The impact of DC asset pooling: International evidence

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Foreword

Asset pooling in DC schemes has been limited to date with few benefits to the majority of members in the UK. However, we believe that learning from positive international DC pooling experience is an important milestone in the journey to improving outcomes for UK DC members.

The discussion around the perceived benefits of asset pooling for DC schemes frequently focusses on reducing charges as the primary means to improving member outcomes. Whilst not to dismiss this, following the implementation of the charge cap, many DC schemes in the UK already benefit from lower fees than the international plans considered in this report. What is clear however, is that UK DC pension schemes have fallen behind many of their international counterparts in their use of a wider range of asset classes. By pooling assets, improving governance and focusing less on daily pricing, we believe outcomes can be improved for UK members.

Following the lead of internationally established DC systems, more creative ways need to be found in the UK to facilitate investment in asset classes such as alternatives and illiquid assets alongside implementing a sustainable investing approach to better invest, improve and protect members' outcomes for the future.

Further, a large proportion of members in DC schemes are invested in the default. It is our view that that these default funds need further scrutiny as to whether the scale, investment approach and governance could be improved to benefit the members.

Schroders are delighted to have partnered with the Pensions Policy Institute in sponsoring this vitally important piece of research. We hope that you find the content and conclusions in this report valuable and informative.

Lesley-Ann Morgan,
Global Head of Defined Contribution and Retirement, Schroders

The impact of DC asset pooling: International evidence

Executive Summary

The Defined Contribution (DC) landscape in the UK is somewhat fragmented, with a large number of schemes and variation in quality across the market

In 2017 there are around 35,000 DC schemes (both trust and contract-based) in the UK. Around 90% of savers are members of schemes with more than 5,000 members, of which there are around 130. Around 90% of schemes (covering around 3% of members) have less than 12 members, although many, but not all, of these 'micro schemes' are Self-Administered Small Schemes (SSAS) or executive pension schemes in which many members are either trustees or directors of the company.

While the introduction of automatic enrolment has led to the creation of new master trusts, some of which are relatively large, for savers who remain in smaller, older or non-qualifying schemes, insufficient scale and governance practices may negatively impact their retirement outcomes.

In the UK, asset pooling has predominantly been discussed in relation to Defined Benefit (DB) schemes or the possibility for Collective Defined Contribution (CDC) schemes. International examples of asset pooling suggest that it may have the potential to improve member outcomes within a more traditional DC arrangement.

Areas in which pooling could potentially impact member outcomes include:

- Reduced administrative and/or investment costs;
- Implementation of improved governance practices on a scheme and fund level;
- The capacity to increase or access expertise, which also has the potential to reduce costs, as well as potentially leading to better returns and/or reduced volatility;
- Scope for greater portfolio diversification and access to alternative asset classes.

A 0.1% decrease in annual management charges (AMC) could only increase the size of members' pension pots at retirement by around 2.5%

Much of the discussion surrounding the benefits of consolidation has focused on charges, rather than investment returns, risk and volatility. While charges impact upon member outcomes, investment returns and levels of risk and volatility affecting these returns also have an, arguably more significant, impact. An increased focus on charges may occur for a number of reasons:

- Charges are easy to identify and compare, whereas it may be more difficult to calculate reliable measures of risk and accurately collate this with the way that it interacts with rates of investment return.
- There may be a perception that funds have a greater ability to influence charges than investment returns which are influenced by a range of external factors.
- Scrutiny of costs may increase when funds' investment returns are comparatively poor.[1]

1. Coleman, Esho & Wong (2003)

While average charges of DC funds in the international examples studied are higher than average AMC in the UK, a correlation between fund size and charges can be observed in all four countries. The correlation appears to be strongest in Australia, with some large funds with more than A$20 billion in assets under management (AUM) able to offer charge reductions of as much as 40-55% compared to smaller funds with between A$5 and A$20 billion AUM.[2] Similarly, in Mexico, the largest scheme, Afore XXI Banorte, has the lowest charges. Research on Italian DC funds shows a correlation between fund size and administrative costs, with the average charges of funds with less than 10 members around 0.16% higher than those of funds with more than 50 members and average charges in funds with more than €450 million AUM around 0.2% lower compared to funds with less than €150 million AUM. Investment charges in Italy, however, appear to be less correlated with fund size. In South Africa, there appears to be some correlation between fund size and lower charges among single-employer DC schemes, but large multi-employer umbrella funds generally have higher charges.

Because average AMC in the UK is already significantly lower than those of the other countries, at 0.46%, there may be less scope for UK DC schemes to reduce charges to the same extent as a result of pooling. However, a reduction in charges, even one smaller than those observed internationally, would positively impact member outcomes, all other things being equal. A 0.1% decrease in AMC could increase the size of members' pension pots at retirement by between 2.4% and 2.7%.[3]

Members of older legacy schemes could stand to benefit the most from increased asset pooling because:

- Charges within legacy schemes are often higher than the average
- Pension savings invested in closed legacy schemes are also more vulnerable to erosion by high charges as there are no new contributions being made, meaning that investment returns are the only source of income to the scheme.

Some legacy schemes have already recognised the benefits of pooling and transferred their members to larger schemes with lower charges. However, to date, certain regulatory barriers have made this a more difficult undertaking.

Increased scale could enable schemes to improve governance practices on a scheme and fund level

Increased scale can lead to improved governance at a scheme and fund level. Better governance leads to better outcomes. Research suggests that this 'governance premium' could be somewhere in the range of 0.35% to 1-2%, depending on the scheme's quality of governance prior to improvements and the strategies implemented to achieve improvements.[4] For example, a scheme that improves from 'moderate' to 'strong' governance would see less impact on outcomes than a scheme that improves from 'weak' to 'strong' governance. Similarly, the level of impact schemes are able to achieve through improved governance will be dependent on the strategies implemented.

2. Mercer (2016)
3. See chapter three for information on the individuals modelled and the impact of a decrease in AMC.
4. Willis Towers Watson (2016); Ambachtsheer (2007); Clark & Urwin (2010)

If asset pooling could enable schemes to achieve an increase in investment returns of between 0.35% and 1.5%, members' pension pots could increase by around 16% to 62%

International evidence of a correlation between fund size and performance is more mixed. There appears to be a correlation between fund size and a more diversified portfolio, but this does not seem to have translated to a clear link between fund size and returns. There appears to be some correlation in Australia, where in 2016, eight of the twenty largest funds were also ranked among the top twenty funds in terms of performance over a ten year period. However, this correlation is not absolute. Although the largest fund in 2016, AustralianSuper Balanced, was ranked 10th out of 91 funds for ten year returns, the second largest, CFS FC EMP – FirstChoice Moderate, ranked 68th in terms of performance.[5] Australian superfunds exhibited similar levels of correlation between fund size and performance in previous years also. In 2014 and 2015, the top ten performing funds in terms of ten year returns included, respectively, five and six of the top twenty largest funds.[6] In Mexico, there appears to be little correlation between fund size and performance, with one of the smallest schemes, Coppel, achieving significantly higher three-year total returns than the largest fund, Afore XXI Banorte, over the period 2013 to 2016, as well as achieving much higher levels of growth in total fund assets between 2012 and 2017.

Despite evidence of increased scale leading to improved returns being somewhat mixed, the improvements in governance and potential for diversification could help schemes to achieve better returns. If funds could achieve higher returns through greater asset pooling, all other things being equal, individuals' pension pot sizes at retirement would grow, which would impact their quality of life in retirement. An increase of 0.35% in investment returns would increase members' pension pots by 16% to 18%, while an increase of 1.5% in investment returns would increase their pots by 46% to 62% compared to the baseline scheme returns.[7]

The impact that pooling could have on member outcomes is largely dependent on the strategies schemes would implement in order to capture benefits of scale and improved governance

These gains are not certain and the magnitude of the impact that asset pooling could have on member outcomes is largely dependent on the way in which funds would implement their increased scale in order to access the benefits.

