of possible future economic scenarios.

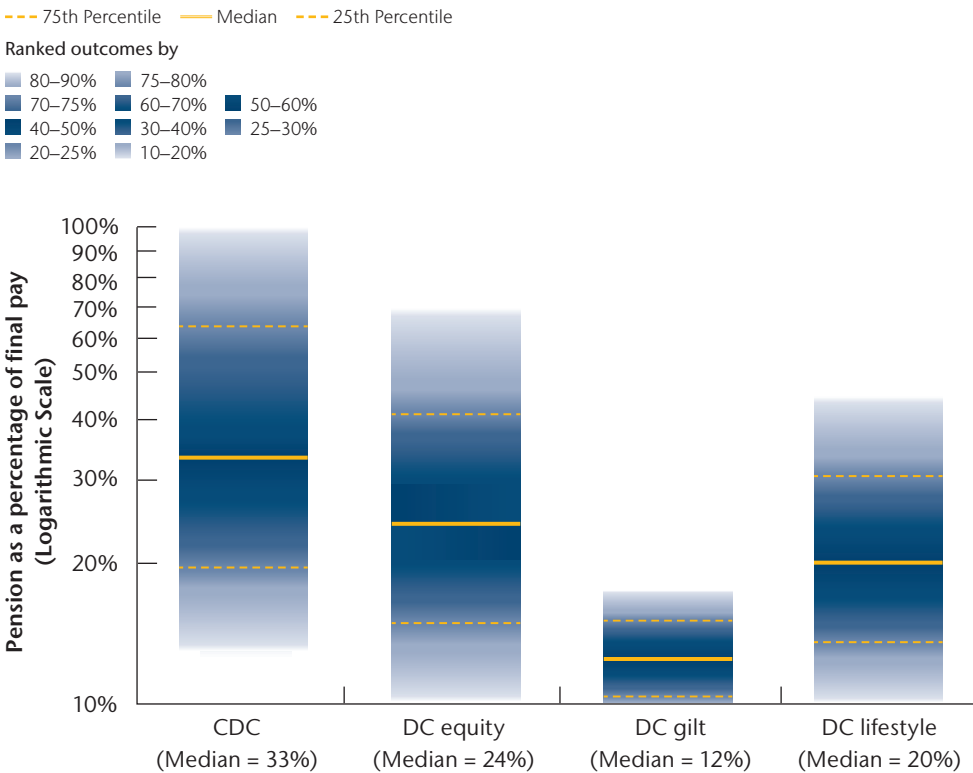
We have looked at an “existing” scheme that starts with a mature steady state membership at today’s date, and also starts life fully funded. We then project a large number of future simulations (around 450) between 2013 and 2062, encompassing a wide range of economic scenarios, asset returns and other financial conditions.

As in our past analysis we look at the income replacement ratio for members retiring over a range of years (this time 2037 to 2046) after contributing 10% of their pay to the plan for 25 years. However, we are no longer just looking at the distribution of member outcomes over time – instead we are looking at the distribution of member outcomes across all 10 years of all 450 scenarios (ie, 4,500 outcomes altogether).

As previously noted, under the CDC plan, the member would continue to receive annual adjustments to their pension when it is payment (in the same fashion as active and deferred members). We have therefore used their average pension in retirement (expressed in real terms relative to the retirement date) as a measure of outcome consistent with the DC schemes.

For each plan design, we have shown in Chart 9 the “average” (median) of the 4,500 outcomes as the heavy black line. The potential range of outcomes is illustrated by the coloured areas which incorporate every tenth percentile of the distributions (up to the 10% and 90% percentiles).

Chart 9 – Summary of projected outcomes (for retirements 2037 to 2046)



Observation

- The median projected pension for the CDC plan is higher than for all three DC scenarios: one third higher than DC Equity; two thirds higher than DC Lifestyle and over double the outcome from the DC Gilt plan.
- The distribution of outcomes for the CDC pension is broadly similar to those under the DC Equity scheme — in fact the modelling shows a slightly wider distribution. This is essentially because the CDC plan has a higher exposure to equities (which are inherently more uncertain) than the DC schemes over the course of the member's participation.
- However, if we look at the distribution of the outcomes broken into deciles, we find that the CDC outcomes are consistently higher at every decile than the DC outcomes. So the distribution of ultimate outcomes may be wider for the CDC plan than its DC comparators — but the unpredictable element is just how much better it will be than the corresponding DC scheme!
- Furthermore, the CDC plan delivers a smoother ride to members as they accrue benefits in the plan (in spite of the greater exposure to equities). We can see this by delving a little deeper into the results in the chart that follows.

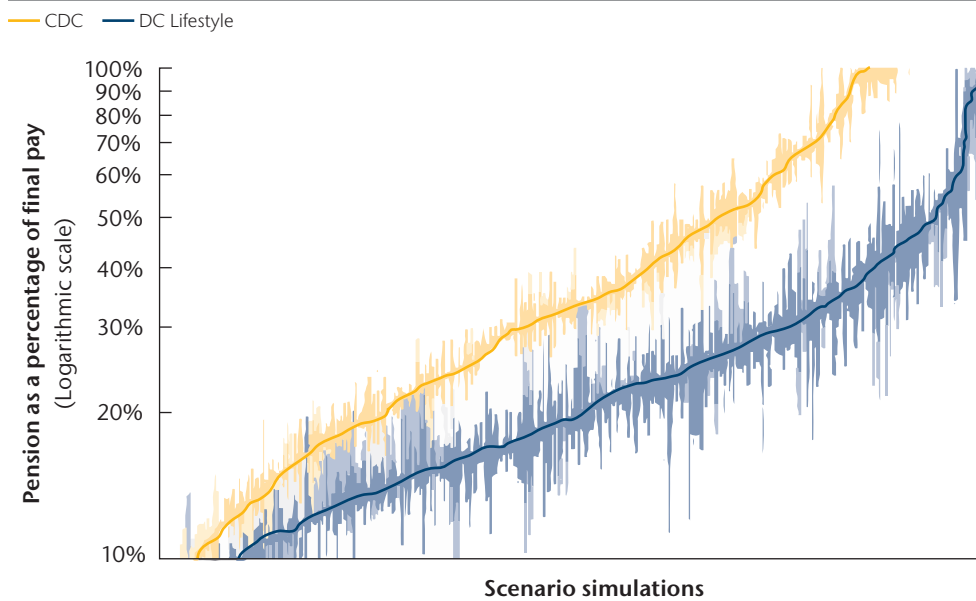
Further detail

Chart 10 again looks at the distribution of outcomes for members retiring in the 10-year window 2037 – 2046 after contributing 10% of their pay to the plan for 25 years. But this time we have split the overall distribution down into the range of outcomes for each simulation scenario.

