

Who carries the risk?

Asset-allocation challenges for defined-benefit pension schemes and their sponsors on the road to buyout.





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Who carries the risk?

Asset-allocation challenges for defined-benefit (DB) pension schemes and their sponsors on the road to buyout.

"If the UK economy and its financial markets evolve according to the latest official forecasts, the net supply of index-linked gilts over the next 10 years could be more than £500 billion short of the amount required by the UK DB pension schemes and their sponsors as protection against inflation uncertainty. Correcting this shortfall would demand a material increase in the proportion of gilts outstanding that are index-linked from around 25% to as much as 75%, whereas ignoring it would leave the DB pensions industry paying a sizeable hidden tax."

Executive Summary

- The environment that has been in place since the turn of the century has been an exceptionally challenging one for UK DB pension schemes. It has, on occasion, caused corporate sponsors of underfunded schemes to pay out around one quarter as much in deficit reduction contributions as the amount spent by all private sector firms on fixed capital, potentially reducing the productive capacity of the UK economy.
- The vast majority of the more than 6,000 schemes monitored by the Pension Protection Fund are now closed, either to new members or to future accruals. Nevertheless, the DB pensions landscape presents an enduring legacy. Even after adjusting for inflation, the level of cash payments made 40 years from now is likely to be just as high as it is today.
- From the perspective of trustees struggling to reduce scheme deficits, the official forecasts for the UK economy published by the Office for Budget Responsibility in July 2014 as part of its Fiscal Sustainability Report are, to say the least, encouraging. Growth averages some 2¼%, inflation remains close to target, and there is a steady normalisation of gilt yields.
- Using our DB pension scheme model we find that, if these forecasts turn out to be broadly correct, the sector as a whole should be restored to a position of full funding by 2019.
- Looking across the distribution of outcomes for individual schemes, we find that, by 2021, just over half of all schemes will have reached a buyout level of funding. In this relatively optimistic scenario, only a small proportion of schemes fail. Specifically, we find that, by 2050, fewer than 5% of schemes will have sought protection from the Pension Protection Fund, transferring cumulative section 179 deficits of some £7 billion.
- But there is a cloud hanging over this fair-weather scenario. As scheme funding improves, we would expect those responsible for managing the assets of a scheme that has reached a buyout level of funding to demand more protection against unexpected movements in inflation, and therefore to demand more index-linked gilts.
- However, if the UK Debt Management Office issues and buys back gilts as it currently does, so that the proportion that are index-linked stays close to 25%, then over the next 10 years the industry could be facing a cumulative shortage of these assets that runs to more than £500 billion.
- In response, the UK government could choose to issue more index-linked gilts than are required to finance the deficit, and to use the proceeds to buy back conventional gilts. But it would need to do this on a very large scale. Under the official forecasts described above, we find that the proportion of all gilts that are index-linked would need to rise from 25% to 75% in order to meet the needs of DB schemes over the next 10 years.
- The alternative is to leave the DB industry substantially exposed to unexpected changes in inflation. That could have major implications for the solvency of both individual schemes, and their sponsors, and by extension for the Pension Protection Fund. Ultimately, it may lead to restrictions being placed on the benefits received by many scheme members.

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Introduction

UK DB pension schemes are a dying breed – that, at least, would be the impression gained by anyone entering employment in the private sector today. Among the more than 6,000 schemes monitored by the Pension Protection Fund (PPF), the proportion that are open both to new members and to future accruals has tumbled from around 90% in 2000 to little more than 10% in 2014. But their legacy will endure. Outstanding commitments are so large that, by our calculations, the level of payments will be just as high 40 years from now, even after adjusting for inflation, as it is today.

In our first report with Pension Insurance Corporation, "What next for UK pension funds: Yield normalisation, or Financial Repression?", published in November 2013, we assessed the consequences for scheme funding of three alternative macro-economic and financial market scenarios, ranging from a rapid normalisation of yields at one end, through to financial repression at the other. In this follow-up report, we take a different approach. To keep things simple, we put to one side many of the big questions confronting economists and investors today, and focus instead on a single scenario. Specifically, we assume that the UK evolves largely according to forecasts made by the Office for Budget Responsibility (OBR) at the time of the July 2014 Fiscal Sustainability Report (FSR). These forecasts will have underpinned HM Treasury's long-term fiscal plans, and consequently can be seen as having had implicit official backing.

According to the OBR scenario, things will go rather well for the UK economy. Growth stabilises at a little over 2% per annum, inflation stays close to target, and the primary budget balance moves back into surplus before the end of the decade. Gilt yields normalise gradually over the next 10 years or so, materially improving the funding position of all DB schemes. We analyse the consequences for the maturing DB sector of a world in which the UK economy and its financial markets evolves largely according to official expectations. How many schemes reach a buyout level of funding in this environment, and how many seek protection from the Pension Protection Fund (PPF)? How large are the balance sheets of the schemes that succeed, and how large are the balance sheets of the schemes that fail? We also pay particular attention to the shifting preferences of asset allocators as funding improves and schemes mature. Will there be sufficient fixed-income assets to go around? And who will buy the equities offered up in exchange?

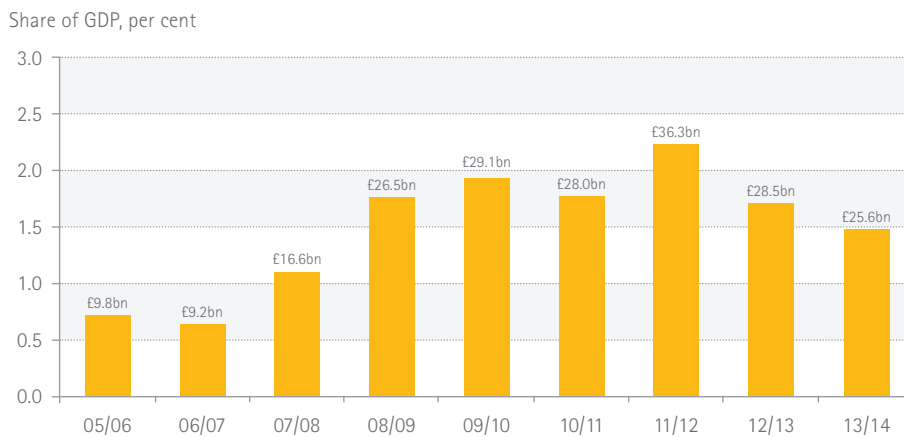
The remainder of this report comes in four sections. In the first section, we identify some of those factors that have contributed to the closure of so many DB schemes over the past 10 to 15 years. In the second section, we describe in detail the economic and financial market assumptions that underpin our OBR scenario. In the third section we map out the implications for the assets and the liabilities of DB pension funds, both in aggregate and across individual schemes. In a final section, we outline some potential imbalances between the net demand for, and the net supply of, UK equities and index-linked gilts that are likely to arise.

1. An enduring legacy

This section outlines some of the factors that have prompted the closure of all but a handful of private sector, DB pension schemes since the turn of the century. Although barely 5% of the working population continues to acquire rights under these schemes, the entitlements already earned are substantial. Some 40 years from now cash payments made to scheme members are likely to be just as high, even after adjusting for inflation, as they are today.

We began our first report by describing some of the challenges that have faced DB pension schemes and their corporate sponsors in recent years. We found that, during the period since the bursting of the dot com bubble in early 2000, balance sheets had been 'squeezed from both sides'. In the 10 years through to 2009, equity returns had failed even to keep pace with inflation. Returns to other asset classes, notably fixed-income, were better. Nevertheless, we judged that the overall performance of the typical DB portfolio during that 10-year period was probably the worst for three decades. On the liabilities side, schemes were hit first by historically large improvements in longevity. More recently, funding had been further eroded by falling nominal yields against a backdrop of unexpectedly high inflation.

Figure 1: Historic deficit reduction contributions



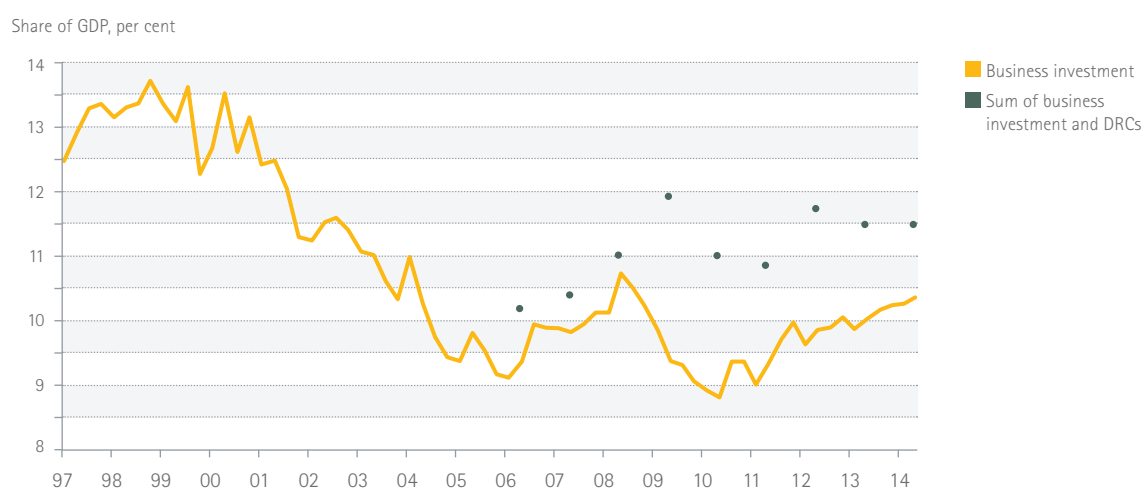
Sources: Thomson Reuters Datastream / Pension Protection Fund / Fathom Consulting

The financial consequences for scheme sponsors of poor asset returns through the 2000s, together with persistent upward revisions to scheme liabilities, can be seen clearly in the data on deficit reduction contributions (DRCs) published by the Pension Protection Fund (PPF) and shown in Figure 1¹. DRCs rose from a low point of £9.2 billion, or just under 1% of GDP in Financial Year (FY) 2006/07, to peak at £36.3 billion, or more than 2% of GDP in FY 2011/12.