Options to achieve this include:

- Transferring into a larger scheme, which may also help to lower charges for members, particularly where charges within the original scheme are relatively high. Master trusts may be the main beneficiary of these transfers, although they are not the only option for smaller schemes looking to consolidate.
- Schemes may also seek to access benefits of scale through fiduciary management, with the manager acting in effect as a consolidator enabling access to a wider pool of assets which they may not be able to access directly.
- Some older, single employer GPP schemes and trust-based schemes may look to transfer members to more modern ones. Although this has the potential to help reduce charges, it may not impact investment mix and diversification as much.

5. SuperGuide (2016a)
6. SuperGuide (2015a); SuperGuide (2016b)
7. See chapter three for information on the individuals modelled and the impact of increased investment returns.

Regulatory requirements may act as a barrier to further consolidation

The Pensions Regulator (TPR) has acknowledged that the shift towards consolidation in the DC market that has occurred so far has now slowed, and it may be that there are some regulatory barriers to further consolidation.

Regulatory barriers include:

- The scheme must obtain consent from individual members in order to consolidate; or
- the requirement of an actuarial certificate; and
- conditions that must be met in the consolidating schemes' relationship to one another; for example, that the transferring scheme and the receiving scheme relate to individuals who are or have been employed by the same employer, or where this is not the case that the transfer is a consequence of financial transaction or partnership between the two employers.

Following on from the *Bulk transfers of defined contribution pensions without member consent*[8] review, in October 2017 DWP released a white paper (*The Occupational Pension Schemes (Preservation of Benefits, Charges and Governance) (Amendment) Regulations 2018)*[9] seeking views on draft regulations which would amend these barriers to consolidation. It proposes that:

- The need to obtain an actuarial certificate should be removed for 'pure' DC-DC transfers where there are no potentially valuable guarantees or options to be assessed; and
- The removal of the scheme relationship condition.

While the proposals would allow schemes to consolidate more easily, and as a result potentially deliver better outcomes for members, it is also important that the changes ensure that members remain adequately protected. As such, trustees would be expected to consider two aspects in particular:

- That the scheme is a well-run scheme, in which members' rights and benefits can reasonably be judged to be secure; and
- That the member outcomes will be of a similar or better standard than the ceding scheme.

Regulations are not the only potential barriers to DC schemes accessing the benefits of scale

The use of daily pricing in DC schemes may be discouraging increased allocation to more illiquid asset classes and is therefore a barrier to diversification. There is no regulatory requirement for schemes to use daily pricing, as opposed to a less frequent valuation method.

Daily pricing is primarily used in order to allow members to view accurate and up to date information of their pension savings, as well as to allow members to transfer in and out of funds at any time. However, the benefits of diversification that schemes may be foregoing as a result have the potential to affect member outcomes in a positive way. If the regulator wishes to encourage increased diversification among DC schemes, more may need to be done to precipitate a shift away from daily pricing to enable this. While daily pricing continues to be treated as a necessity by UK DC schemes, a significant allocation to alternatives is likely to be difficult.

8. www.gov.uk/government/consultations/bulk-transfers-of-defined-contribution-pensions-without-member-consent
9. https://www.gov.uk/government/consultations/bulk-transfers-of-defined-contribution-pensions-without-member-consent-draft-regulations

Regulators in other countries have encouraged, but not mandated, further consolidation, however progress has been somewhat slow

In 2012 the Australian pensions regulator, APRA, introduced a 'scale test' requiring trustees to consider the scheme's viability in improving outcomes for members, including assessment of the number of members and assets held within the fund. APRA has now proposed that the scale test will be expanded into an 'outcomes test' which takes a more holistic view of member outcomes. Consolidation among Australian superannuation funds has slowed somewhat in recent years. Some commentators have suggested that the regulator may need to take a more interventionist approach in order to force sub-scale schemes towards winding-up or consolidation, as further consolidation may not occur quickly enough if left to be driven by market forces alone. The Italian pensions regulator, COVIP, has also encouraged further consolidation, particularly for older closed pension schemes. As with Australia, the process of consolidation does not appear to happening as quickly as the regulator would hope. This raises the question as to whether regulators may have a larger role to play in directing sub-scale schemes towards consolidation.

Introduction

In recent years there has been much discussion concerning the benefits of pooling assets for investment, including economies of scale and better returns through access to different asset classes. However, in public policy terms, much of the debate has centred on Defined Benefit (DB) pension schemes, rather than Defined Contribution (DC). In particular, there have been policies implemented in the public sector Local Government Pension Scheme (LGPS),[10] and more recently asset pooling is one of the options raised in the Government's Green Paper on DB schemes.[11]

Consideration of asset pooling within DC schemes has mainly been within discussions surrounding Collective DC schemes, which involve broader sharing of risk between individuals. However, internationally, there are examples of investment pooling in more traditional DC arrangements. This report explores the potential impact that increased asset pooling and consolidation could have on UK DC member outcomes.

Chapter one describes the current DC market in the UK, outlining the starting point for any further consolidation and asset pooling, as well as identifying the types of schemes which may have scope to achieve the greatest impact.

Chapter two explores international examples of asset pooling and consolidation in DC pension funds in order to identify the impact that has resulted from increased scale. The international examples discussed in chapter two are: Australia, South Africa, Mexico, and Italy.

Chapter three discusses the potential areas of impact if asset pooling were to increase in the UK DC market, as well as the potential barriers to further consolidation.

Chapter four explores what the impact of asset pooling may be for individual scheme members. Three hypothetical individuals with varying characteristics are used to illustrate the magnitude of changes to pension pot sizes that could be achieved through consolidation and pooling.

Although this report focuses on the accumulation phase of retirement saving, asset pooling may also have the potential to offer benefits to member outcomes in post-retirement. Evidence on the impact of pooling in post-retirement is less easily available than that for the accumulation phase. This may be a potential area for further research.

10. For more information see PPI Briefing Note 79 *Recent developments in the Local Government Pension Scheme* www.pensionspolicyinstitute.org.uk/briefing-notes/briefing-note-79---recent-developments-in-the-local-government-pension-scheme-(lgps)
11. www.gov.uk/government/uploads/system/uploads/attachment_data/file/595103/security-and-sustainability-in-defined-benefit-pension-schemes.pdf

Chapter one: the Defined Contribution market in the UK

The UK Defined Contribution (DC) landscape has changed significantly in recent years. With more DC savers than ever before, and more risk falling upon individual DC members than under Defined Benefit (DB), providing value for money within schemes in order to achieve positive member outcomes has never been more important.[12] Partly as a result of the financial crisis, policymakers and schemes have begun to explore new options in order to achieve positive member outcomes. Contribution levels are key to achieving adequacy in retirement, but the potential for reducing charges, managing volatility and/or improved investment returns that might be achieved through pooling could help DC savers to achieve more positive retirement outcomes.

This chapter describes the current DC market in the UK, outlining the starting point for any further consolidation and asset pooling, as well as identifying the types of schemes which may have scope to achieve the greatest impact.

The UK's DC landscape is somewhat fragmented, with variation in quality and value across the market

DC has grown in importance in the UK in recent years, and there are now a greater number of active savers in DC schemes than in DB schemes

As the DB model became less attractive to private sector employers, the attractiveness of the DC model increased. As a result of both this shift and of the automatic enrolment policy, by 2015 the number of active savers in DC schemes overtook DB savers. In 2017, there are around 12.8 million active members in DC schemes compared to around 6.9 million active members in DB schemes (private and public sector combined).[13]

The DC market in the UK is complex and somewhat fragmented. There are currently around 35,000 DC schemes (including both trust and contract-based) in the UK, of which around 90% (32,000) are 'micro schemes' with fewer than 12 members. However, these micro schemes only account for a relatively small proportion of accounts (around 3%), and many are Small Self-Administered Schemes (SSAS) or executive pension schemes, in which many members are either trustees themselves or directors of the organisation. Members of such schemes are free to consolidate, transfer or wind-up should they wish to do so.

12. For more information on value for money and the way that it is defined see *PPI report Value for money in DC workplace pensions*
13. PPI Aggregate model

There are around 3,000 DC schemes with more than 12 members (covering 97% of accounts) and at present there are around 130 schemes with more than 5,000 members, comprising around 90% of accounts.[14] Master trusts have become more prevalent as a result of automatic enrolment, with 59% of auto-enrolees becoming members of these schemes.[15]

By 2035 there could be around 7.8 million people saving in master trust schemes

In 2017, there are around 12.8 million active members in DC workplace pension schemes. Around 5.8 million of these are in master trusts, around 3.5 million are in DC schemes which existed prior to automatic enrolment, and around 3.5 million are in new automatic enrolment DC schemes which are not master trusts.