- For each of the simulated scenarios (horizontal axis) we have plotted the spread of pension outcomes at retirement (vertical axis) for members retiring in years 2037 to 2046 inclusive. The heavy line represents the median outcome in each scenario, and the fainter lines depict the 5%, 25%, 75% and 95% percentiles of the outcomes for that scenario.
- The simulated scenarios have been plotted in order of ascending median outcome for visual clarity. (Note that this order has been determined separately for CDC and DC Lifestyle, so the points will not necessarily correspond scenario-by-scenario along the horizontal axis.)

We have again analysed all three DC flavours, but the chart below focuses on just DC Lifestyle to avoid becoming cluttered.

Chart 10 — Detail of projected outcomes (for retirements 2037 to 2046)



Observations

- The median outcome for CDC is higher than for DC Lifestyle across the simulations (not just on average).
- The chart also shows that improved outcome stability is a persistent feature under CDC, which exhibits a much narrower range of outcomes over the 10-year window than DC Lifestyle for the vast majority of scenarios modelled. This means that outcomes are smoother and more even between successive generations of members.

Stability of prospective outcomes

Just like for the past history (Chart 5) we can also look at the stability of accruing benefits from an individual member's perspective as they approach retirement.

Chart 11 below

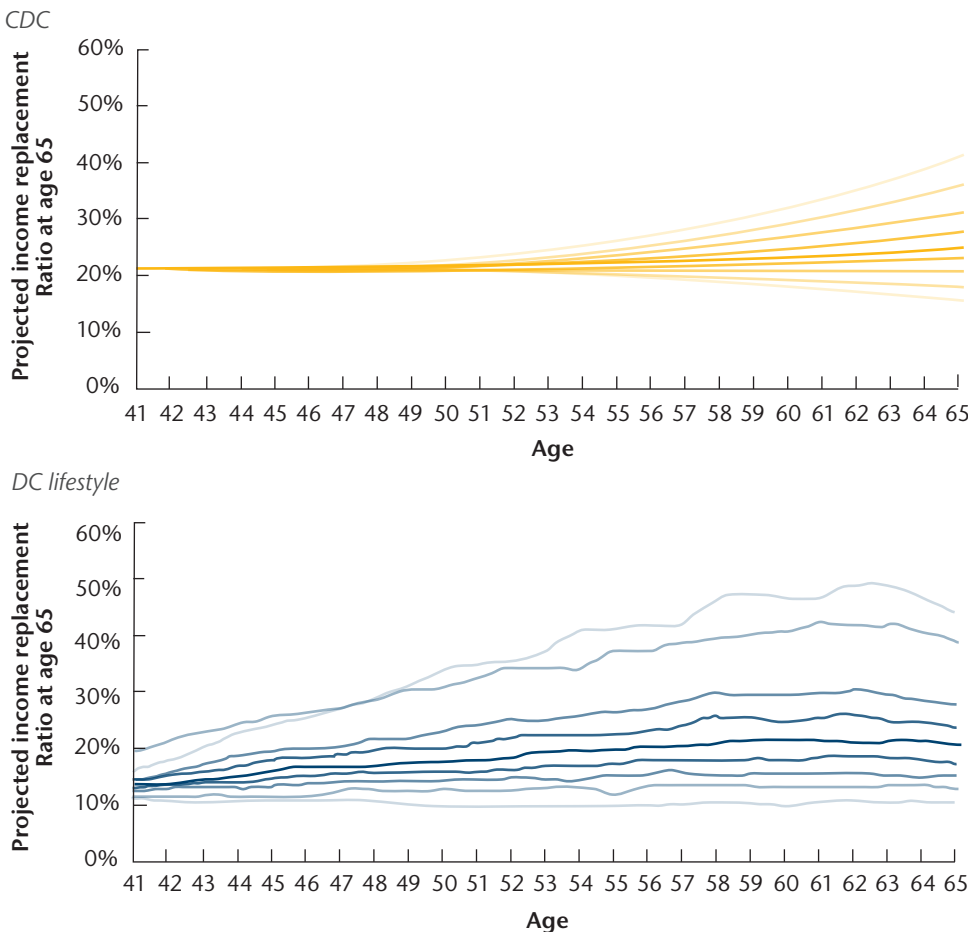
- looks at a sample member (this time retiring at age 65 in 2037 after contributing 10% of their pay each year for 25 years);
- shows the member's projected income replacement ratio (pension / final pay) at retirement, as they approach age 65.

The heavy line on each chart represents the median projected income replacement ratio and the fainter lines depict every tenth percentile of the distribution (up to the 10% and 90% percentiles).

So for example:

- In the CDC plan our member would initially expect an average pension of just over 20% of final pay during retirement. By the time they actually retire, this expectation may have changed to somewhere between 15% and 40% (in the central 80% of scenarios) with a median outcome of 25%, depending on financial conditions over the intervening period.
- In the DC Lifestyle scheme our member would initially expect a pension of just under 15% of final pay during retirement. Over the course of their contributing service, this expectation may have varied anywhere between 10% and 50% (in the central 80% of scenarios) with a median outcome just over 20%.
- So the range of variation is wider than under CDC, and the median outcome is lower.

Chart 11 — Variability of Projected Income Replacement Ratios



Observations

This chart shows that a CDC plan would deliver a more stable pension expectation than a typical DC Lifestyle arrangement.