¹ DRCs are payments by the sponsor of a scheme over and above regular payments made in proportion to the wage bill for active members. They are made with the aim of bringing a scheme that is in deficit back to a position of full funding over a period of time that is agreed with the employer and approved by the Pensions Regulator.

These sizeable payments will have been judged necessary by the trustees, agreed with the employer, and approved by the Pensions Regulator in order to protect the security of members' benefits. Nevertheless, the requirement for sponsors of DB schemes to make good on their pension promise, even in such straightened times, meant that the quantity of internal funds available for more directly productive activities, such as investing in fixed capital, was less than it would have been otherwise.

Figure 2: UK business investment



Sources: Thomson Reuters Datastream / Pension Protection Fund / Fathom Consulting

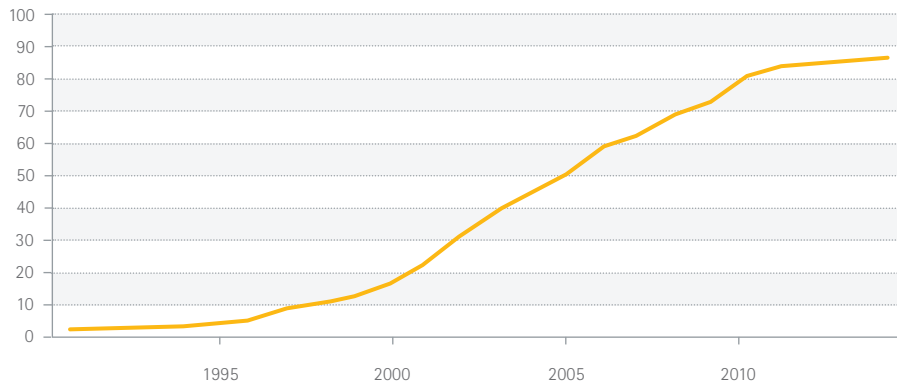
In FY 2011/12, corporate sponsors of underfunded DB schemes paid out around one quarter as much in DRCs as the amount spent by all private sector firms on fixed capital. Figure 2 shows that, as a share of GDP, UK business investment fell steadily through the early 2000s, from around 13% to less than 10%. It has subsequently recovered a little, and in 2014 Q2 stood at 10.2%. Nevertheless, that is more than two percentage points below an equivalent figure for the US. There are many potential explanations for the decline in UK business investment as a share of GDP, including a perceived lack of demand for the goods and services produced by UK firms, and more recently, inadequate access to bank finance. However, it seems likely that the need for corporate sponsors of DB schemes to address existing pension deficits, together with substantial uncertainty regarding the magnitude of DRCs that would be needed in the future, will also have played a part. It may be that the open-ended nature of the DB promise, and the consequent exposure of many firms, large and small, to gyrations in financial markets that otherwise would have no impact on their day-to-day business, is at least partly to blame for the UK's poor productivity performance since the Great Recession took hold back in 2008.

1. An enduring legacy

It is hard to attribute the declining popularity of DB schemes among employers to just one factor, though many of the developments we have outlined so far will have played a part. Some blame legislative changes including the introduction, back in 2001, of Financial Reporting Standard 17 (FRS17), which created a more or less mechanical link between market-determined yields and scheme liabilities. Subsequently, the Pensions Act 2004 crystallised the employer's pension obligation as a binding liability from which it could not walk away. It effectively laid down the groundwork for a more powerful regulator. Since its inauguration in April 2005, the Pensions Regulator has required trustees of underfunded schemes to submit a credible recovery plan that, with help from the corporate sponsor, would see the scheme return to a position of full funding within an agreed timeframe. Others might argue that these developments merely enshrine in law a commitment that was already there. What seems certain is that developments since the turn of the century, in the global economy and its financial markets, and in human mortality, have made clear the degree to which the provision of a DB scheme can distract from a firm's core business.

Figure 3: Closed schemes

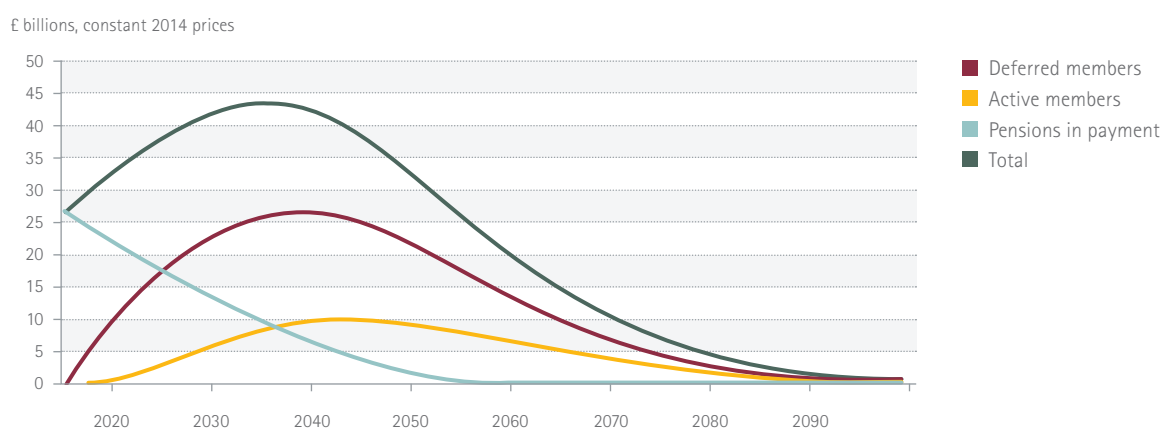
Share of PPF-eligible universe, per cent



Sources: Pension Protection Fund / Fathom Consulting

Figure 3 shows that the closure rate of DB schemes began to pick up in 2000. Using data from the PPF we estimate that, between March 2000 and March 2009, the proportion of schemes that were closed either to new members or to future accruals, rose from 11% to 71%. By March 2014, only 13% of schemes monitored by the PPF were still open. While the rate at which further DB entitlements are being earned is now very low, particularly across the private sector, the quantity of DB rights already acquired is vast.

Figure 4: Constant price cash payments across all DB schemes



Source: *Fathom Consulting*

By March 2014, there were still more than 11 million memberships of the more than 6,000 DB schemes monitored by the PPF². Of these, just fewer than 2 million were active, and were continuing to accrue new pension rights. The remainder were split almost equally between deferred memberships and pensions in payment. We have adapted our model of a typical DB scheme to project the flow of cash payments that are likely to be made in aggregate by DB schemes between now and the end of this century³. The projections, which are shown in Figure 4, take into account only those rights that have already been accrued. We find that, in inflation-adjusted terms, total cash payments are unlikely to reach a peak for more than 20 years. Even in 40 years, the burden of payments will probably be just as great as it is today. Despite a wave of scheme closures since the turn of the century, those schemes already in place present an enduring legacy.

² We use the word membership, rather than member, because an individual may build up a number of scheme memberships through his or her working life.

³ More information about Fathom's DB pension model is available on request from enquiries@fathom-consulting.com

2. Long-term prospects for the UK economy

This section describes the latest official forecasts for growth, inflation and the public finances over the longer term. It considers the implications for gilt yields, and for the market value of gilts in circulation.

As the rate at which additional pension entitlements are being accrued has fallen so dramatically, a central aim of this report is to consider the outlook for the DB landscape as we move into the decumulation phase, and assets under management begin to fall. Relevant questions include:

- How many schemes will make it to a buyout level of funding, and how quickly will they achieve this?⁴
- How many schemes will seek protection from the PPF?
- What types of assets will DB schemes want to hold in future? And what assets will be available for them to hold?

In essence, and putting longevity risks to one side, the balance between the number of schemes that 'succeed', and the number of schemes that 'fail', will depend largely on two economic and financial market factors. These are: the path of gilt yields adjusted for expected inflation; and the outlook for UK productivity growth. It is productivity growth that ultimately determines the ability of an economy to produce goods and services, and by extension, to pay wages, to create profits, and to generate returns to financial assets.

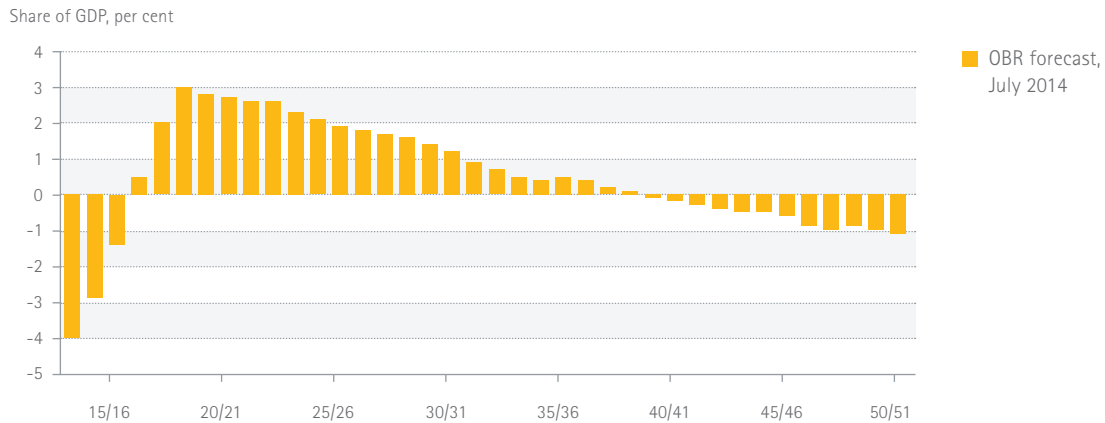
In our first report, we gave near-equal consideration to three alternative macro-economic and financial market scenarios. In this second report we highlight just one. Specifically we use forecasts published by the OBR in July 2014 as part of its FSR. Although independent of government, the OBR is nonetheless an official body. Its forecasts play an important role in shaping UK macro-economic policy. And we believe that examining the consequences for the DB industry of this official view of the economic outlook is a worthwhile exercise.