Assuming current trends in scheme allocation continue, by 2035 there could be around 14.2 million active members in DC workplace pension schemes, with:

- 7.8 million in master trust schemes;
- Around 1.8 million in pre-existing DC schemes; and
- Around 4.6 million people in other automatic enrolment schemes.[16]

With a large number of smaller schemes, issues surrounding scale will continue to be important to many savers for years to come

Although discussion of the benefits that can be achieved through increased scale have primarily focused on the DB market, asset pooling could also affect the outcomes of DC savers, particularly those within small legacy schemes which are more likely to have higher charges and less capacity to diversify their portfolio. Delivering positive outcomes for scheme members requires good governance and a balancing of a number of factors, including:

- Returns;
- Volatility and risk; and
- Charges.

Average annual management charges (AMC) in the UK are relatively low compared to international levels and have decreased in recent years, although some funds continue to levy charges well above the average

In 2001, Stakeholder Pension Schemes (group personal DC pension schemes offered through a workplace) were introduced and with them, a cap on the charges these schemes could levy on scheme members. Initially the cap was 1% of assets under management, then increased to 1.5% for the first ten years of membership. Development in the DC pensions market and the introduction of automatic enrolment schemes have seen the average charge for new members reduce so that the norm for many DC private sector schemes is closer to 0.5% than 1.5%.[17] However, some older schemes still charge a relatively higher amount to members. Prior to automatic enrolment, the average charge for a contract-based workplace scheme was 0.95%.[18]

For default funds of automatic enrolment qualifying schemes, annual charges are currently capped at a maximum of 0.75%. The cap has been in place since April 2015 and has resulted in some schemes having to adjust their default investment strategy design, although the majority of master trusts and trust-based schemes already operated within the cap.[19] In some cases default funds achieve these lower charges by implementing a heavily passive investment strategy, which is less costly than active management.

The cap applies to all investment and administrative charges. Transaction costs (third-party costs generated when shares are sold and bought on the market) are excluded from the charge cap. While the charge cap has succeeded in reducing the average annual charge levied on DC workplace pension scheme members, for many older and non-qualifying schemes, charges remain higher.

14. TPR (2016a)
15. TPR (2017a)
16. PPI Aggregate Model
17. OFT (2013)
18. DWP (2012)
19. DWP (2015)

The average AMC for DC schemes in the UK is 0.46%.[20] However, some schemes continue to charge at a high level relative to the average, with many, particularly older legacy schemes exceeding the level of the cap.

Legacy scheme AMC are often higher than the average for all UK DC schemes

The cost of the ongoing maintenance of a legacy scheme can be considerable, especially if administration and investment are carried out by different third parties.

Following a 2013 Office of Fair Trading (OFT) market study into DC workplace pensions, an Independent Project Board (IPB) was established by the Association of British Insurers (ABI) to investigate the value for money offered by schemes that had been identified as 'at risk'. These schemes included all contract-based and bundled trust-based DC schemes[21] which:

- Were established on or before 5 April 2001;
- Were established on or after 6 April 2001 and have more than one type of charge; or
- Were established on or after 6 April 2001 where all the charges paid by members, excluding investment transaction costs, exceed 1% of any member's fund value in any given year.

The data, collected in April 2014, shows that of the £67.5 billion in assets under management (AUM) within the scope of the study, between £23.2 and £25.8 billion was potentially exposed to a reduction in yield (RIY) of more than 1% due to charges. Around half of the 'at risk' assets were in schemes established after 2001. Of the assets exposed to a RIY above 1%, around half (£13.4 billion) was exposed to a RIY above 1.5%, between £5.6 and £8.0 billion exposed to a RIY greater than 2%, and £0.8 to £0.9 billion to a RIY greater than 3%. Many of the individuals exposed to a RIY above 3% have relatively small pots of less than £10,000, of which more than 90% is held by paid-up members and members who are no longer making contributions to the scheme for whom a high RIY will significantly erode the total pension pot size at retirement.[22]

In 2015, a number of legacy schemes, with collective assets of around £10 billion, agreed to reduce their charges in order to comply with the 0.75% charge cap introduced from April that year (although the charge cap is not a legal requirement for these schemes). The following year a DWP and FCA review of industry progress against the IPB recommendations stated that schemes covering two thirds of the savings that had been identified as 'at risk' as a result of high levels of charges had reduced their charges to a level of 1% or less, or would shortly be doing so. However, 16% of AUM in contract-based DC schemes and 15% in trust-based DC schemes remains at risk of charges higher than 1%.[23]

Some legacy schemes have already recognised the benefits of pooling and transferred their members to larger schemes with lower charges. However, to date certain regulatory barriers, discussed further in chapter three, have made this a more difficult undertaking.

The shift from DB to DC has led to individual members taking on more risk, where it had previously been the responsibility of the employer

In DB schemes, the employer bears the investment, inflation and longevity risks. The member bears only the risk of insolvency, though there are mitigations, such as the Pension Protection Fund (PPF). Within DC schemes, members bear the investment, inflation and longevity risks. This means that members of DC schemes are generally less certain than members of DB schemes about the level of retirement income they are likely to attain.

As DC becomes important to an increasing number of savers' retirement outcomes, alongside contribution levels, appropriate investment strategy is a vital component in achieving adequacy goals. Slower growth in investment returns has led some schemes to adjust their investment strategy in recent years in order to achieve better returns, while attempting to minimise risk and protect members' pension pots from volatility caused by market shocks. However, insufficient scale

20. PLSA
21. Bundled trust-based schemes are schemes for which the majority of services are provided by a single provider, whereas unbundled schemes receive services via multiple service providers.
22. IPB (2014)
23. DWP & FCA (2016)

may be a barrier to smaller schemes accessing alternative asset classes that could help them to better manage volatility and deliver more positive member outcomes.

While smaller schemes are able to access some alternative asset classes by investing through pooled vehicles, in order to achieve sufficient scale to access these investments directly, some may need to consolidate.

Options to achieve this include:

- Transferring into a larger scheme, which may also help to lower charges for members, particularly where charges within the original scheme are relatively high. Master trusts may be the main beneficiary of these transfers, although they are not the only option for smaller schemes looking to consolidate.
- Schemes may also seek to access benefits of scale through fiduciary management, with the manager acting in effect as a consolidator enabling access to a wider pool of assets which they may not be able to access directly.
- Some older, single employer Group Personal Pensions (GPP) schemes may look to transfer members to more modern ones. Although this has the potential to help reduce charges, it may not impact investment mix and diversification as much.

Chapter two: international examples of Defined Contribution asset pooling

This chapter explores international examples of asset pooling and consolidation in Defined Contribution (DC) pension funds in order to identify whether these funds have achieved measurable benefits through increased scale and improved governance.

The international examples discussed are:

Australia is perhaps the most widely documented and discussed example of DC asset pooling, having introduced a compulsory superannuation system in 1992. Since then, the number of Australian superannuation funds has reduced through consolidation, while assets invested in the system have grown at a rapid rate.

South Africa has also seen consolidation in its pension industry in recent years, exemplified by the increasing prevalence of multi-employer umbrella funds. The increased scale of these funds does not appear to have translated into lower member charges, however there is some evidence to show a correlation between fund size, diversification and performance.

Mexico transitioned from a Government run pay-as-you-go pensions system to a funded DC system. Since its inception, the system has gone through the process of growth (in terms of number of schemes) before reducing down to the current level of 11 providers through consolidation. While there appears to be a correlation between fund size and lower charges among Mexican schemes, there does not appear to be any correlation between fund size and returns.

Italy has a highly concentrated pensions market, with 12 large funds comprising around 50% of the market. Despite high levels of concentration, private pension total assets under management are relatively low, which may mean that even the largest funds are not fully able to access benefits of scale.

A note on charges:

When comparing the annual charges of international pension funds to those of funds in the UK, it is important to recognise that some charges include more than others.