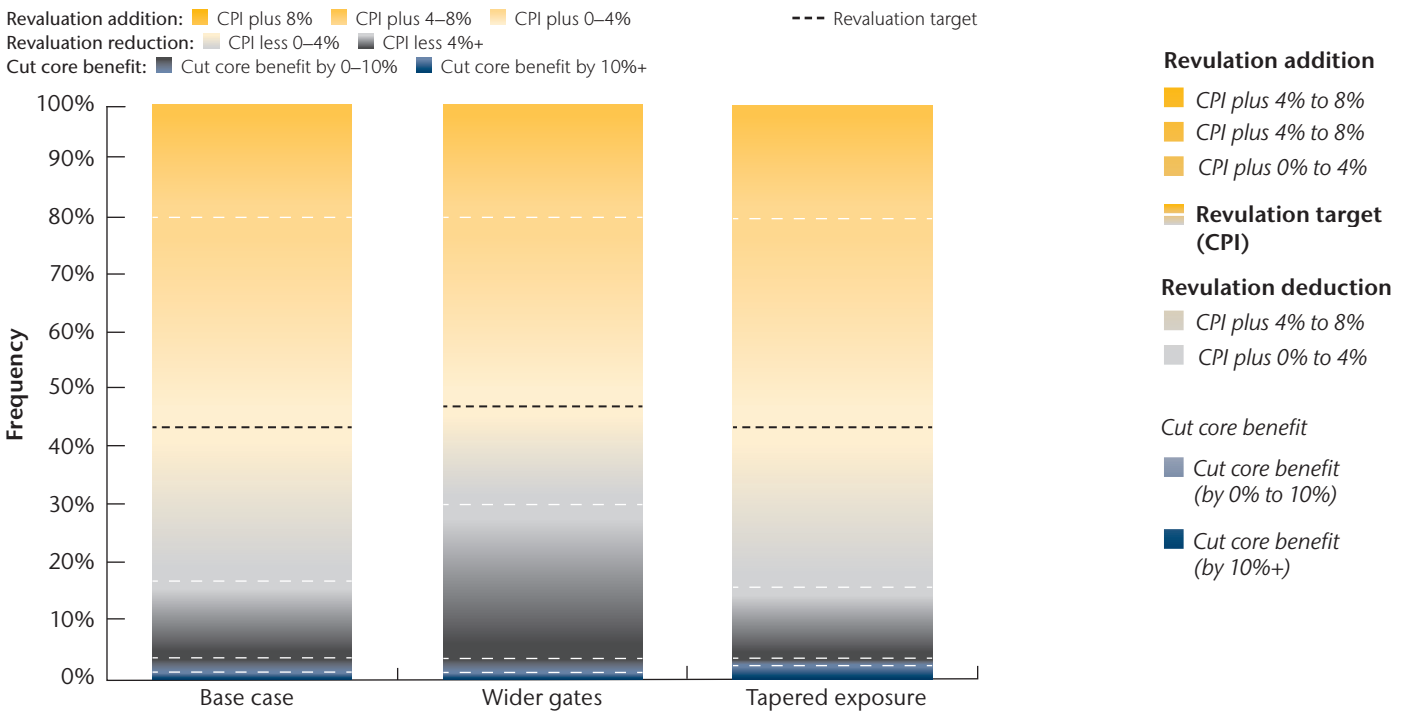
So as members save each year they see their estimated income replacement ratio at retirement (allowing for future contributions and future expected investment returns) vary by very little year on year, something that is significantly lacking in today's DC schemes. And they can achieve this without having to invest heavily in "low-risk" asset classes such as bonds which would offer lower growth prospects.

Prospective benefit adjustments

We acknowledge that Chart 11 only considers the position pre retirement and that CDC plans are more uncertain post retirement than DC schemes. So in Chart 12, we have also repeated the analysis illustrated earlier about benefit adjustments, but based on the prospective economic scenarios. The conclusions mirror those of Chart 6, but looking at prospective future outcomes, and are as one would expect. You can see in the base case that 70% of the scenarios deliver higher than the target benefits, so the post retirement CDC plan is more uncertain but on average it increases the additional benefits compared with the DC scheme.

We have again illustrated three potential variations of our CDC plan – the base case model (with control gates at 90% and 110% funding), the wider gates of 85% and 125% and the tapering protection for older members.

Chart 12 — Prospective adjustment to benefits



Observations

The analysis of future projections shows that under the base design:

- in around 95% of years no reduction is applied
- in around 3% of years a reduction is applied of between 0% and 10%
- in around 2% of years a reduction is applied of more than 10%

If we look (Appendix D) at our scheme with age tapering to offer greater protection for older pensioners, then in none of the projections do the pensioners over age 75 suffer a benefit cut — in 29% of cases pensions are not fully increased in line with inflation. The consequence of this greater protection for older members is that younger members are more likely to suffer a larger benefit reduction. The figures of 95%, 3% and 2% above would move to 95%, 2% and 3%. That is, the overall likelihood of benefit cuts is unchanged, but the magnitude of any cuts would be higher. Having said that, one could argue that the extra risk looks reasonable compared with the additional security for pensioners.

The potential for benefit reductions in a CDC framework would of course require careful communication and management.

However, we need to remember that:

- The security of members’ pensions in a conventional DC arrangement is no better than CDC overall (it is just that the volatility is concentrated pre-retirement and at the point of annuity purchase). One could argue that sharing the volatility between employees and pensioners is more equitable.
- It appears viable to use a design structure where the exposure to potential reductions is tapered by age and hence lower for pensioners in payment (as above). It should be possible to refine this design further so as to optimise inter-generational fairness (using a symmetrical exposure to greater upside performance for younger members).
- The CDC design can be formulated so that any reductions are restored as a priority before increasing the target revaluation rate going forward. This makes it more likely that reductions will be temporary and members’ benefits will be more stable in the long run.

9. Conclusions

Modelling conclusions

By sharing risk between members we achieve higher, more stable pension outcomes for members, than by using an individual DC pension arrangement.

In addition, the implementation of a collective arrangement may offer scope for further savings or enhanced outcomes compared with an individual product (for example, reduced administration overheads, or higher investment returns). We have not analysed such savings in this paper, but it is worth noting here.

“The best is the enemy of the good”

Voltaire

Collective DC may not be the perfect pensions system — but there again, most other pensions systems have been shown to have significant flaws. It has always been relatively easy to criticise CDC and to spot potential flaws. But CDC has many powerful, good aspects that should improve retirement outcomes for many UK workers — collective investment by professionals not members, benefits expressed in income terms not capital accounts, not having to buy an annuity at poor times in the market to name but a few. CDC deserves a chance to demonstrate how it can deliver better member outcomes and this paper sets out our (balanced) reasons for coming to that conclusion — warts and all.

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Appendix A – Illustrative DC Scheme design

DC scheme design

We have calculated outcomes from a specimen DC scheme, and in our modelling have compared this with outcomes from a CDC plan. The design of the baseline DC scheme is set out below.