Of particular importance are the OBR projections for trend growth, for inflation, and for the general government primary balance. For a given rate of interest on government debt, this final component determines the overall general government balance, and by extension, net gilt issuance. In July 2014, the OBR published projections for trend growth from 2014 out to 2018. Trend growth was projected to rise from just below 2% before settling at around 2¼%. We have held trend growth fixed at 2¼% beyond 2018. CPI inflation was expected to return to the 2.0% target by the early part of next year, and remain there indefinitely.

By feeding these official projections for trend growth, for inflation and for the general government primary balance into our own Long-Horizon Asset Allocation (LHAA) model, we are able to obtain projections for both conventional and index-linked yields, for the overall general government balance, for net gilt issuance, and for returns to a range of other assets including equities and corporate bonds, all of which are consistent with the assumptions that underpin the OBR's July 2014 FSR.

⁴ As in our first report, we assume that a scheme reaches a buyout level of funding when its assets equal 125% of its technical provisions.

Figure 5: General government primary balance

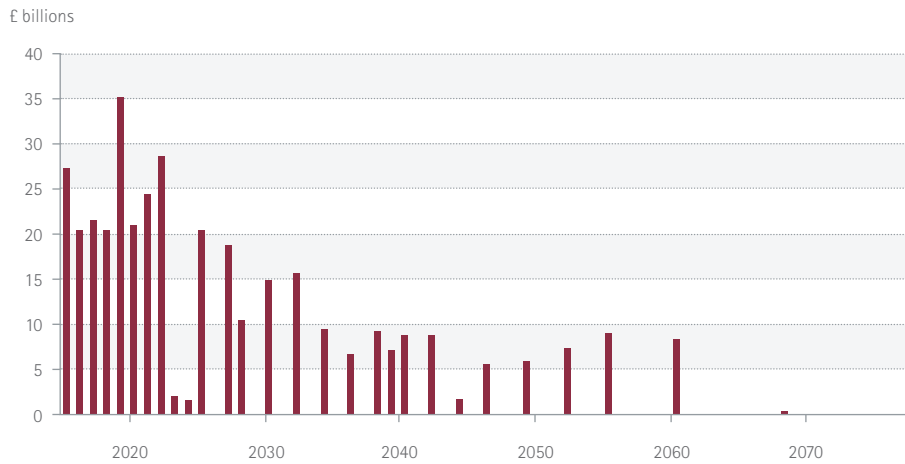


Sources: Office for Budget Responsibility / Fathom Consulting

OBR projections for the general government primary balance out to 2050 are shown in Figure 5. Officially the primary deficit, equivalent to 4.0% of GDP in FY 2013/14, was expected to narrow dramatically over the next year or two, before moving into surplus in FY 2016/17. By FY 2018/19, the OBR was forecasting a primary surplus equivalent to 3.0% of GDP. Beyond that point, the primary balance moves gradually, over many years, back into the red as improvements in longevity shift the balance between those in work, and those out of work and receiving benefits, including unfunded public sector pensions.

2. Long-term prospects for the UK economy

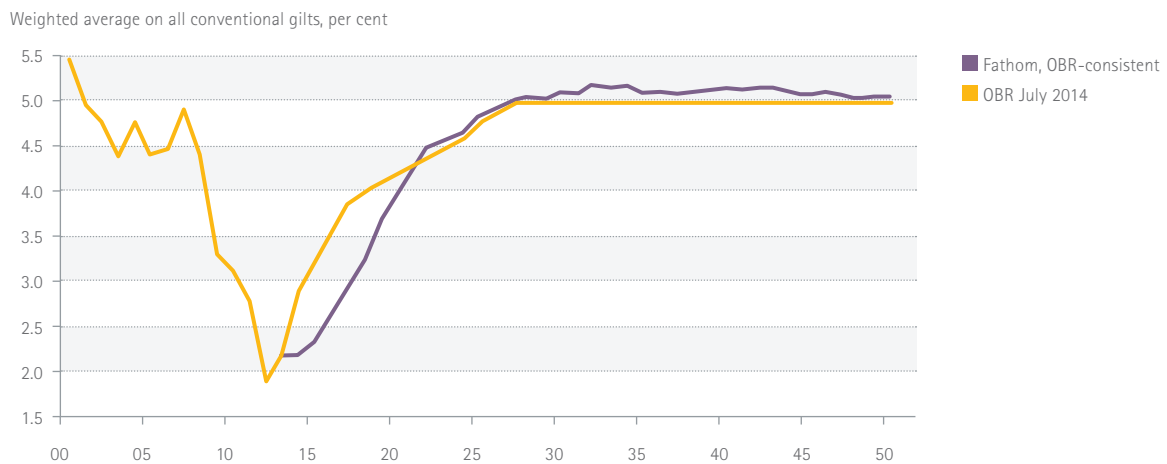
Figure 6: APF gilt holdings by maturity



Sources: Bank of England / Fathom Consulting

Our LHAA model, described in more detail in Appendix 1, requires that we make an assumption about the evolution of the stock of gilts held by the Bank of England's Asset Purchase Facility (APF). The Bank of England's Monetary Policy Committee (MPC) has announced that it will stop re-investing the proceeds of maturing gilts at some point after the first increase in Bank Rate. It must then decide whether to take a passive approach, unwinding its position slowly over time as existing holdings mature, or whether to engage in active sales. In our simulations, we assume a passive approach. With the first increase in Bank Rate expected next year, the MPC votes to stop re-investing the principal from maturing gilts at the beginning of 2016. As Figure 6 shows, that would mean that the bulk of APF holdings would be returned to the private sector by the early 2020s. The APF would, however, retain some gilts until as late as 2068.

Figure 7: Gilt yield



Sources: Office for Budget Responsibility / Fathom Consulting

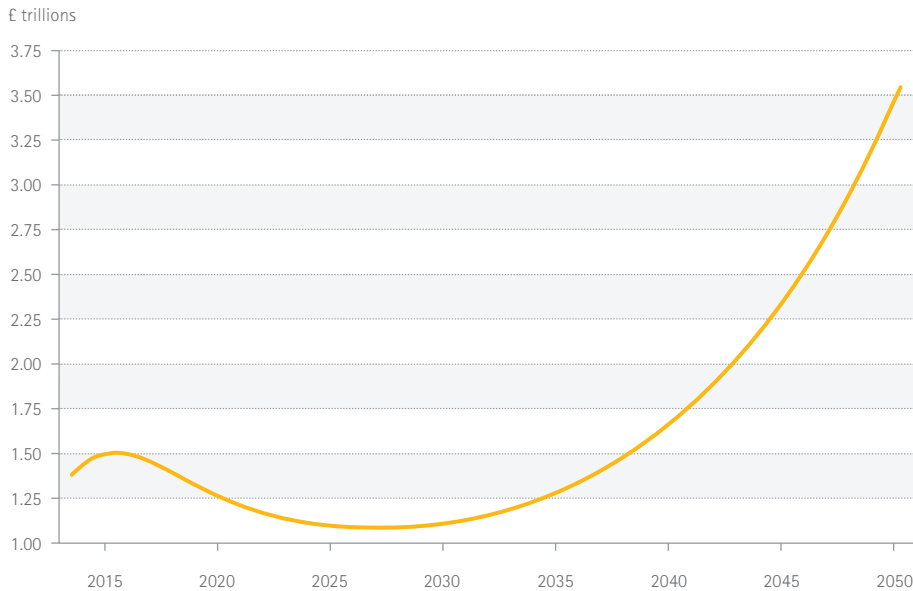
The path for the weighted-average yield on all gilts that emerges from our model is shown in Figure 7. In the early stages, it differs somewhat from the profile published by the OBR in the July 2014 FSR. In large part, the gap is likely to reflect different starting assumptions. The OBR forecast that yields would rise steadily from 2.6% in FY 2013/14 to 2.9% in FY 2014/15. However, yields have actually fallen since the summer, and at the time of writing were close to 2%. That is the starting point for our projection. From the perspective of scheme funding the salient point is that the projections shown in Figure 7 embody a steady normalisation, with yields rising above 4% by the end of this decade, finally hitting 5% a little over 10 years from now.

It is worth noting, however, that neither the path for gilt yields set out by the OBR in July 2014, nor the OBR-consistent path derived from our LHAA model, are at the time of writing priced-in by financial markets. When data for this report were finalised, the forward government liability curve published daily by the Bank of England was below 4% at every maturity. Speaking in October 2014, the Bank of England's Chief Economist Andrew Haldane drew attention to the fact that a comparison between the government liability curve and inflation swaps suggested that investors were pricing in a negative real rate of interest for at least the next 50 years!⁵

⁵ 'Twin Peaks', speech given by Andrew G Haldane on 17 October 2014 at the Kenilworth Chamber of Trade.