In the UK, Annual Management Charges (AMC) include the cost of the fund's management services, such as in-house research, analytics and portfolio management. However, AMC does not typically include the cost of third party services or less predictable factors such as performance fees and transaction costs.

Annual charges may be expressed differently internationally. For example, in Australia, superannuation fund charges are typically split into investment fees, which are charged as a percentage of assets under management (AUM), and administration fees, which are a standard weekly charge not dependent on the size of the member's pension pot.

In South Africa, pension fund charges are more varied, and may be based on: a percentage of salary/contributions; a percentage of AUM; a percentage of returns; or fixed level costs per member. This means that even a comparison of charges across South African pension funds may be comparing charges of funds that include more or less than others.

From the creation of the system in 1997 until 2008, Mexican pension funds were permitted to charge three types of management fees: a load factor (based on contributions), fees on the assets within the account, and fees on the accrued interest. In March 2008, regulation changed, with Afores now only permitted to charge a single management fee.

Similarly to Australia, Italian funds charge management fees, based on AUM, and a flat level 'membership fee' to cover administrative costs.

Comparison of charges throughout this report is intended to be illustrative in determining whether there is a correlation between scale and value for money within pension funds. Because of differences in the way that charges are calculated in different countries, they may not always be directly comparable to the UK.

Australia

- **1996 – 2017, 4,747 funds have reduced down to 233**
- **Assets have grown from A$262 billion to A$2,324 billion**
- **Funds with more than A$20 billion AUM account for almost 50% of total assets**
- **Funds with more than A$20 billion AUM can offer costs 40-50% lower than funds with AUM between A$5 and $20 billion**
- **2001 – 2016, allocation to domestic equities almost halved from 38% to 21%**
- **Allocation to alternatives more than doubled, from 2% to 10%**

The Australian superannuation system has evolved over the past 25 years

In 1996, there were 4,747 superannuation funds in Australia.[24] As of June 2017, there are just 233 APRA (Australian Prudential Regulation Authority) regulated funds, as funds have consolidated in order to access the benefits of scale, better investment management capabilities, improved returns and lower costs.[25] APRA regulated funds include corporate, industry, public sector and retail funds. However, there are still around 600,000 funds with fewer than 5 members that are not regulated by APRA, although these schemes account for only around 4% of the total number of accounts, similar to the level of micro schemes in the UK.[26]

Assets held within the superannuation system have continued to grow, totalling A$2,324 billion (around £1,380 billion)[27] at the end of June 2017[28], increasing significantly from just A$262 billion (around £155 billion) at the same time in 1996.[29] In 2004, there were just two Australian pension funds with over A$20 billion in AUM, which accounted for 12% of total assets within the superannuation system and 14% of members; by 2012, there were 11 funds with more than A$20 billion in AUM each, with aggregate funds totalling around 47% of total superannuation assets, as well as representing 46% of members.[30] Between 2005 and 2010 the average size of superannuation funds in terms of assets under management increased more than 300% from A$412 million to A$1,867 million.[31]

The Australian superannuation system is now one of the world's largest, both in terms of total assets under management and also in terms of its size relative GDP (130% in 2017).[32] It has a compound annual growth rate of 7.9% per annum for the 10 years ended December 2016, meaning that it is also among the fastest growing private pension systems in the world.[33]

24. Cohen, Ezra & Furlan (2011)
25. www.superannuation.asn.au/resources/superannuation-statistics
26. ASFA (2017)
27. All currency conversions to GBP are based on 2017 exchange rate. This is to ensure that variations in exchange rates do not affect the illustration of AUM growth.
28. ASFA (2017)
29. APRA (2004)
30. J.P. Morgan (2013)
31. Cummings (2016)
32. Clare & Craston (2017)
33. Vanguard (2017)

In Australia, there has been a shift in focus from considerations of nominal charge levels to assessment of the value and benefit provided to members

Rapid growth in assets under management, coupled with widespread scheme consolidation, can be attributed to a number of factors

In 1992, Australia introduced compulsion through the Superannuation Guarantee. This made it mandatory for all employees between ages 17 and 70 earning more than A$450 per month to contribute into a superannuation fund. At the same time, regulatory changes and policy directives have aimed to encourage consolidation of smaller schemes in order to achieve the benefits of increased scale.

In 2012 APRA introduced a 'scale test', as part of a wider set of 'Stronger Super' reforms, by which trustees should consider the scheme's viability in improving outcomes for members, including consideration of the number of members and the assets held within the fund. Funds were assessed across five areas considered to be vital in meeting the requirements of the regulator's scale test:

- Membership growth/loss;
- Net inflow/outflow ratio;
- Net benefit to member outcome;
- Fees; and
- Net operating expense ratios.

However, there was uncertainty around whether the scale test was the most appropriate way to assess whether member interests were being adequately protected as scale is not the only factor in this. As part of the Treasury Laws Amendment (Improving Accountability and Member Outcomes in Superannuation) Bill 2017, APRA has proposed that the 'scale test' will now be expanded into an 'outcomes test' which takes a more holistic view of member outcomes. This is characteristic of a shift within the wider Australian pension industry, with focus transitioning from considerations of nominal charge levels to assessment of the value and benefit provided to members.

The Australian Pension System

First tier

The Australian State Pension, known as the Age Pension, is means-tested, taking into account both income (from second tier superannuation savings and/or annuities, investments and paid work) and assets. The Australian State Pension age is currently 65 years and 6 months for those born 1 July 1952 onwards, but is set to increase in stages to 67 over the next 5 years. The maximum basic rate is currently $808.30 for single persons and $609.30 each for couples (per fortnight). An additional pension supplement may also be provided up to $65.90 single persons or $49.70 for each member of a couple (per fortnight).

Second tier

In Australia it is mandatory that all employers contribute to a superannuation scheme for all eligible employees. Eligible employees include those between the ages of 17 and 70 earning more than A$450 per month. Employee contributions are combined with employer contributions of 9.5% (2017, set to gradually increase to 12% after 2021) up to an annual cap of $50,000. In addition, employee contributions are matched by a factor of 1.5 additional up to $1,000 per year by the Government.

While the Superannuation Guarantee does not apply to the self-employed, around 30% of the self-employed make contributions, in part because of the available tax concessions.[34]

34. Clare & Craston (2017)

Although a significant amount of consolidation has occurred already in Australia, many feel there is still a long way to go

While consolidation has led to a rapid reduction in the number of superannuation funds, and as a result increased the assets under management within those schemes, smaller schemes still exist. More than a third of Australian superannuation funds have less than A$1 billion under management, with around 27% managing less than A$500 million.

Some of the small superannuation funds that remain may not have adequate scale to deliver positive outcomes for members. As of 2017, 44% of schemes with assets under management of less than A$10 billion have a negative cash flow with benefit payments exceeding contributions. A study of 140 superannuation funds found that around 23% (32) of the funds studied were unable to pass APRA's scale test, and should perhaps, therefore, be considering winding-up or finding a merger partner. Smaller funds with less than A$2 billion under management underperformed medium (A$2 billion to A$10 billion under management) and large (more than A$10 billion under management) funds in most areas.[35]

Consolidation among Australian superannuation funds has slowed somewhat in recent years

Around 70% of funds believe there will be further consolidation in the coming years, while just 13% expect their fund to be involved.[36] Although there is nothing inherently inconsistent between these two figures, as it could be that future consolidation is expected to involve a relatively small number of schemes, when taken in conjunction with the proportion of schemes having difficulty passing the scale test, this may suggests that some funds may not be accurately assessing their own viability.