Basic design

- Contributions have been set at 10% of pay each year – the cost of any risk benefits and expenses of administration would be in addition and has been excluded from our modelling. The full 10% goes towards providing retirement benefits.
- Pay increases in line with the UK's National Average Earnings each year, overlaid with an allowance for additional promotional increases.
- Retirement occurs at age 65, at which point the member (assumed to be male) ceases contributions and starts to draw their pension;
- We have modelled “Equity”, “Gilt” and “Lifestyle” approaches to the investment of the DC funds. These are simplified approaches – “Equity” is UK equities, “Gilt” is UK government bonds and “Lifestyle” means a 10 year linear switch from equities to gilts leading up to retirement at age 65.
- Contributions are assumed to be invested in the relevant asset class up to retirement and then disinvested to purchase an immediate annuity.

Annuity purchase

- There is an 80% chance of the member being married at age 65 (in which case the member's spouse is assumed to be female and 3 years younger and a 50% contingent spouse's pension is purchased).
- All members survive until age 65 (and continue contributing to the plan over that period).
- At age 65 the member purchases an inflation linked annuity, which increases in line with CPI each year. In practice CPI linked annuities have not existed throughout this period and so we have approximated their cost, using net interest rates and a suitable longevity assumption.
- Mortality rates are in line with the “S1PxA” standard tables published by the Actuarial Profession's Continuous Mortality Investigation (CMI), with assumed improvements in mortality rates from 2002 in line with the CMI 2011 projections model using a long-term improvement rate of 1.25% p.a.

Appendix B – Illustrative CDC plan design

CDC plan design

The base design modelled here is simply an example to draw out the key features of CDC behaviour.

We are not suggesting that this design is optimal. Although it is a reasonable candidate for investigation, there are refinements which could be made to improve its performance (depending on the criteria which one uses to measure this).

Target benefits

- 1% CARE accrual payable from age 65.
- Attaching spouse's pension payable at a 50% rate if the member dies after retirement.
- Revaluations of 100% of CPI (zero floor, no cap) – both pre and post retirement.
- Company contributions 10% of pay (no member contributions).
- Assets held 60% in UK equities, 40% in UK government bonds.
- Cash commutation would be available, but for simplicity has been excluded from this modelling.

Control mechanism

- Each year the plan's funding level (the value of the assets divided by the value of the liabilities) is measured based on the CARE-style benefits which have accrued up to that point in time.
- The funding assessment is performed using a market value of assets and a set of market-consistent best estimate assumptions for valuing the plan liabilities. The liabilities valued use the base pension to date, including any past increases awarded and any benefit cuts made. They allow for future revaluations in line with those set after the latest annual funding review (rather than the 100% CPI target).
- If the assessed funding level is outside the window of 90% - 110% then the following adjustments (in order) are made to return the funding level to either 90% or 110% by:
 - (i) The revaluation target for the current and all future years is changed via a uniform percentage adjustment up or down (with the resulting revaluation subject to a zero floor);
 - (ii) A one-off benefit reduction (applied as a fixed percentage uniformly to all members).
- Pensioner benefits are paid from the plan during retirement, rather than being bought out with an annuity provider (for example).
- Pensions in payment are exposed to both levers (i) and (ii) above.

Appendix C – Draft regularity framework

Some ground rules

A potential system of governance and financial management of CDC plans in the UK context is set out below.

Benefits

Target benefits are split into two parts:

- Base benefits, which represents the amount of all benefits accrued to date plus any past ancillary benefits awarded to the relevant date.
- Ancillary benefits, which are the expected additional benefits – principally increases to pensions in payment, and revaluations of base benefits for active and deferred members. It may also include enhanced early retirement terms and any improvements in the normal form of the pension. Using funding surpluses to improve ancillary benefits may only be allowed after all past indexing of the base benefit has been provided.

Target benefits then consist of Base Benefits plus future Ancillary Benefits.

Pivotal pension age

Benefits are expressed as payable from a Pivotal Pension Age (PPA) decided by the employer. There will be flexibility for members to choose any other age to draw all or part of their benefit, in which case actuarially equivalent benefits will be paid. The PPA will be increased (or reduced) by the Plan Actuary on a regular basis (at least once every three years) to reflect expected and experienced changes in the longevity of Plan members. The adjustment to PPA will apply to all of the benefits earned by active and deferred members – ie, in respect of both future and past accruals.

Contributions

- The employer's obligation to contribute is fixed and finalised at the point any contribution is made. The contribution may be a common percentage of pay, or may vary according to the age of the member.
- Increased employer contributions are not an inherent part of the CDC model.
- Contribution reductions or contribution holidays are not permitted for CDC plans.
- CDC plans will be funded solely by way of employer contributions. Any member contributions would be invested on a conventional DC basis, and could be applied primarily to provide the member with any desired tax free cash on retirement.

Trustees and disclosure

- A CDC plan operates at arm's length from the employer or sponsor and is administered by a group of trustees. The primary duty of the trustees is to manage the finances of the plan to award equitable distribution of investment returns to different generations of plan members.
- The Trustees' governance process and approach to financial management must be open and transparent, and subject to public scrutiny.
- The Trustees must produce and publish documents regularly on a CDC Public Website (the CDCPW).

CDC Public Website

The key documents to be disclosed on the CDC Public Website are:

- A Statement of Investment Policies, and regular reports on investment performance
- A Statement of Funding Policies and regular actuarial updates
- A Statement of Risk Management Policies, and regular testing of those principles
- A Statement of Bonus Policy and regular updates showing the operation of the bonus policy in action

Statement of Investment Policies

- The Trustees will produce a Statement of Investment Policies, setting out their policy concerning:
 - the kinds of investments to be held
 - the balance between different kinds of investments
 - risks, including the ways in which risks are to be measured and managed
 - the expected return on investments
 - the realisation of investments
 - the extent (if at all) to which social, environmental or ethical considerations are taken into account in the selection, retention and realisation of investments
- The Trustees will receive and publish regular reports on the investment performance of the Plan and the attribution of their achieved returns
- Investment reports will be produced at least quarterly

Statement of funding policies

- The Trustees must ensure that an actuary values the plan at least once a year, and publish the results on the CDCPW
- The actuarial valuation will show the extent to which there is a surplus or deficit in the plan
- The actuarial report will disclose the full assumptions underlying the calculations, to enable another independent actuary to carry out the calculations and verify the results. Assumptions will include anticipated future investment returns, correlations between asset classes as well as liability profiles
- The actuarial valuation will also disclose the probability of having to make cuts in base benefits and the actions to be taken to keep this probability to acceptable levels
- Quarterly interim updates of funding are to be encouraged, and daily updates could be made available