2. Long-term prospects for the UK economy

Figure 8: Market value of all gilts



Source: *Fathom Consulting*

In Figure 8, we show a path for the market value of all gilts that is consistent both with our forecasts for conventional and index-linked yields, and with our forecast for the overall general government balance. It shows that the market value of all gilts is likely to rise for the next year or two, before starting to fall. There are two factors at play here. Rising gilt yields imply falling gilt prices. Initially, this effect is dominated by the need to issue more gilts to fund the deficit. But by FY 2017/18, the overall general government balance is back in surplus – one year after the primary balance – implying net purchases of gilts by the DMO⁶. Both factors are pushing in the same direction, causing the market value of all gilts to fall quite sharply from this point. As we discuss in the concluding section of this report, a fall in the quantity of gilts in circulation towards the end of this decade would have profound implications for the large number of DB schemes that, by that time, and in the yield environment envisaged by the OBR, are likely to be reaching a full buyout level of funding.

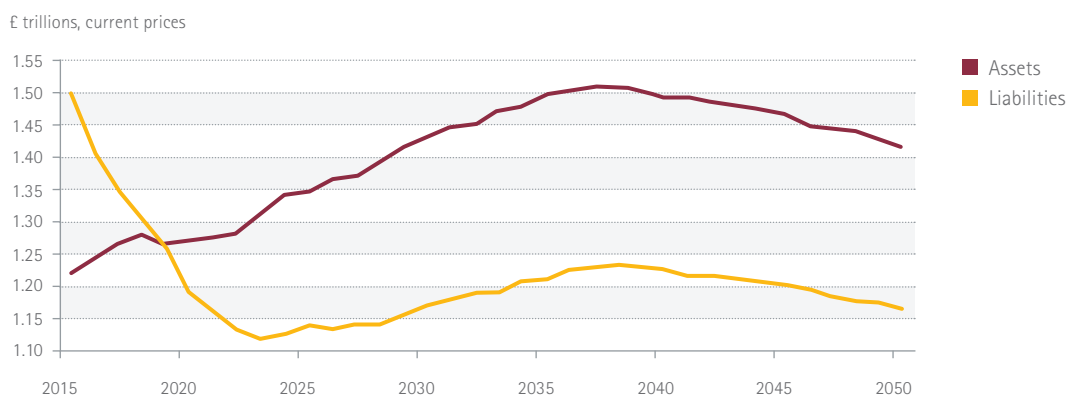
⁶ The OBR forecasts made in July 2014 had the overall balance moving into surplus one year later, in FY 2018/19. The discrepancy is likely to reflect the difference in projected yields in the near term, with the OBR forecast for yields around one percentage point higher than our own until the end of the decade.

3. Winners, fighters and losers on the road to buyout

This section describes the long-term outlook for scheme funding in an environment where the UK economy and its financial markets evolve according to forecasts published by the OBR in July 2014. It considers the implications for the Pension Protection Fund, and for those managing the assets of schemes that have reached a buyout level of funding.

The results presented in this section are derived from an updated and expanded version of the DB pension scheme model that underpinned much of the analysis in our first paper. A detailed description of our amended model can be found in Appendix 2.

Figure 9: Assets and liabilities of the DB universe

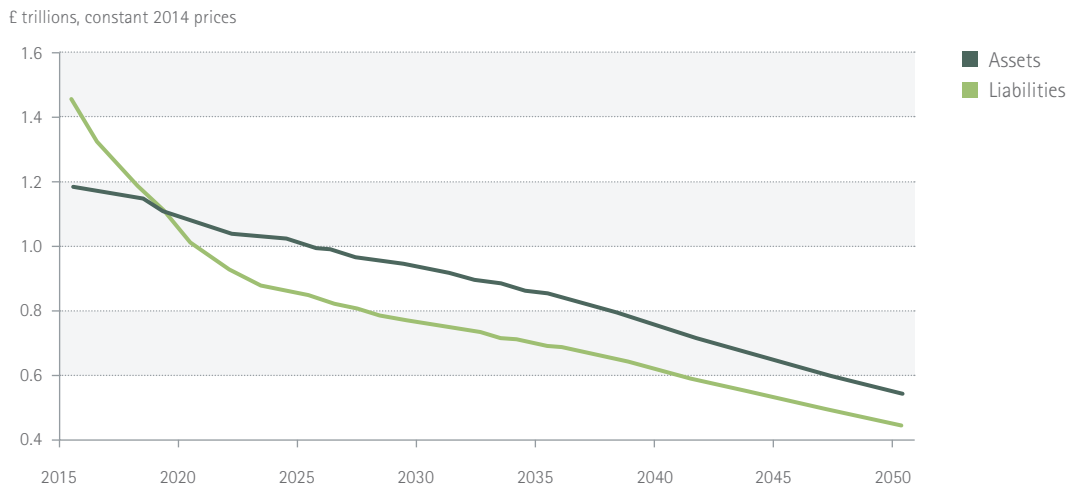


Source: Fathom Consulting

With yields returning to around 5% in a little over 10 years, liabilities fall sharply in the early stages of our simulation – see Figure 9. Despite the normalisation of yields, asset returns are initially positive, because the proportion of fixed-income assets in the total portfolio starts out relatively small, at just over 40%. With liabilities falling and assets rising in this environment, the DB universe is fully funded in aggregate by the end of the decade. In cash terms, assets peak during the late 2030s. By this stage, contributions from scheme sponsors have all but dried up, and income earned on the portfolio is insufficient to match cash payments to pensioners. Figure 10 (overleaf) shows that, after adjusting for inflation, both assets and liabilities are falling throughout the simulation.

3. Winners, fighters and losers on the road to buyout

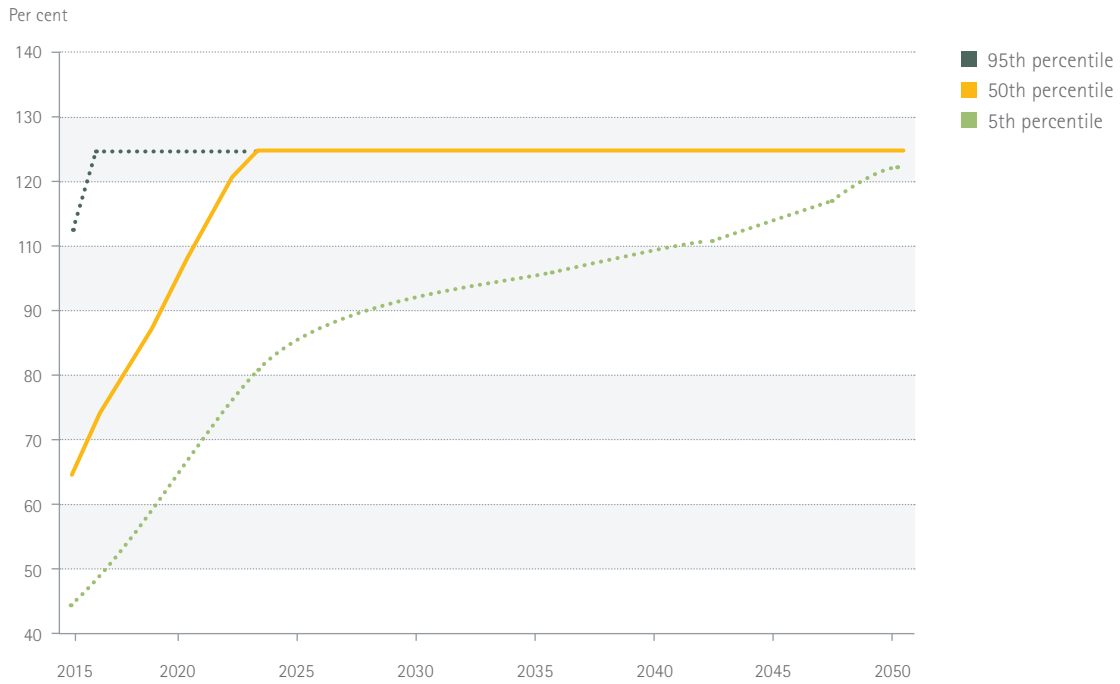
Figure 10: Assets and liabilities of the DB universe



Source: Fathom Consulting

Figure 11 (opposite) records the distribution of possible future funding ratios across the more than 6,000 schemes currently monitored by the PPF. It is a conditional projection because it assumes that the official OBR forecasts for growth, for inflation and for the public finances set out above are on average correct. The width of the distribution reflects both the range of initial conditions – by the end of FY 2013/14, a good number of schemes were already fully-funded on a technical provisions basis, while a handful were less than 50% funded – and residual uncertainty about macro-economic and financial market outcomes that would exist even if the OBR forecasts were correct on average. The distribution of outcomes in Figure 11 does not take into account the fact that current market pricing implies a backdrop that is quite different from that envisaged by the OBR. In that respect Figure 11 deliberately understates the true amount of uncertainty, in order to allow us to reach meaningful conclusions and policy recommendations.