APRA continues to voice concerns about the 'long tail of sub-scale funds' that continue to exist. Some commentators have suggested that the Regulator may need to take a more interventionist approach in order to force sub-scale schemes towards winding-up or consolidation, as further consolidation may not occur quickly enough if left to be driven by market forces alone. Within an increasingly challenging pensions landscape it may be that sub-scale schemes need to 'actively change to better meet the needs of members, or be changed by others who take the initiative from [them] in an uncertain world' which may mean consolidating with a partner who can provide greater scale, whether in administration, technology, investment, governance or communications.[37]

Australian administration and investment costs are generally higher than those of the average UK fund

Despite rapid consolidation and growth within Australia's superannuation system, annual fees have reduced only very slowly. In 2004, the average annual fee charged was 1.40%. Over the decade to 2013, this reduced to 1.20%, and again to 1.04% by 2015.[38] As of March 2017, the lowest superannuation charge offered was 0.46%, equal to the average UK AMC. The second lowest charge offered was higher at 0.63%.[39]

Larger funds with more than A$20 billion AUM can offer as much as 40-55% cheaper costs per member than funds with AUM between A$5 and A$20 billion.[40]

It is hoped that further consolidation will reduce charges further. The scale and outcomes tests aim to increase transparency around charges, meaning that funds will face greater scrutiny, particularly if their charges do not appear to offer value for money. Improvements in internal investment capabilities may also help to reduce charges by reducing third-party investment costs. However, it is important that the aim of reducing charges does not overshadow the fundamental aim of pension funds: to provide adequate income for members in retirement.

35. SuperRatings (2017)
36. Mercer (2017)
37. Mercer (2017)
38. Rice Warner (2014); SuperGuide (2015b)
39. SuperGuide (2017a)
40. J.P. Morgan (2013)

"In the majority of cases, the funds with the lowest fees do not necessarily provide a better retirement outcome or return for its members … Fees are, at best, only loosely correlated with value and any assessment of a superannuation fund should be made using a broad range of criteria, with 'net benefit' (investment returns less all implicit fees and taxes) being the only meaningful basis for comparison of fees and performance."

Adam Gee, CEO, SuperRatings[41]

In some cases, a race to the bottom in terms of charges can compromise other functions of the scheme and negatively impact member outcomes. This has been observed in Australia, with some funds achieving a reduction in charges simply by shifting their entire portfolio from being actively managed to a fully passive, index approach. There are arguments to be made in favour of both active and passive management, and the two should not be viewed as mutually exclusive, however a fund that implements a fully passive strategy may be more vulnerable to market shocks and times of increased volatility, increasing the potential for negative impact on member outcomes. Other funds have been shifting their portfolio away from passive management as a result of uncertainties about the interest rate outlook.[42] This links back to the shift in focus from costs to a holistic view of the value and benefit provided in member outcomes.

In 2015, a study of 162 superannuation funds, covering a ten year assessment period, found little correlation between the level of charges and the fund's performance in terms of net benefit to members (Table 1).[43] This is a lesson that can be applied within the UK context when considering pooling. Particularly when charges are already relatively low, a reduction in charges is not the primary factor in improving member outcomes. However, among the top ranking funds in terms of net benefit (Funds D, E and F), all were in the lower half of the fee ranking and all were ranked within the top ten in terms of earnings ranking. This means that they achieved better earnings and net benefits for members than the 50% of funds with higher charges, suggesting that high charges are not correlated with higher rates of return.

Table 1: comparison of top three superannuation funds in terms of fees and net benefit to members[44]

Fund	Fees	Fee ranking	Earnings	Earnings ranking	Net benefit	Net benefit ranking
A	$3,898	**1**	$67,148	96	$63,250	41
B	$5,162	**2**	$68,436	83	$63,274	39
C	$5,256	**3**	$65,038	103	$59,782	74
D	$6,699	16	$79,008	10	$72,309	**3**
E	$7,258	36	$87,126	2	$79,598	**1**
F	$10,549	78	$84,525	7	$73,976	**2**

41. SuperGuide (2015b)
42. Reuters (2016)
43. SuperGuide (2015b)
44. SuperGuide (2015b)

As the superannuation system has grown, asset allocation strategies have changed

Between 2001 and 2016, the proportion of superannuation investments allocated to each asset class has changed considerably. Allocation to domestic equities almost halved from 38% in 2001 to 21% in 2016, and this reduction has not resulted in a corresponding increase in the allocation to international equities, which has stayed relatively constant (25% in 2001 vs. 24% in 2016). Allocation to alternatives increased fivefold from 2% to 10%.[45]

Alternatives, including hedge funds, commodities, infrastructure, private equity and venture capital, now represent the third largest asset class in Australian institutional balanced investment portfolios. Larger funds generally have a higher allocation to alternative asset classes than smaller funds.[46] The largest superannuation fund, AustralianSuper, has an allocation of more than 20% to property and alternatives.[47]

"In Australia we see growing interest in alternative investments with some investors increasing their strategic asset allocation targets to private equity, real estate and infrastructure in the search for income returns, potential inflation linkage and diversification benefits."

Dania Zinurova, Towers Watson Australia Research Diversifying Strategies Manager[48]

There is a correlation between Australian superfunds' investment fees and their asset allocation, with funds that charge higher fees having a greater allocation to alternative asset classes such as hedge funds, private equity and infrastructure. High allocation to alternative asset classes may, therefore, be partly responsible for high charges among superfunds. There is also a correlation between investment fees and after-fee returns, with high fee funds on average producing higher returns than low-fee funds. However, when returns are adjusted for benchmark indices and asset pricing factors, there is no clear relationship between charges and performance.[49]

Some funds have attempted to reduce the cost of investing in alternatives by insourcing management of these assets. Insufficient scale is, however, considered a barrier to increasing internal investment management capabilities. In a study of twenty superfunds, 16 identified scale as an important consideration when making decisions to manage assets internally, although there was not consensus on the level of scale necessary to make this a feasible option. At the lower end, some participants thought that in-house management of assets could be considered in funds with AUM of A$5 billion or more, while at the upper end, participants thought that for funds with more than A$50 billion internal management of assets may become nearly inevitable as a result of potential cost savings and capacity considerations.[50]

Daily pricing of DC funds may also be a barrier to increased allocation to alternative asset classes. In the UK all DC schemes operate under the daily pricing regime. In Australia, however, some funds use weekly pricing, and where there is investment in alternative asset classes which are valued less frequently than listed assets, superfunds use the previous value for the asset until an updated pricing is available.[51]

45. UBS (2016)
46. Inderst & Della Croce (2013)
47. Reddy (2016)
48. SuperReview (2015)
49. Ainsworth, Akhtar, Corbett, Lee & Walter (2016) Superannuation fund data used in the study sourced from fund surveys collected by Chant West. The sample covers annual data for the period from 2007 to 2015 for 174 investment options within 49 super funds.
50. Gallagher, Gapes & Warren(2017)
51. SuperGuide (2017b)

There is some correlation between fund size and performance among Australian superannuation funds

As of 2016, among the 20 largest Australian superannuation funds, eight were also among the top 20 funds in terms of performance over a ten-year period.[52] This suggests there may be some correlation between size and performance but not a strong correlation. On average, larger funds with AUM in excess of A$50 billion are not outperforming smaller funds with AUM less than A$2 billion.

On average, medium sized funds are outperforming the larger funds (Table 2). As of January 2016, the median returns for funds with AUM between A$10 and A$20 billion exceeded those of funds with more than A$50 billion AUM for all time periods, as well as exceeding those of funds with between A$20 and A$50 billion for all but the ten-year period. In some cases scale does appear to be somewhat correlated with performance. The largest fund, AustralianSuper Balanced, was ranked 10th of 91 funds for ten year returns, and 8th of 119 funds for five year returns. Similarly, the third largest fund, QSuper Balanced, was also ranked 10th for ten year returns, and 1st in terms of five year returns. However, other funds among the largest have achieved less success, with the second largest fund, CFS FC EMP – FirstChoice Moderate, ranked 68th and 99th for ten and five year returns respectively.[53] Australian superfunds exhibited similar levels of correlation between fund size and performance in previous years also. In 2014 and 2015, the top ten performing funds in terms of ten year returns included, respectively, five and six of the top twenty largest funds.[54]

Table 2: median returns by total fund size (January 2016)[55]

Size	1 year	3 year	5 year	7 year	10 year
<$2 billion	0.0%	8.1%	7.2%	8.1%	5.1%
$2 - $5 billion	0.6%	7.6%	6.9%	7.6%	4.4%
$5 - $10 billion	0.6%	7.4%	6.8%	8.1%	4.8%
$10 - $20 billion	**0.8%**	**8.4%**	**7.4%**	**8.7%**	5.1%
$20 - $50 billion	-0.1%	7.3%	7.0%	8.1%	**5.3%**
>$50 billion	0.1%	8.1%	6.6%	8.1%	4.2%