Statement of Risk Management policies

- The Trustees must formulate and publish details of their risk management policies and procedures
- At least once a year they will publish on the CDCPW the results of the stress testing they have carried out
- Stress testing is required to provide the flexibility and forewarning to enable the Trustees to take corrective measures so that base benefits and ancillary benefits can be delivered with the appropriate degree of confidence

Statement of bonus policy

- The Trustees must formulate and publish details of their policies for dealing with variations from their expected funding position – dealing with surpluses and deficits
- The Bonus Policy will set out how the Trustees will award additional ancillary benefits in the event that the funding is better than anticipated
- The Bonus Policy will also describe how benefit reductions will be applied if the funding is less than anticipated
- Of particular interest will be the process for reducing base benefits in the rare and unexpected circumstances where this is necessary. Different potential approaches are possible, such as:
 - The reduction is borne by all plan beneficiaries (actives, deferreds and pensioners) in the same proportion
 - The reduction is tapered so that older members (eg, those approaching and in retirement) are less likely to experience reductions. The counter to this should be that younger members gain proportionately more of the upside rewards

Payments in and out

- Any transactions between the CDC plan and other registered scheme will take place on the basis of the (disclosed) actuarially assessed fair value of the member's interest in the CDC plan
- So individual transfers will be an approximation to a share of fund – a practical computation will be required, but this should reduce the impact that even significant transfers out have on the remaining members

Appendix D – Modelling CDC design sensitivities

Control mechanism

In Section 8 of this paper we (briefly) described the results of our testing two sensitivities to the “base” control mechanism set out in Appendix B.

- In the base design, the intention is that each year an adjustment to benefits is made in line with the increase in inflation (measured by the Consumer Prices Index, or a proxy for it). If the plan has a funding level in excess of 110% then additional increases may be awarded. Conversely if the funding level falls below 90% then a lower increase may be granted and in extreme conditions benefit cuts may need to be applied (in which case they are applied uniformly across all non-pensioner and pensioner members).

- The two sensitivities we have tested are designs with alternative “control mechanisms” (that is, rules for benefit adjustment).

- The first of these has wider and asymmetric funding “gates” – no adjustment to benefits is made if the funding level is between 85% and 125%.
- The second variation looks at offering greater protection for older members, who are progressively phased out of the risk of benefit cuts from ages 65 to 75. This means that after age 75 they are receiving a protected pension, subject to the plan revaluations each year but shielded from any benefit cuts in periods of poor performance.

This appendix sets out some further detail on the comparative output from the three design variations.

Chart 13 – Historic adjustment to benefits over times

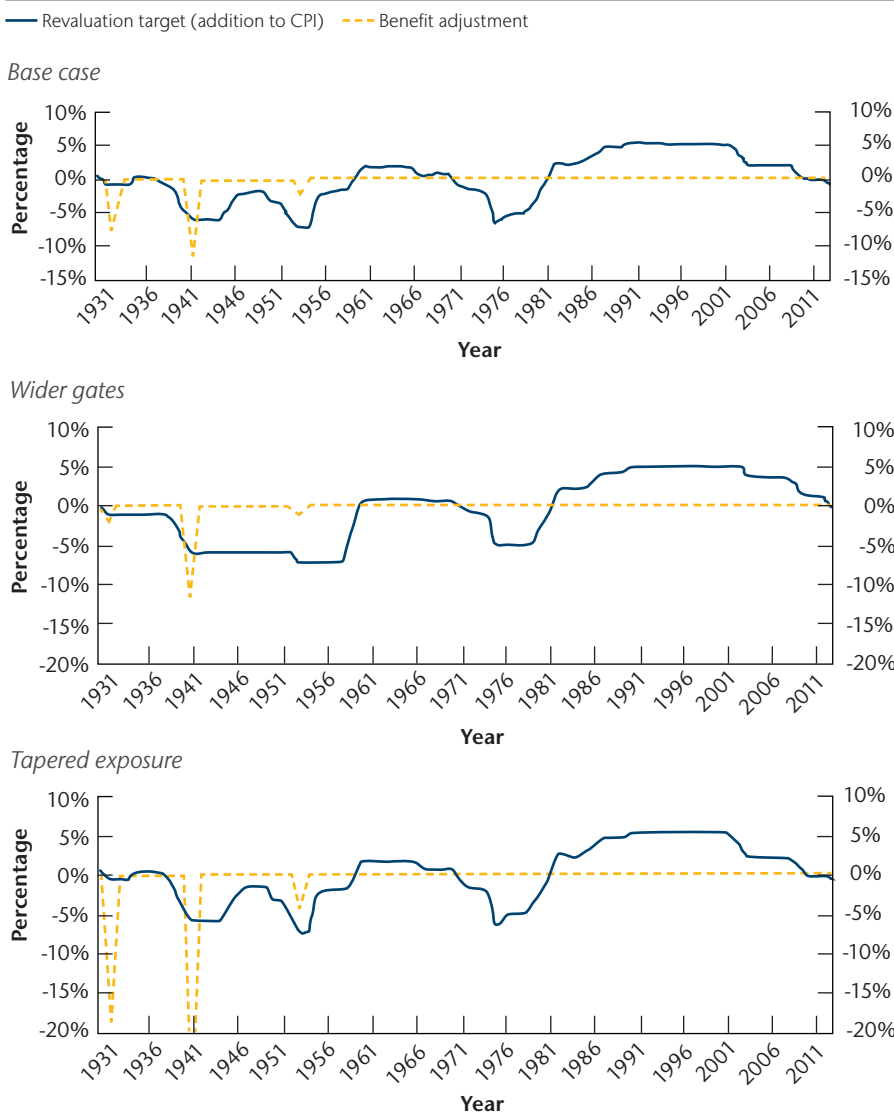
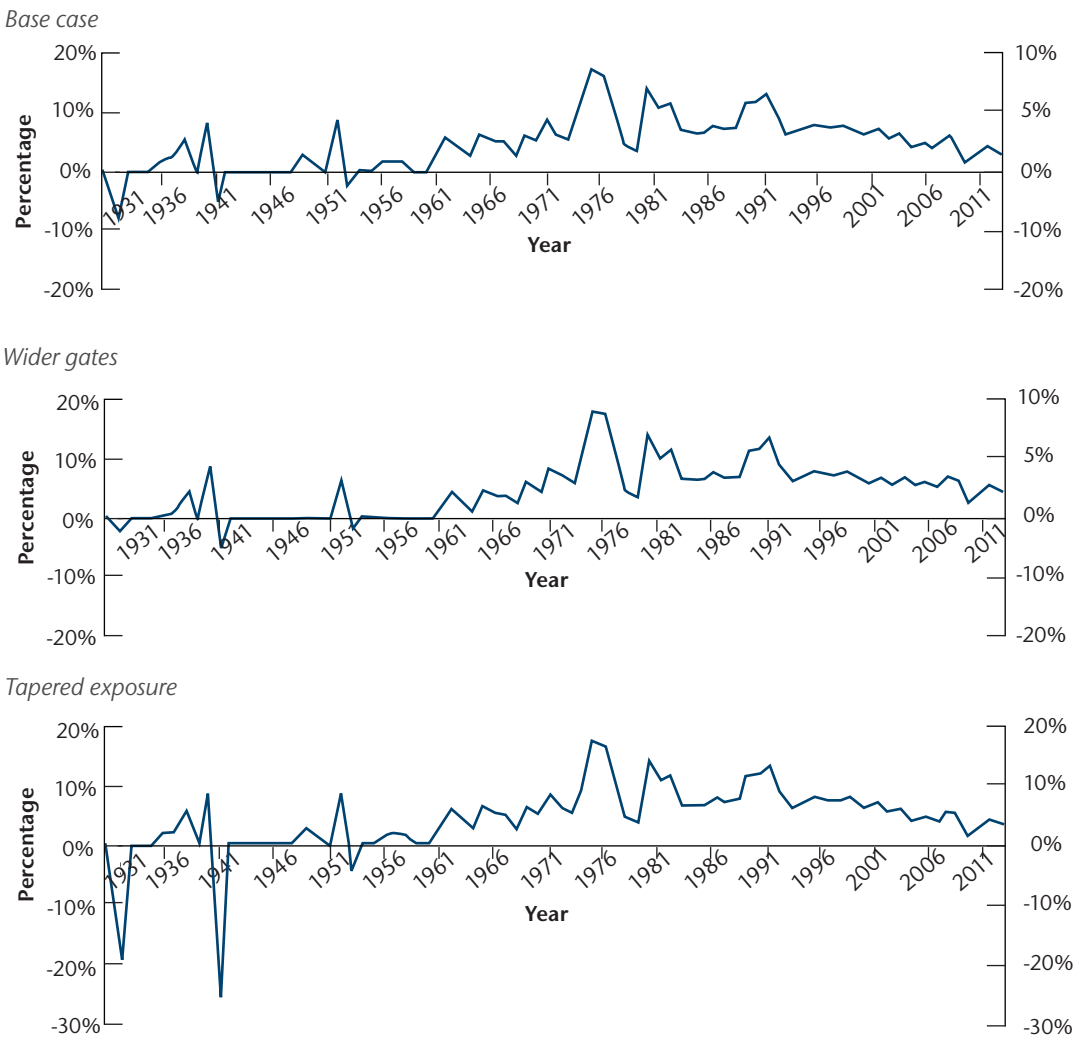