Figure 11: Distribution of funding ratios

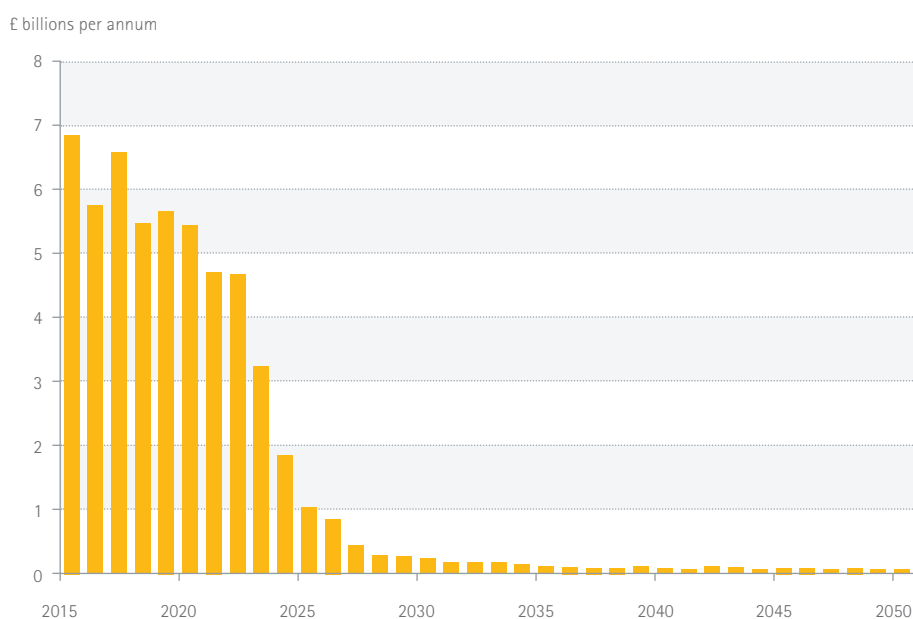


Source: Fathom Consulting

Using the OBR's projections, the majority of schemes become fully funded by 2018. That is because the solid yellow line, which represents the median funding position across all schemes, passes through 100% in that year. Four years later, the majority of schemes will have reached a full-buyout level of funding. Of course, some schemes will be less fortunate. One in 20 schemes will still be underfunded even in 2030, and even in the distinctly rosy OBR scenario. Among these unfortunate few, we will find schemes that faced a tough set of initial conditions – such as a low funding ratio or a weak corporate sponsor – and schemes that suffered unusually poor returns to their portfolio. At the other end of the distribution, a small number of schemes will reach a buyout level of funding within a year.

3. Winners, fighters and losers on the road to buyout

Figure 12: Deficit reduction contributions



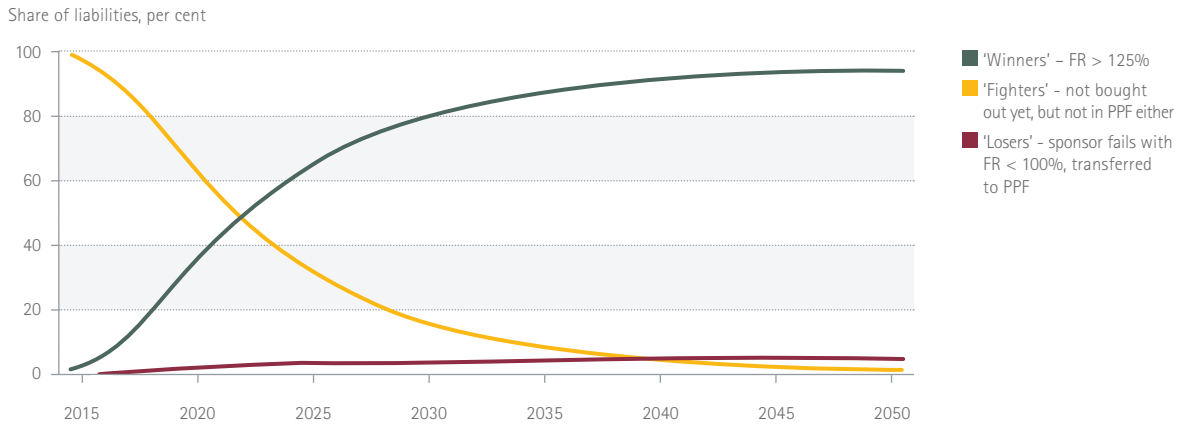
Source: Fathom Consulting

We assume that the corporate sponsor of an underfunded scheme is required to make DRCs whenever it appears that the scheme is unlikely to return to a position of full funding within the agreed recovery period. The expected level of DRCs across the universe of DB schemes is shown in Figure 12. In our OBR scenario, an environment for gilt yields that is much more benign than the one that has been in place since the financial crisis hit ensures that DRCs drop off quickly. Next year, DRCs total just under £7 billion, compared with a figure for FY 2013/14 of £26 billion. Over the next 10 years, DRCs average around £5 billion a year. That is equivalent to somewhere between 2% and 3% of annual business investment.

The future for a DB scheme that is now closed, either to new members or to future accruals, can be viewed as something of a battle. In that battle there will be winners, there will be losers, and there will be schemes that keep on fighting. When considering the outlook for the universe of DB schemes, we define a 'winner' as a scheme that has reached a buyout level of funding, and we define a 'loser' as a scheme that has lost its corporate sponsor at a time when it was less than fully funded on a section 179 (s179) basis. When a scheme 'wins' its assets will, in many cases, be transferred to an insurance company⁷. When a scheme 'loses', both its assets and its liabilities are transferred to the PPF. In the middle are the 'fighters'. These schemes have neither reached a buyout level of funding, nor have they sought protection from the PPF.

⁷ In the case of some larger schemes, the assets may continue to be held by the trustees and managed in much the same way as an insurer might choose to manage them. Nevertheless, in order to keep things tractable, the remainder of this report is written as if the assets of all schemes that have reached a buyout level of funding are managed by insurers – even though in practice they may continue to be managed by a group of trustees operating in much the same way as an insurer.

Figure 13: Scheme typologies through time

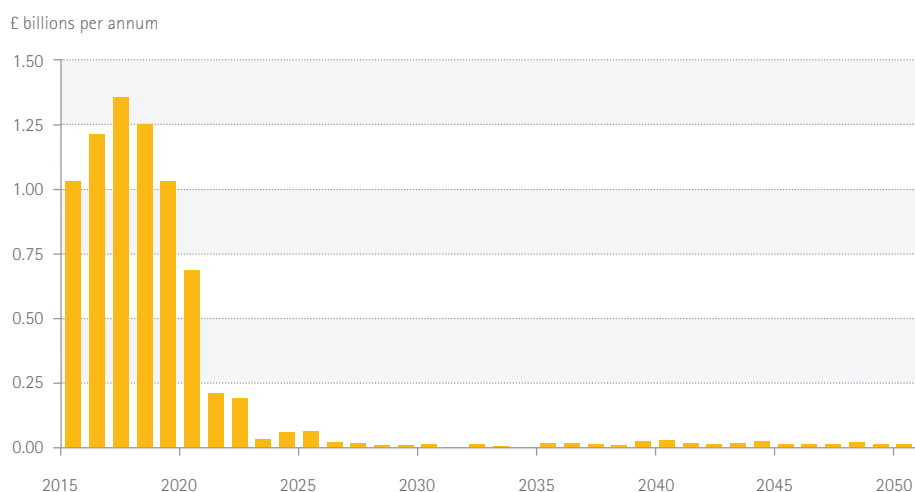


Source: Fathom Consulting

Figure 13 shows a projection for the breakdown of schemes into 'winners', 'fighters' and 'losers'. The proportion of 'winners' rises sharply in the early part of the simulation. By 2022, just over one half of all schemes, weighted by liabilities, will have reached a buyout level of funding. The proportion of 'winners' continues to rise so that, by 2030, more than 80% of schemes will have transferred their assets to an insurance company. Relatively few schemes fail in this scenario. By the end of our simulation, fewer than 5% of schemes will have transferred both their assets and their liabilities to the PPF. It is important to recognise, however, that Figure 13 is conditional on the expected path for gilt yields, and for asset returns, embodied in our OBR scenario. In a world where index-linked yields fail to return to pre-crisis levels, there would be far fewer 'winners' and far more 'losers'. On page 23 of this report, we briefly outline the consequences of an environment in which there is only a partial normalisation of yields.

3. Winners, fighters and losers on the road to buyout

Figure 14: s179 deficits transferred to PPF

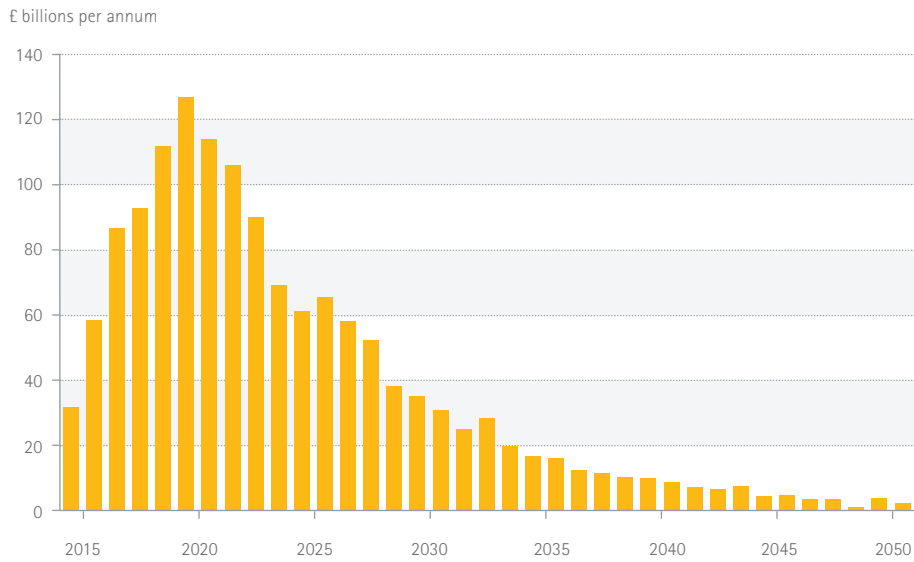


Source: Fathom Consulting

Of particular interest, both to regulators and to insurers, is the magnitude of the assets and liabilities held by the three types of scheme set out in Figure 13 (previous page). Figure 14 shows the expected difference between the aggregated s179 liabilities and the aggregated assets of all the schemes that 'lose' in each year. It is, in effect, a forecast of the aggregated s179 deficits that will be transferred to the PPF. According to our model, transfers are likely to run at around £1 billion per annum for the next five years or so. Beyond that point, transfers drop off sharply. Looking out to 2030, the expected cumulative level of s179 deficits transferred to the PPF is £7 billion. That is probably a little higher than the mean figure derived from the PPF's Long-Term Risk Model, and illustrated graphically in the 2014 Purple Book⁸. Figure 15 (opposite) records the expected market value of all assets held by schemes that win in each year. We find that transfers to insurers are likely to peak at £125 billion in FY 2019/20. By that time, in our OBR scenario, gilt yields will be approaching 4% and around one-third of schemes, weighted by liabilities, will have reached a buyout level of funding. In the next section we consider how the desired portfolios of the dwindling number of 'fighters', and the increasingly large number of 'winners' the assets of which are managed by insurers, are likely to evolve under our OBR scenario. As schemes mature and move towards a position of full-funding, the DB sector in aggregate can be expected to demand fewer equities and more fixed-income assets with a particular focus on index-linked gilts. How will this fit with the needs of a growing defined-contribution (DC) sector, fuelled by the government's auto-enrolment policy, and with net issuance by the UK's Debt Management Office (DMO)?