52. SuperGuide (2016a)
53. SuperGuide (2016a)
54. SuperGuide (2015a); SuperGuide (2016b)
55. SuperGuide (2016a)

South Africa

- **2005 – 2017, 13,000 funds have more than halved to 5,000, only 40% of which regularly receive contributions or make payments to members**
- **Although charges are high, some larger funds have benefited from increased scale and achieved charge rates closer to the UK average**
- **Larger funds are more likely to be invested in alternatives and private equity, although small schemes reference unfamiliarity with the asset classes as a main barrier rather than insufficient scale**

There has been significant consolidation in the retirement industry in South Africa over the last decade

In 2005, there were around 13,000 registered retirement funds in South Africa. As of 2017, this has decreased to around 5,000 funds. This is broadly comparable to the consolidation that has occurred so far in the UK, with the number of DC trust-based schemes with more than 12 members decreasing from more than 4,500 in 2009 to less than 2,500 in 2017. However, only around 40% of these funds regularly receive contributions or make payments to members, meaning that in practice there are only around 2,000 active funds.[56] This increase in the number of dormant funds (funds with assets and/or liabilities which have ceased to conduct regular pension fund business such as receiving contributions or making payments to members) has resulted primarily from the shift from single-employer occupational pension funds towards umbrella funds. Umbrella funds are similar to UK master trusts as they cover members from multiple employers.

The total value of assets within these funds is R4 trillion, which is equivalent to around £220 billion (September 2017). These assets are increasing at a rate of around 15% per year.[57] With around R83 billion AUM, the largest South African fund is around 80,000 times larger than the smallest fund in the industry.[58] Membership has also been increasing, albeit at a slower pace.

The South African Pension System

First tier

The State Pension in South Africa is non-contributory. This is because many people within the country are either unemployed or work informally, so would be unable to contribute to the system and would likely fall into poverty during retirement. However, the South African State Pension is considerably less generous than State Pension in the UK, with the poorest retirees receiving between 9 and 10% of the average worker's income. In South Africa the primary purpose of the pension system is to alleviate extreme poverty, rather than to provide a replacement rate of working-life earnings.

Second tier

As in the UK, the majority of private sector employees in South Africa are members of Defined Contribution schemes, while public sector funds are still predominantly Defined Benefit. Where they are available, membership of occupational schemes is relatively high, not least because for some professions, employers can make membership mandatory in return for tax benefits. However, the second tier of the South African pension system is largely limited to certain sectors of society.

56. South Africa Financial Services Board (2017)
57. South Africa Financial Services Board (2017)
58. Van Andel (2014)

Although South African pension fund charges are generally relatively high, some larger schemes have been able to offer charges closer to UK levels

In some cases, there is a correlation between fund size in terms of AUM and the level of annual charges in South Africa. In 2014, average annual charges for domestic balanced funds with less than R50 million AUM was around 0.76%, while average charges for funds with more than R500 million AUM was around 0.69%.[59] However, umbrella funds tend to be more expensive, with the average charge around 2% per year.[60] The higher level of charges levied by umbrella funds is sometimes masked by a lack of transparency. Umbrella funds commonly charge three transparent tiers of fees:

- Administration fees;
- Consulting fees; and
- Management fees.

However, there are often other charges which are less transparent. Umbrella funds offering a single, transparent charge to members are gradually becoming more common.

Some South African pension funds are reducing costs by shifting the bulk of their investment to passively managed funds, while maintaining actively managed 'satellite' portfolios.

In South Africa, larger funds are more likely than smaller funds to be invested in private equity

Around 80% of large funds with more than R35 billion AUM are invested in private equity. For funds with between R25 and R35 billion AUM this falls to around 75%. Although some smaller schemes are invested in private equity, they are a minority among schemes of their size. However, schemes that are not invested in private equity are more likely to cite unfamiliarity with the asset class as the main barrier, rather than insufficient scale.[61]

Evidence on the relationship between fund size and performance among South African funds is mixed

Some studies find a positive correlation, with larger funds outperforming smaller funds, while others suggest the opposite, with the underperformance of larger funds largely attributed to constrained liquidity compared to smaller funds.[62]

For example, in 2017, the 10 largest unit trust funds all fell within the top 25% of funds in terms of average returns.[63] While investment strategy, rather than size, is thought to be a more important factor in determining fund performance, increased scale could create opportunities for implementing a more sophisticated investment strategy at a lower cost, thus maximising potential returns.

Increased scale is often discussed primarily in terms of the benefits it can provide, but in South Africa, the debate centres around the liquidity constraints that scale can impose on larger funds. Because large funds have more assets to invest, limited availability of particular asset classes may constrain their investment strategy and force them to hold positions in shares they would not necessarily have held if their AUM had been lower.[64] However, this issue is largely linked to South African regulations restricting allocation to international assets, and would therefore be unlikely to occur in the UK market.

59. Alexander Forbes (2015)
60. Moneyweb (2016)
61. SAVCA (2016)
62. Pillay, Muller & Ward (2010)
63. Du Preez (2017)
64. Van Andel (2014)

Mexico

- **11 schemes, each with funds divided and invested according to member age**
- **1998 – 2013, allocation to government securities has fallen from 97% to 51%**
- **Average fees have decreased by around 0.7% since 2008**
- **No clear correlation between fund size and returns, with largest afore ranked 10th out of 11**

The Mexican pension system has grown in recent years as a result of the shift from a pay-as-you-go state run system to a fully funded privately run system

In 1997, the Mexican Government introduced a mandatory DC system, with schemes managed by private pension fund administrators known as Afore. Prior to the 1997 reforms, the Mexican pension system was comprised of a pay-as-you-go DB scheme run by the State. Since 2008, each Afore has been allowed to offer five different funds, known as Siefore, with different types of investment strategies and risk levels based on fund members' time until retirement.

AUM have increased at a fast pace since the move to the new system, more than doubling between January 2010 and January 2016, from MXN 1.2 trillion (around £47 billion) to MXN 2.6 trillion (around £103 billion), with a compound annual growth rate of 16.7%, more than five times faster than average GDP growth over the same period.[65]

The Mexican Pension System

First tier

The public pension system in Mexico is comprised of a non-contributory scheme called the Pension for the Elderly (Pensión para Adultos Mayores), which is funded by the federal budget. It was introduced in 2007 and initially provided a pension to all individuals aged 70 or over who lived in towns with a population of less than 30,000. In 2012 it was extended to the whole country for those who did not receive a minimum amount of retirement income from any social security institution. From 2013 onwards, the programme was extended to cover all individuals aged 65 or over. Some states have their own non-contributory scheme in addition to the federal Pension for the Elderly.

Second tier

The Retirement Savings System (SAR) is a mandatory Defined Contribution system which is divided into 11 pension schemes known as Afore. Regulation mandates that each Afore must have at least four Siefore (funds) for investing compulsory contributions. The basic Siefore are divided according to members' age: up to 36 years old; between 37 and 45 years old; between 46 and 59 years old; and 60 years old or older. Afore may also offer a fifth fund for voluntary savings contributions.