Chart 14 – Combined effect of historic adjustment to benefits over time



Observations

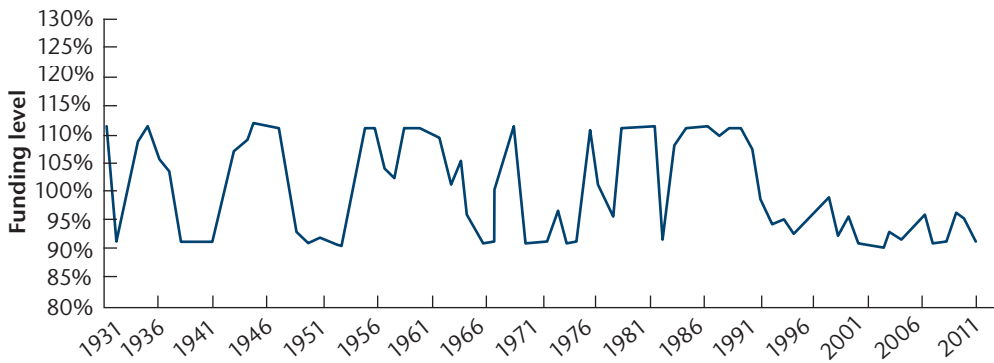
The top left figure in Chart 13 is the same as Chart 7 from the main body of the paper (and by a similar token the top left figure in Chart 14 is the same as Chart 8). The other two charts show how our design sensitivities would perform over identical financial conditions between 1930 and 2012.

You can see that:

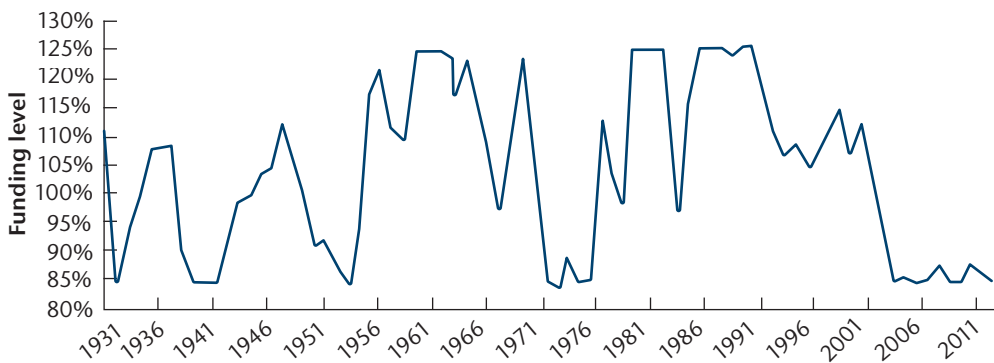
- The design with 85%-125% funding gate reacts more slowly to both good and bad performance. This means
 - The benefit cuts tend to be smaller, but...
 - ... the revaluation control mechanism is less generous more of the time. This is because the plan funding level has to improve by 40% (from 85% to 125%) in order to restore the revaluation target once it has fallen initially. This compares with a movement of just 20% in the base design.
- The design with tapered exposure to benefit cuts behaves broadly the same as the base design except where a cut is actually required.
 - This means the behaviour of the revaluation mechanism, and the incidence of cuts are unchanged, but...
 - ... when cuts are required, they apply only to the younger members (and are larger as a consequence).