⁸ See chart 8.1 on page 64 of that report.

Figure 15: Assets held by schemes reaching annual buyout level of funding



Source: Fathom Consulting



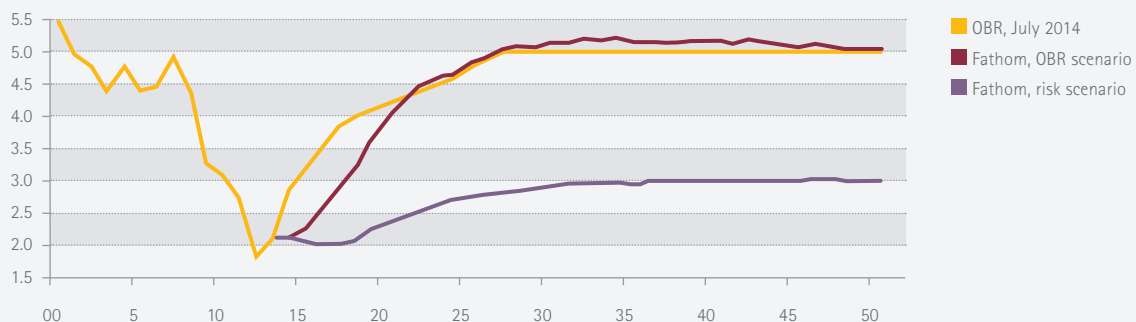
What if gilt yields stay low?

The OBR scenario, which sees yields return to pre-crisis levels over the next 10 years or so, is undoubtedly an attractive one from the perspective of trustees and sponsors alike. It would cure the deficit headache faced by many schemes. Indeed, with scheme funding improving so dramatically in the OBR scenario, deficit reduction contributions (DRCs) run at around a quarter of the level seen in recent years.

But what if both conventional and index-linked yields stay low? In this box, we describe an alternative scenario where policymakers keep interest rates even lower for even longer than is priced in, at the time of writing, by financial markets. Indeed, Fathom's latest UK forecast has the policy rate of interest remaining substantially below headline inflation for at least the next three years. In our risk scenario, conventional yields rise only very gradually towards 3% - see Figure A. In this environment index-linked yields barely rise above zero.

Figure A: Gilt yield

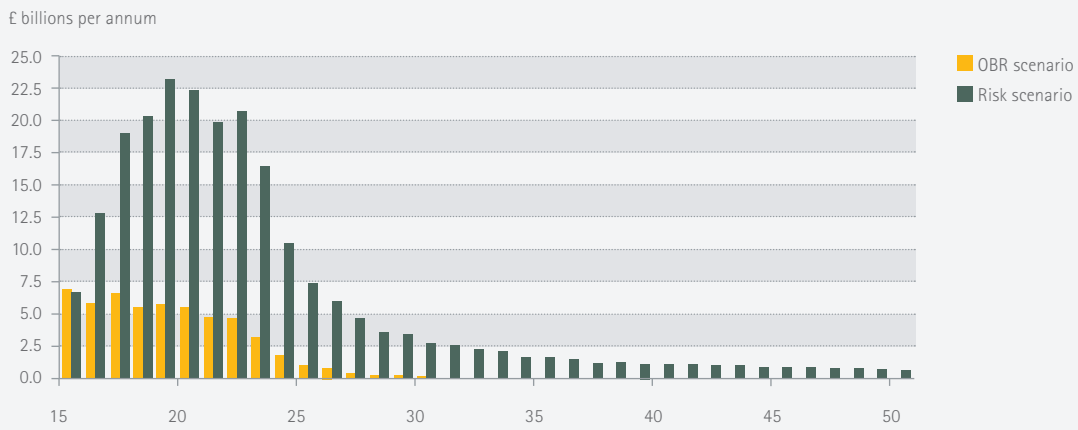
Weighted average on all conventional gilts, per cent



Sources: Office for Budget Responsibility / Fathom Consulting

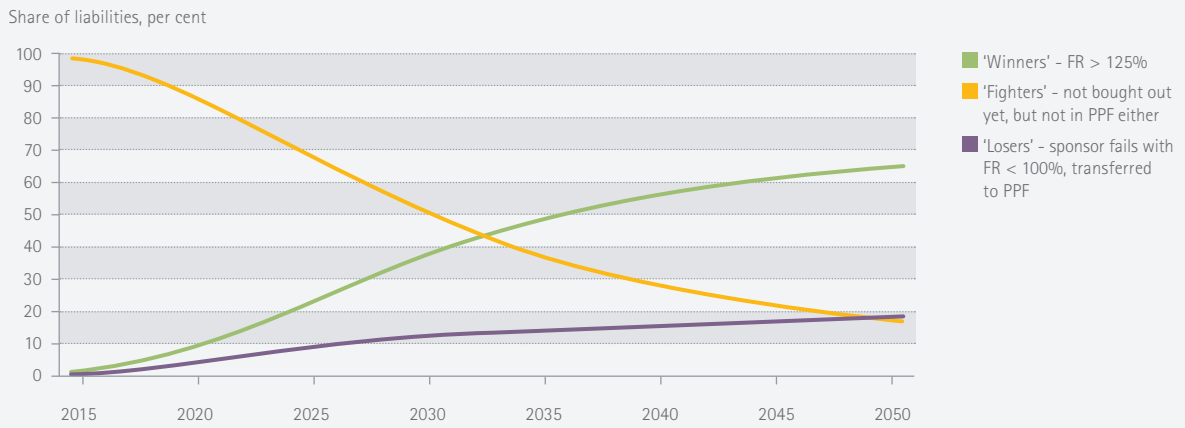
With scheme discount rates doing much less of the work in this scenario, the corporate sponsor has to do much more. Figure B shows that, if yields stay low, the need to close pension scheme deficits will continue to act as a considerable drain on company resources. In our risk scenario, the present value of DRCs is more than four times as large as it is in the OBR scenario. More DRCs means more company failures. In this simulation, we find that around one in five schemes will transfer both their assets and their liabilities to the Pension Protection Fund by 2050 - see Figure C.

Figure B: Deficit reduction contributions



Source: Fathom Consulting

Figure C: Scheme typologies through time, risk scenario



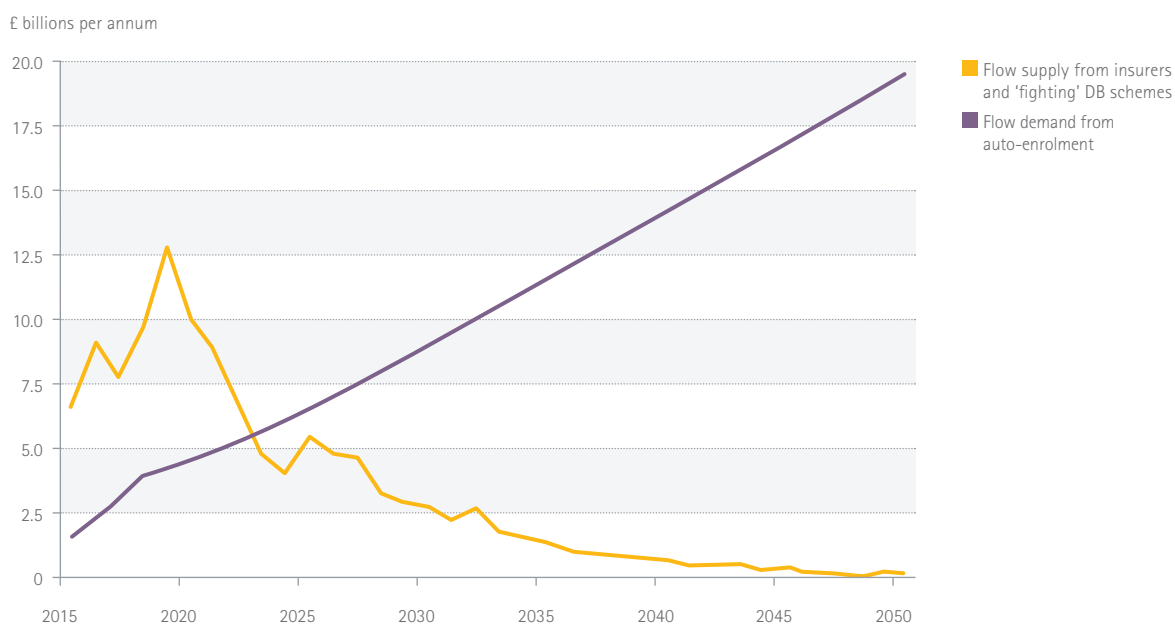
Source: Fathom Consulting

4. Implications for UK asset markets

In this section we assess potential imbalances between the net demand for and the net supply of UK equities and index-linked gilts stemming from the asset-allocation preferences of maturing DB schemes, and the burgeoning DC sector.