65. EMPEA (2016)

Over the twenty years since its creation, the Mexican pension system has experienced both expansion and consolidation. In 1997, there were 17 Afore and in 2017 there are 11. In this time, the number of Afore grew to a peak of 21 in 2006 and 2007, before the process of consolidation led to a rapid decline in subsequent years (Chart 1).[66]

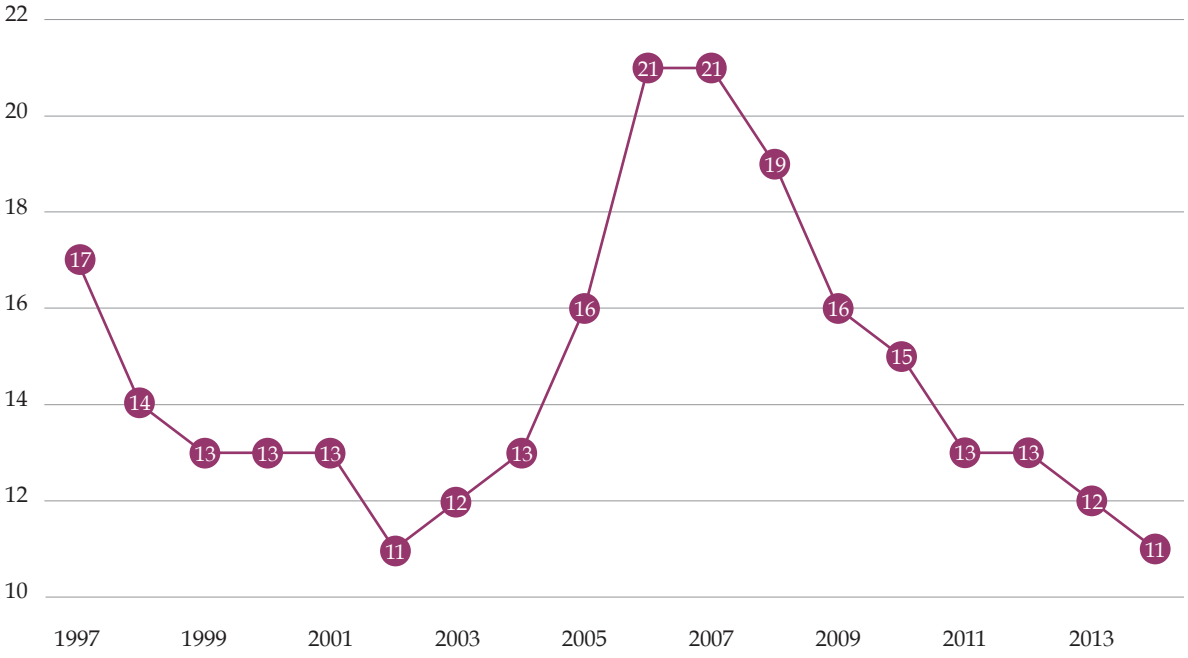
Afore XXI Banorte has been one of the main participants in this consolidation process. Now the largest pension administrator in Mexico, it has absorbed five other providers since 2009. It now covers around a quarter of the total number of accounts and AUM in the system. As well as creating the largest pension scheme in the country, these mergers have delivered measurable benefits for individual members, including reducing charges to the lowest level in the Mexican market, currently charging 1% in 2017. XXI Banorte has also used its increased scale to explore alternative investment strategies, and in 2016 introduced an internal benchmark and implemented best practice procedures in its external manager selection process for alternative assets.

As investment regulations have been relaxed, diversification among Mexican pension funds' portfolios has increased

Strict investment restrictions may have limited Mexican pension funds' capacity to grow assets and invest for the long-term. In 1997, when the privately managed Afore system was first introduced, there was only one authorised portfolio and most of its funds had to be invested in Government bonds. Until April 2005, investment in international assets was not permitted. These restrictions on investment may be partially responsible for the low correlation between charges and rates of return.[67]

Chart 1: Afore growth and consolidation 1997 to 2014[68]

The number of Afores has varied over time



66. amAfore (2014)
67. Aguila, Hurd & Rohwedder(2013)
68. amAfore (2014)

"For the system to deliver better pensions to our clients, we need to continue driving for the easing restrictions on [the diversification of] asset classes. The biggest priority is the limit on foreign assets, then alternatives and the equity limits. The easiest by law would be the alternatives space. We are seeing that and getting good feedback from the regulator, which has increased our appetite for alternatives."

Luis Sayeg, CEO, AFORE Banamex[69]

In recent years investment regulations have begun to be relaxed in Mexico, allowing for increased diversification. CONSAR, the Mexican pension regulator has increased the allowed allocation to alternatives by creating separate limits for real estate and infrastructure. In 2017, the regulations governing investments were amended to encourage the Afores to invest in productive projects, for example an extension of investment limits in structured instruments. 2017 has also seen 5 more countries (Malaysia, New Zealand, South Africa, Thailand and Taiwan) added to the list of countries eligible for Afore investment, taking the total number of eligible countries to 49.[70]

In January 1998, shortly after the establishment of the new system, Government securities accounted for 97% of Mexican pension funds' asset allocation. By September 2005 allocation to Government securities had decreased to 82%, and in September 2013 it had fallen to 51%.[71]

The regulatory maximum for allocation to foreign assets is 20% in 2017, and 71% of the funds allocate between 11% and 20% of their portfolios to foreign assets.[72] Despite increased diversification and a reduced reliance on Government securities, Mexico's pension funds' portfolios are still highly concentrated in debt instruments – around 80% compared to an OECD average of 55%.[73] Investment in equity is near its regulatory limits, while investment in alternatives such as infrastructure and real estate projects consistently falls around 10% below the regulatory limit.[74]

With Mexican funds achieving relatively high returns on average, it remains to be seen if a further relaxation of investment regulations will lead to further improvements in returns, or whether funds will maintain their current strategic allocations.

However, regulations restricting investment to certain asset classes may not be the only factor discouraging Mexican pension funds from increased allocation to alternatives. Members transferring, both between different providers and moving between funds within the same provider as they increase in age, means that it is important for funds to maintain a certain level of liquidity.[75]

As well as regulatory restrictions directly limiting diversification strategies, they have also acted as a barrier to developing expertise in the management of international assets, which has in turn further discouraged allocation to non-domestic and alternative assets. Nevertheless, diversification is viewed by many Mexican pension funds as fundamental to the pursuit of better returns and reduced risk and volatility.

Investment in alternative assets remains low among Mexican pension funds but this looks likely to change

In 2015, alternatives accounted for just 5% of Mexican pension fund portfolios. This looks likely to change, with 71% of Mexican pension funds saying they are 'very likely' to invest in domestic infrastructure vehicles in the near future, compared to 41% of pension funds globally.[76]

69. Blackrock (2015)
70. FIAP (2017)
71. CONSAR (2013)
72. Blackrock (2015)
73. OECD Pension Statistics
74. CONSAR (2013)
75. Morales, Fuentes, Searle, & Stewart (2017)
76. Blackrock (2015)

Where Mexican pension funds do allocate to alternative assets, they are more likely to be invested in real estate, private equity, private debt and infrastructure equity than infrastructure debt and commodities, although Mexican funds are still less likely than other global funds to invest in real estate.[77]

The correlation between fund size and reduced charges among Mexican pension funds is clearer than a correlation between fund size and improved returns

Mexican fund charges are relatively high across the board. In 2015, the average annual fund charge for Basic Siefore was 1.09%, having reduced around 0.7% from 2008, when regulation changed and funds were no longer permitted to levy three separate management charges.[78] As previously identified, the largest Afore, XXI Banorte, is also the cheapest; it is not, however, the best performing scheme in terms of growth. Between December 2012 and June 2017, XXI Banorte's AUM increased by 29% to MXN690 billion, while the assets of the two smallest Afores, Azteca and Coppel, increased by 394% and 156% respectively; some of XXI Banorte's growth during this time is as a result of its acquisition of BBVA Bancomer in 2013.[79] The higher level of growth achieved by these smaller schemes is the result of better investment returns (Chart 2).[80] There appears to be no correlation between AUM and size among Mexican Afores.

Chart 2[81]

Mexican schemes display little correlation between AUM and returns

A comparison of three year total returns (non-annualised) (2013-2016) against schemes' assets under management (2017)

77. OECD Pension Statistics
78. OECD Pension Statistics
79. CONSAR (2017)
80. Hanono (2016)
81. Hanono (2016); CONSAR (2017)

Italy

- **Highly concentrated market – 12 larger funds, with more than 100,000 members each, make up 50% of the market**
- **Average charge 1.42%, but larger funds with more than €450m AUM charges nearly 0.2% lower than funds with less than €150m**
- **Low levels of AUM in the private sector pensions system as a whole may be limiting schemes' ability to fully access benefits of pooling**

The Italian pensions market is highly concentrated, with 12 larger funds, each with more than 100,000 members, comprising nearly 50% of the market, while around 270 smaller funds with fewer than 1,000 members have a joint share of just 1%.

Virtually all Italian pension schemes are DC, as this is the only form permitted for new schemes, although a small number of DB schemes remain.