Chart 15 — Historic funding level over time

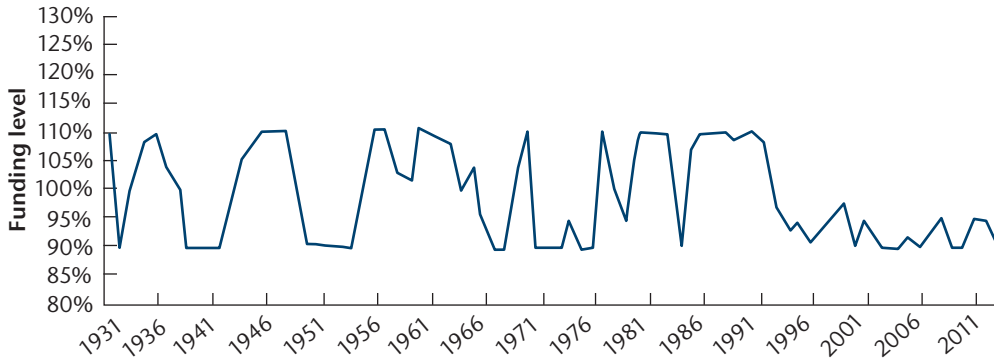
Base case



Wider gates



Tapered Exposure

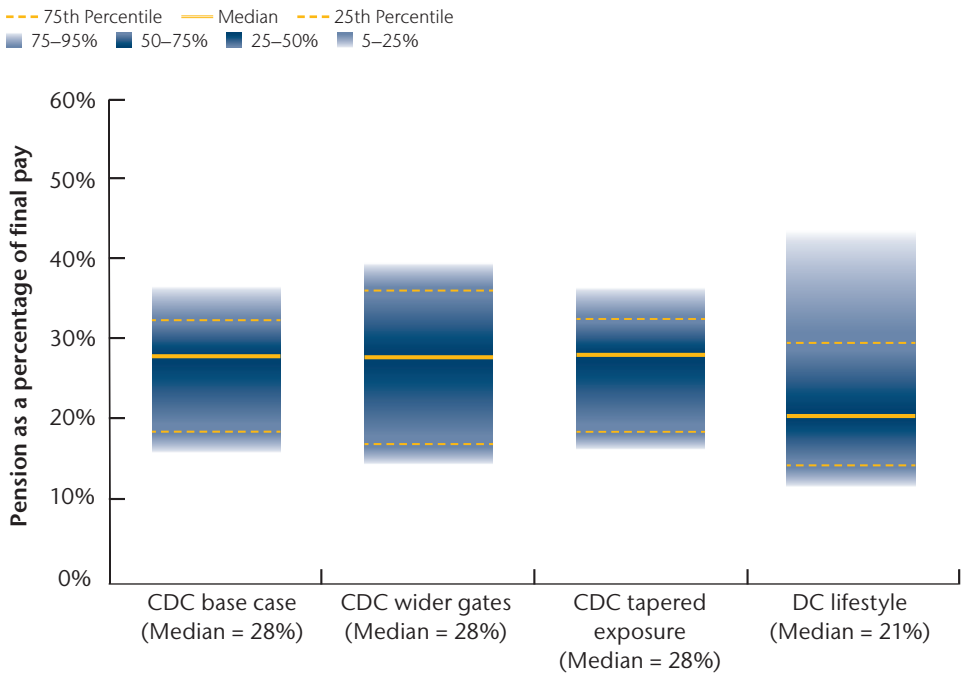


Observations

Chart 15 shows how the CDC plan's funding level would have varied over the historic period modelled.

The key point to draw from this is that the design with 85%-125% funding gate exerts a looser control over the funding level than the other designs (ie, the plan is allowed to carry a larger surplus or deficit before any correction is imposed by way of benefit adjustment).

Chart 16 — Summary of historic outcomes (for retirements 1955 to 2012)



Observations

Chart 16 shows the distribution of retirement outcomes for our three design variants (for members retiring in each of the years 1955 to 2012).

You can see from the chart above that:

- For the design with 85%–125% funding gate, members’ income replacement ratios in retirement are more uncertain overall (and less smooth between generations) than for the base design. This is because the revaluation target is more “sticky” and less inclined to average out over a time in the plan.
- The design with tapered exposure also leads to a slightly wider distribution (though this is marginal and hard to see from the charts for the past history).

Future

We have also considered the distribution of simulated future retirement outcomes for our three design variants (for members retiring in each of the years 2037 to 2046).

Our analysis demonstrates that:

- The design with tapered exposure tends to deliver a wider range of outcomes at retirement which are less stable between generations.
- The design with 85%–125% funding gate delivers slightly less stable outcomes.

Appendix E – Methodology and assumptions

Nature of calculations

The historic calculations covered in this paper are approximate estimates of the member outcomes which might have arisen in practice (under the plan designs considered).

The stochastic future projections aim to show the distribution of outcomes under a range of possible scenarios consistent with the modelling behind Aon's Global Capital Market Assumptions as at 30 September 2012.

Where we refer to a “best estimate” assumption in this paper we mean one which is expected to have an equal probability of understating or overstating the true future value.

Scenarios modelled

We have modelled past performance assuming:

- The CDC plan starts with a mature “steady state” membership profile in 1930, and is fully funded at that point.
- Between 1930 and 2012 the plan develops within its design rules, with a steady flow of new entrants, retirements and deaths, and an allowance for broad historic asset returns and other changes in financial conditions.

The future performance analysis is independent of this and assumes instead that:

- The CDC plan starts with a mature “steady state” membership profile in 2013, and is fully funded at that point.
- Between 2013 and 2062 the plan develops along one of ~450 possible simulated futures. In each case, it develops within its design rules, with a steady flow of new entrants, retirements and deaths, and an allowance for the asset returns and other changes in financial conditions associated with that simulation.
- For the past history and each of the ~450 future simulations, corresponding DC outcomes are constructed based on identical financial conditions to the CDC scenario.

Membership profile

For simplicity we have assumed that for each member in the CDC (or DC) plan:

- service commences at age 40;
- contributions are paid to the scheme at a rate of 10% of pay between ages 40 and 65;
- pay rises in line with the UK's National Average Earnings each year, overlaid with an allowance for additional promotional increases.
- retirement occurs at age 65, at which point the member ceases contributions and starts to draw their pension;
- thereafter mortality rates are in line with the assumptions adopted in the liability assessment (below).

Asset roll-forward

The assets in the CDC (or DC) plans are projected in an approximate manner year-by-year with allowance for:

- new contributions paid in;
- (for CDC) benefits paid out to pensioners;
- asset returns in line with a proxy total return index according to the broad class of investment held (UK equities, UK government bonds, or a mix of the two).