In order to assess the changing nature of the demand for assets from the maturing DB sector, we need to make an assumption about the actions of insurers once a scheme has been bought out. We imagine that the insurer proceeds as follows. On acquiring the assets of a 'winner', which by definition are equal to 125% of the technical provisions, the insurer seeks full protection by purchasing index-linked gilts that are sufficient to cover all of its inflation-linked liabilities⁹. It finances these purchases by selling a range of assets in such a way that the shares of the assets in the portfolio outside of index-linked gilts are preserved¹⁰.

Figure 16: Demand for and supply of UK equities



Source: *Fathom Consulting*

⁹ Alternatively, we might imagine that the insurer purchases derivatives to offer an equivalent degree of protection. Nevertheless, to the extent that the party issuing the derivatives is in turn likely to protect its inflation exposure by holding index-linked gilts, the net impact on the demand by financial market participants for index-linked gilts would be identical in each case.

¹⁰ It may help to provide a numerical illustration. Imagine that a scheme with £1.25 billion of assets is sold to an insurer. Imagine also that 70% of its liabilities are index-linked. That means, with total liabilities of £1.00 billion, it needs to hold £0.70 billion of index-linked gilts. It is currently holding just 20% of its assets, or £0.25 billion in this form. So it needs to swap £0.45 billion of its other assets for index-linked gilts. It does this by selling 45% of its holdings of all other assets.

We start by considering how the net supply of UK equities from maturing DB schemes compares with the net demand for UK equities from schemes acting on behalf of employees that have been auto-enrolled into a DC pension^{11,12}. According to government estimates, auto-enrolment, which began for the largest firms in October 2012, will bring an additional eight million employees into the pension net by October 2018, and total contributions made on their behalf will amount to £11 billion. We have used these government figures, together with an assumption that one-third of scheme assets are invested in UK equities, to derive a projection for the net demand for UK equities from these eight million newly enrolled employees. The projection is shown in Figure 16 (opposite) alongside a forecast for the net supply of UK equities from maturing DB schemes derived from our model. It suggests that the net demand for UK equities from newly enrolled employees is unlikely to match the net supply of UK equities from maturing DB schemes until the early 2020s. Excess supply is, however, comparatively small. Over the next five years, annual excess supply averages around £6 billion. That is just 0.3% of the market capitalisation of the FTSE All-Share at the end of September 2014. It transpires, however, that potential imbalances in the index-linked gilt market are much bigger.

Using our projections for the quantity of assets held by schemes that reach a buyout level of funding, shown in Figure 15 (page 22), together with the rules we set out above governing the behaviour of insurers as they receive those assets, we can derive projections for the net demand for index-linked gilts from the insurers of schemes that have just transitioned from 'fighters' to 'winners'. We must then add to that an estimate of the net demand for index-linked gilts from maturing schemes that are yet to reach a buyout level of funding – the 'continuing fighters', in our three-way typology¹³. This gives us a forecast for the total net demand for index-linked gilts from the DB sector. What is of interest to us is a comparison of this net demand with the net supply of index-linked gilts from the DMO.

In section 2 we explained why, according to the OBR's latest projections, the market value of all gilts is likely to peak within a year or two from now. For most of the latter part of this decade, and for almost all of the next decade, total gilt issuance is likely to be negative. If official forecasts for the primary balance, and for gilt yields, are to be believed, the government will be engaging in debt buybacks. What we do not know is how these will be split between buybacks of conventional and buybacks of index-linked gilts.

¹¹ With the vast majority of DB schemes now closed, having been replaced in most cases by an alternative DC scheme, over the next few years it is effectively auto-enrolled employees who will become the marginal source of pension savings.

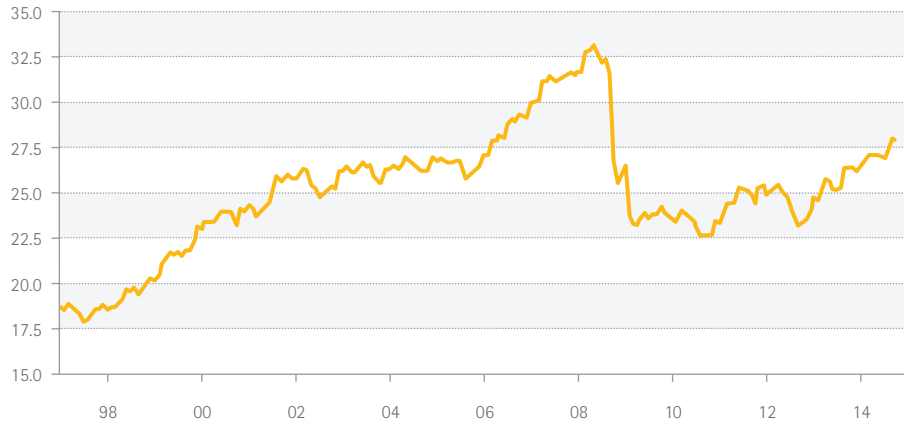
¹² Throughout this section, when speaking of a net demand for, or a net supply of a particular asset, we are referring explicitly to flows rather than to stocks. An investor's net demand for, or net supply of a particular asset is the change in his or her desired holdings of that asset from one period to the next.

¹³ As we set out in Appendix 2, we use data contained in the 2014 Purple Book to calibrate an investment rule that makes the investment in fixed-income assets of a 'fighter' an increasing function of the scheme's maturity and its funding position. For schemes that have yet to reach a buyout level of funding, the share of all fixed-income assets that are index-linked gilts is held constant at 40%.

4. Implications for UK asset markets

Figure 17: Share of index-linked gilts in stock of all gilts

By market value, per cent

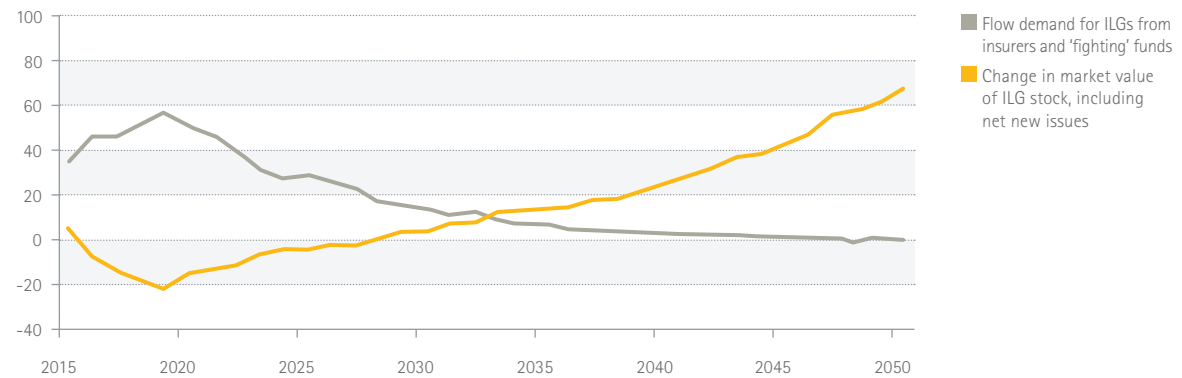


Sources: Thomson Reuters Datastream / Fathom Consulting

Figure 17 shows how, from the early 2000s, the DMO's actions with regard to buybacks and issuance have had the effect of returning the share, by market value, of index-linked gilts to around 25%¹⁴. In putting together the projections for net index-linked gilt demand, and net-index linked gilt supply shown in Figure 18, we assume that the DMO maintains this approach. So index-linked gilts account for 25% of any increase and 25% of any decrease in the market value of all gilts in circulation.

Figure 18: Demand for and supply of index-linked gilts

£ billions per annum



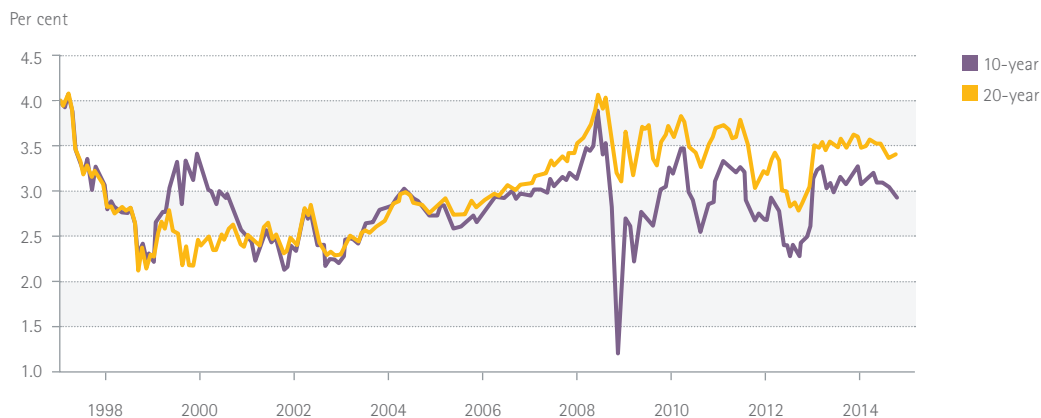
Source: Fathom Consulting

¹⁴ The increase in that share from around 25% in late 2005 to more than 30% by mid-2008 reflected a steady rise in breakeven rates that depressed the price of conventional gilts relative to the price of index-linked gilts. The sudden reversal in late 2008 was driven by a collapse in breakeven rates in the wake of the failure of Lehman Brothers Bank.