In all of the modelling assets are assessed at (approximate) market value.

For the historic analysis up to 2012, investment in “gilts” (whether in the gilts-based DC scheme, the lifestyle DC scheme or the CDC plan itself) means investment in long-dated fixed-interest UK government bonds. In practice, plans attempting to align investment performance with annuity prices in the approach to retirement might be more likely to invest in index-linked government bonds. Our modelling of future projected behaviour over the period 2013 to 2062 allows for this, but as index-linked gilts were first issued in the 1980s our historic analysis uses fixed-interest bonds throughout for consistency.

Liability assessment – financial assumptions

- The assessment of liabilities for calculating the CDC plan funding level each year is based on market consistent best estimate assumptions.
- For the purpose of the modelling best estimate assumptions are derived from the assumed market yield data at the point of assessment, with:
 - a CPI inflation assumption based on the difference between nominal and real (RPI) UK government bond yields of appropriate duration, adjusted downwards by 0.8% p.a. to make broad allowance for an assumed future gap between RPI and CPI inflation;
 - a forward-looking inflation volatility assumption of 2.3% p.a. for the historic period, reducing to 1.7% p.a. for assessment dates in the future.
- The discount rate used in the CDC plan assessment of liabilities is taken as:
 - the yield on long-dated fixed interest government bonds, plus
 - an equity risk premium in respect of that portion of the liabilities backed by UK equity holdings (to make some allowance for expected outperformance of equities over government bonds).
 - In practice the equity risk premium would be re-calibrated to a suitable best estimate each year by the plan’s actuary based on current market conditions.
 - Our modelling uses a simplistic formula to attempt to capture the first order impact of this recalibration, with a cap of 5% p.a. and a floor of 0% p.a. applied to the resulting equity risk premium before use in the discount rate.
- Given the purpose of the modelling (to illuminate broad features of CDC and DC plan behaviour) we are not attempting to use a full yield curve discount rate or inflation assumption for the funding assessment basis.

Liability assessment – demographic assumption

The demographic assumptions used for valuing the liabilities in our modelling are held fixed throughout the projections (for example, we have not modelled an increasing expectation of longevity throughout the historic period).

The reason for doing this is simply to isolate the behaviour of CDC and DC plan designs under changes in financial conditions. Mixing this with variations in the demographic assumptions would have made the analysis less transparent (though of course we would expect changes to the demographic assumptions from time to time if managing a CDC plan in practice).

The key assumptions used are:

- Male gender for the plan member;
- 80% chance of being married at age 65 (in which case the member's spouse is assumed to be female and 3 years younger than them) and a 50% contingent spouse's pension is provided;
- All members survive until age 65 (and continue contributing to the plan over that period);
- From age 65, mortality rates are
 - in line with the "S1PxA" standard tables published by the Actuarial Profession's Continuous Mortality Investigation (CMI), with
 - assumed improvements in mortality rates from 2002 in line with the CMI 2011 projections model using a long-term improvement rate of 1.25% p.a.

Projected income replacement ratio

When we talk about the projected ratio of pension to final salary at retirement (for example, in Charts 5 and 11), what we mean is:

For CDC

- The member's accrued pension to date...
- ... plus the pension expected to accrue at the 1% CARE rate if they remain in service between now and retirement at age 65...
- ... in each case projected to age 65 assuming CARE revaluations in line with CPI subject to an annual floor of 0%...
- ... divided by projected pay at age 65.
The member's current pay is assumed to grow in line with CPI + 1.5% p.a. (subject to an overall minimum of 0%) with an overlay for promotional increases consistent with the membership projection assumptions.

The member's projected pay affects both the pension assumed to accrue over future years, and the final pay at retirement against which their pension is measured (to calculate an income replacement ratio).

For DC

- The member's accumulated pot of contributions...
- ... plus the contributions expected to accrue if they remain in service between now and retirement at age 65...
- ... in each case projected to age 65 using a deterministic asset return assumption based on government bond yields at the time (allowing for an equity risk premium, where relevant, of 3.5% p.a.)...
- ... and finally converted to a pension figure at age 65 based on an assumed annuity rate reflecting financial conditions at the time.

The pay growth assumption used for this DC projection is consistent with that used for the CDC projection.

Both the "future" annuity rate used in this projection, and the "actual" annuity rate used to convert a member's fund to a pension stream when they reach 65, are based on:

- consistent mortality assumptions to the CDC funding assessment basis;
- an assumed discount rate in line with long-dated fixed-interest UK government bonds (and no risk premium).
- This is intended to give a very broad benchmark measure of the annuity rate a member might be able to secure on retirement in the year in question, allowing for the approximate impact of changing market conditions over time.

Historic data

The historic total return indices, real and nominal government bond yields, annual inflation and National Average Earnings growth figures assumed for the period 1930 to 2012 are based on:

- Financial data from Barclays' published 2012 "Equity Gilt Study"...
- ... with suitable extrapolations where series are not available; for example:
 - Real government bond yields did not exist prior to 1983, so before that point we have assumed "notional" real yields consistent with a 10 year central moving average of realised inflation;
 - Similarly, for the period prior to publication of the National Average Earnings index we have assumed earnings inflation in line with RPI growth +0.7% p.a.

Stochastic simulation data

The distributions of future total return indices, real and nominal government bond yields, annual inflation and National Average Earnings growth figures assumed for the period 2013 to 2062 are based on ~450 independent simulations from the proprietary Aon Asset Model, calibrated to market conditions at 30 September 2012.

This is an econometric model designed to generate plausible (and plausibly volatile) future scenarios in the financial markets. It has the following key features:

- Arbitrage free
- Market consistent
- Full yield curve
- Fat tails to reflect observed market characteristics

Actions

Aon has carried out significant research into CDC plan designs and is actively consulting with the DWP on the implementation of CDC in the UK. We are interested in hearing your thoughts on how pension provision should evolve in the UK. We would also relish the opportunity to talk to you about our work in the CDC arena, both to get your input into the subject and to continue to evolve our CDC template design.

If you would like to discuss any of the Government's proposals further, see further details of our research or would like more information, please speak to your usual consultant or one of the CDC team.

Limitations and scope

The figures and charts in this paper are intended as an illustration of the research that we are conducting at Aon, and as a starting point for further discussion.

They do not constitute formal advice and should not be relied upon in themselves to make policy decisions.

In particular, this paper is not subject to "Technical Actuarial Standard R: Reporting Actuarial Information" (or to the other Technical Actuarial Standards in force at the time of writing).

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