We find that if insurers seek to hedge in full the inflation-linked liabilities they acquire from 'bought-out' DB schemes, and if the UK economy and its financial markets evolve broadly according to the projections set out by the OBR in the July 2014 FSR, then net demand for index-linked gilts is likely to outstrip net supply until the early 2030s. According to our calculations, the magnitude of the shortfall of index-linked gilts will be substantial. As we set out in the preceding section, the value of the assets transferred to insurers is likely to peak in 2019. In that year alone, we expect the shortfall to be close to £80 billion. Looking over the next 10 years, the cumulative shortfall is likely to be more than £500 billion.

What are the options for policymakers? Essentially there are two. One is to do nothing. The other is to issue many more index-linked gilts, buying back existing conventional gilts and issuing new index-linked gilts in their place if net gilt issuance is insufficient to achieve the desired objective. It boils down to a relatively simple question: Who should carry inflation risk? Should it be left to the private sector, which in the case of sponsor failure may result in at least some of the risk being passed on to scheme members? Or is it a job for government?

Figure 19: Inflation breakevens



Sources: Thomson Reuters Datastream / Fathom Consulting

Let us imagine that policymakers do nothing. Under our OBR scenario, the inevitable consequence is that insurers holding the liabilities of 'bought out' DB schemes, together with the remaining DB schemes themselves, will be left with very little protection against unexpected changes in inflation. How big might these unexpected changes be? Breakeven inflation rates, calculated as the difference between the yield on conventional and index-linked gilts, provide one metric. Figure 19 shows 10- and 20-year breakeven inflation rates. These provide an estimate of the average rate of RPI inflation expected by investors over the next 10 and 20 years respectively.

4. Implications for UK asset markets

It suggests that expectations about inflation can shift quite dramatically. Inflation is, in other words, uncertain. In late 2008 the 10-year breakeven rate fell by almost five percentage points, while the 20-year breakeven rate fell by more than a percentage point as investors began to price in the risk of deflation following the collapse of Lehman Brothers Bank. More recently, in late 2012, both 10- and 20-year breakeven rates rose by 50 basis points or more, and have remained at a higher level ever since. We find that a 50 basis point increase in inflation that was not matched by an equivalent increase in yields would add some 10% to the liabilities of a typical scheme, potentially threatening the vitality of a mature scheme that has only a weak corporate sponsor, or indeed the solvency of an insurer.

Alternatively, policymakers may decide that, in order to ensure that the rights of DB scheme members are sufficiently protected against unexpected movements in inflation, the government should instead carry the inflation risk and issue more index-linked gilts. We find that, in order to cover the expected shortfall set out in Figure 18, it would need, within the next 10 years, to raise the index-linked share from 25% to 75%. Under our OBR scenario, where the market value of all gilts in circulation is set to be some £400 billion lower in 10 years than it is today, this could only be achieved by buying back existing conventional gilts and issuing new index-linked gilts in their place.

There is, in fact, a third option. All of our analysis to date has assumed that the UK economy, and its financial markets, evolve broadly according to the forecasts set out by the OBR in the July 2014 FSR. But it might not. Specifically, it might be objected that, in an environment where the demand for index-linked gilts substantially outstripped supply, index-linked yields would not rise. At the time of writing, the yield on the outstanding stock of index-linked gilts stood at -0.5%. With a growing imbalance between the demand for and the supply of index-linked gilts, index-linked yields might remain negative. Then, it could be argued, we are in a world of financial repression. We set out the consequences for DB schemes of continuing financial repression in our first report. And, from the perspective of corporate sponsors, and indeed the wider economy, they were not good.



Appendix 1: Fathom's Long-Horizon Asset Allocation model

Fathom's Long-Horizon Asset Allocation (LHAA) model simulates returns to seven broad asset classes. These are: cash; conventional government bonds; index-linked government bonds; UK equities; overseas equities; corporate bonds and commercial property. The asset return equations have been estimated using annual data that extend back as far as 1900. Restrictions derived from economic theory have been used to fix some of the long-run properties of the model. For example, it is assumed that ultimately the yield on conventional government bonds is given by the trend real rate of growth of the economy, plus inflation, plus an inflation risk premium – which by default is assumed to be equal to 50 basis points. The pace at which yields adjust to their long-run rate is largely data determined. The model also allows a role for Quantitative Easing.



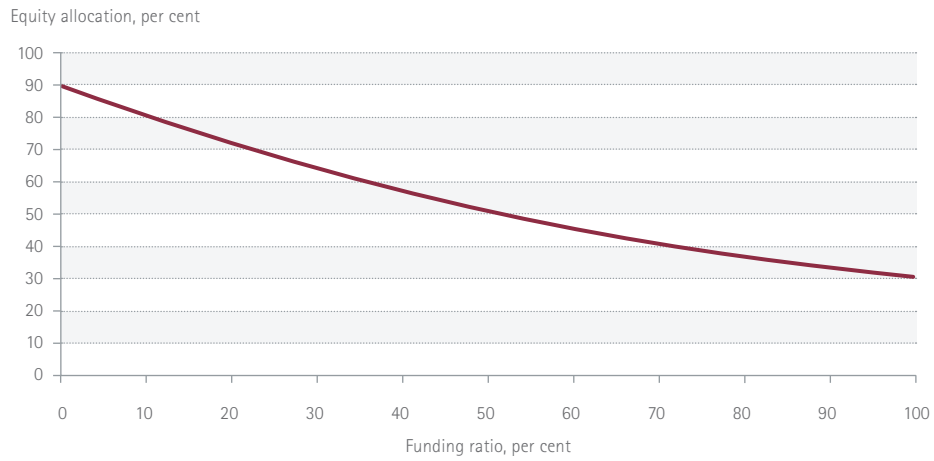
Appendix 2: Fathom's DB pension model

Fathom's DB pension model takes a bottom-up approach to the calculation of scheme liabilities. We assume that the sponsoring firm employs a mixture of male and female staff of all ages that is representative of the UK workforce as a whole, as measured by the Office for National Statistics (ONS). Active scheme members receive a level of pay commensurate with their age and their sex as reported in the Annual Survey of Hours and Earnings (ASHE). Each year, an active member of the scheme resigns from the firm with fixed probability q and becomes a deferred member. The parameter q was chosen so that, given a plausible set of mortality assumptions, the predicted mix of active members, deferred members and pensioners was representative of the national average as recorded in the Pension Protection Fund's (PPF) Purple Book for 2014. We assume that all benefits accrued since 1997 have been indexed to RPI under an LPI 0-5 rule. Finally, we assume that the scheme closed to new members in 2007. We took this decision on the grounds that, at that time, the proportion of DB schemes that were closed to new members was close to 50%.

For this report, rather than focus on just a single scheme, we have amended our model so that it comes closer to capturing the distribution of possible outcomes across all DB schemes. To achieve this, we have significantly increased the number of stochastic simulations that we compute so that, in addition to modelling the impact of uncertain asset returns, we are able to consider the prospects for a wide spectrum of schemes, including those that start out with both weak and strong funding positions. Specifically, we assume that initial funding ratios across all schemes are normally distributed, with parameters based on data provided in the PPF's Purple Book for 2014. Another significant change to our earlier model concerns the approach to asset allocation. In putting together our first report, we had assumed that the typical scheme would de-risk by moving out of equities and into gilts whenever it was on target to reach a position of full funding earlier than required by the Pensions Regulator. If it fell behind then it would re-risk by moving out of gilts and into equities. We have now amended this rule so that the assets held are a function not just of scheme funding, but of scheme maturity.

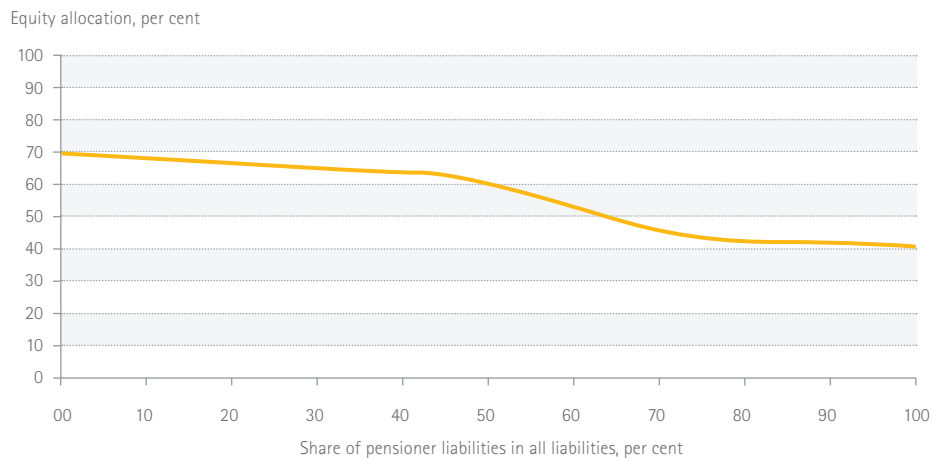
As with the initial funding ratio, we calibrate the asset allocation rule using data provided by the PPF. The Purple Book contains information on the portfolio of assets that are held by schemes with a funding ratio that falls into one of four ranges, and by schemes with a share of pension-in-payment liabilities in all liabilities that falls into one of five ranges. We used the method of polynomial regression to estimate two smooth decision rules. One makes the proportion of all assets that are allocated to equities a non-linear function of the funding ratio, while another makes the proportion of all assets that are allocated to equities a non-linear function of scheme maturity. The two rules are illustrated in Figures A2.1 and A2.2. Where the rules conflict, we make the proportion of all assets that are allocated to equities a simple average of the requirements of each rule. As the allocation to equities rises (falls) we assume it is the allocation to fixed-income that falls (rises) to offset. Data from the Purple Book suggest there is little systematic variation in the allocation to other asset classes in response to changes in funding and in scheme maturity.

Figure A2.1: Equity allocation as a function of funding



Source: Fathom Consulting

Figure A2.2: Equity allocation as a function of maturity



Source: Fathom Consulting

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