As with other international markets, Italian pension fund assets have grown considerably in recent years. In 2001, the combined AUM of Italian DC schemes was around €6.3 billion (around £5.6 billion). By 2015, AUM of Italian DC schemes had increased to around €32 billion (around £28.4 billion).[82]

The Italian Pension System

First tier

Italy's public pension system comprises of a compulsory notional DC scheme to which all workers contribute. At retirement, it is calculated how much would have theoretically built up in the scheme based on contributions, and the total sum is converted into an annuity. Both private and public employees contribute 33% of their salary, with their employer contributing around two-thirds of this. For those who do not contribute enough to reach minimum level of retirement income, there is also means-tested social assistance.

Second tier

Because the first tier of the Italian pension system has traditionally been generous, engagement with second tier pension saving has been low. In 2013, occupational pension schemes covered just 7.5% of the working population. However, participation has been rising, in part because of changes to the Trattamento di Fine Rapporto (TFR). This is a form of termination indemnity payment which is paid to employees who exit paid work for any reason. Assuming they have built up benefits throughout their working life, they receive 10-15% of their final pay as a lump sum. As a result of recent reforms, TFR is now paid into an occupational pension scheme, rather than held on the employer's books, unless the employee specifically opts out. Employees also contribute 1% to an occupational pension scheme, which is matched by a 1% employer contribution.

82. OECD Pension Statistics

Evidence of Italian DC schemes capturing the benefits of scale is limited

Italian DC funds are generally more expensive than their UK counterparts, but there is a correlation between increased scale and lower charges. While the overall trend in UK and across Europe is one of reducing fund charges, Italian funds have on average seen their expenses ratios grow over the last 4 years. In 2017, the average Italian fund charge is 1.42% per year, almost 1% higher than the UK average.[83] However, the charges in larger funds are lower on average than charges in smaller funds.

In 2013, funds with less than 10 members had administration charges that were on average 0.16% higher than those of funds with more than 50 members. Schemes with more than €450 million AUM had charges nearly 0.2% lower than funds with less than €150 million AUM. However, investment charges appeared to have little correlation with fund size, although in some cases the investment charges of larger funds were more expensive. This could be because larger funds have access to a wider range of asset classes than smaller funds, some of which have the potential to be more effective but are also more costly to invest in.[84] Given that overall AUM in Italy's private sector pension system are relatively low compared to other countries, it is possible that even the largest funds have not yet achieved sufficient scale to fully access the benefits.

Italian pension funds' strategic allocations to alternatives are growing in number and scale

Italian DC funds generally allocate heavily to domestic assets, on average just under 60% compared to a UK average of around 30%.[85] Allocation to alternatives among Italian DC funds is small but growing, as funds increasingly acknowledge benefits that could be gained in terms of lower levels of risk and better meeting the long-term investment horizons of pension investors. However, it has also been encouraged by changes in the regulatory framework allowing for more flexibility in terms of allocation. There has also been pressure from the Italian Government for institutional investors to invest more in the domestic economy and local infrastructure projects, however this does not appear to have altered pension funds' investment behaviour as much as their search for better yields and reduced volatility. Whether this increased allocation to alternatives will result in more positive member outcomes remains to be seen.

An example of an Italian DC scheme increasing allocation to alternatives is the regional pension scheme for employees in the Trentino-Alto Adige region, the Laborfonds. The scheme has around €2.5 billion AUM, and its largest fund in terms of both members and AUM, the linea bilanciata fund has recently implemented a strategic asset allocation of 10% to alternatives. This allocation includes: €25 million in global private equity; €25 million in European infrastructure; €20 million in Italian renewable energy; and €5 million in local social housing. The fund will follow this with a further €25 million investment in European infrastructure in the next year.

The Italian pensions regulator has encouraged further consolidation

Although it has not mandated that smaller schemes should consolidate, the Italian pensions regulator, COVIP, has been encouraging scheme mergers for a number of years, particularly for older closed pension schemes. In regards to the potential benefits of pooling, the regulator has identified:

- Scale;
- Reduced costs; and
- The capacity of larger schemes to insource competencies with internal experts, of which the regulator considers there to be a shortage.[86]

83. Deloitte (2017)
84. Di Gialleonardo & Mare (2016)
85. PWC (2016)
86. IPE (2009)

Chapter three: implementing asset pooling in the UK Defined Contribution market

This chapter explores the potential areas of impact if asset pooling were to increase in the UK Defined Contribution (DC) market, as well as the potential barriers to further consolidation.

There may be a correlation between a less fragmented pension system and higher rates of return

Countries with fewer pension funds (between 30 and 149) are more likely to experience higher real net rates of return than those with more than 150 pension funds, after adjusting for the real growth rate of GDP, the size of the pension market, the asset allocation of pension funds and the developments in stock markets.[87]

The UK DC market may be able to function more effectively with fewer schemes, but progress towards greater consolidation has been slow

With 35,000 DC schemes overall, and around 3,000 schemes with more than 12 members, the fragmentation of the UK market far exceeds that of Australia, which has just under 250 schemes with more than 5 members. This means there may be scope for consolidation in the UK in the future. Progression towards a smaller number of larger pools of pension assets may improve member outcomes by reducing charges and enabling improvement of scheme governance functions.

Larger schemes may be able to achieve higher standards of governance, resulting in more sophisticated investment strategies, and as a result better returns and/or lower levels of volatility, and better value for money

In 2005, the PLSA (then the NAPF) stated that '*Larger schemes can achieve higher standards of control framework, procedures, secretariat advice, administration, accounts, reporting, probity and governance. They have more investment flexibility and they can achieve economies of scale in investment and other fees, custody, secretariat, advice, administration and accounting. These benefits are simply not available to small schemes.*'[88] This view has been echoed throughout the pensions industry in the years since then, however consolidation has been slow and many small schemes remain.

87. OECD (2016); This evidence comes from a relatively small sample of 20 countries and the study controls for a number of variables, so the conclusions that can be drawn from it are somewhat restricted.

88. NAPF (2005)

In practice, good governance can be the lynchpin for driving better value for money and, where it is absent, this could lead to significantly poorer outcomes for members

Good governance can:

- Set the right investment strategy for membership (considering for example, appropriate levels of risk, return and volatility), monitor it, and then take timely and appropriate action to change it if necessary;
- Ensure transparency around areas such as charges;
- Ensure effective administration;
- Ensure member communications are set at the right level of understanding, frequency and form, and that they increase member engagement, and drive good member decisions;
- Challenge, negotiate and possibly lower charges.

Where the absence of effective governance leads to the mismanagement of investments or the absence of internal controls, this can lead to significantly lower value of pension assets and less positive outcomes for members.

The extent of activity related to governance activity will depend on the size and complexity of the pension scheme. There is guidance from The Pensions Regulator (TPR) around the areas that governance should assess; these include:

- Appropriate contribution decisions;
- Appropriate investment decisions;
- Effective and efficient administration;
- Protection of assets;
- Value for money;
- Appropriate decumulation decisions.

Although contract-based schemes are regulated by the Financial Conduct Authority (FCA) rather than TPR, a similar set of principles apply.

Asset pooling has the potential to improve governance, which can lead to improved outcomes

Fund governance is particularly important for long-term investors such as pension schemes, as there is a positive correlation between the quality of governance and the quality of long-horizon investment.[89] However, it is difficult to identify or substantiate a governance premium because there is no single definition of good governance and as a result it is difficult to measure.

Small DC schemes in the UK have been found to underperform larger schemes in terms of governance and operational standards

Among trust-based schemes, all master trusts and large schemes are aware of the Pension Regulator's DC principles, with awareness falling to 96% among micro schemes. However, only 63% of medium schemes, 25% of small schemes and 21% of micro schemes identify as knowing 'a lot/quite a lot' about governance standards, compared to 88% and 100% for large schemes and master trusts respectively. Compliance with governance standards is also correlated with scheme size. Master trusts and large schemes are either 'very confident' or 'fairly confident' that they are able to meet the standards laid out in the code, compared with 60% of small and micro schemes.[90]

Good governance can be the lynchpin for driving better value for money and, where it is absent, this could lead to significantly poorer outcomes for members

89. Ambachtsheer & McLaughlin (2015)
90. TPR (2017b)

The composition and appointment of a scheme's trustee board, as well as the processes implemented by the board are a fundamental part of good governance. However, only 32% of micro schemes have a documented policy in place to assess the appropriateness of new trustees, compared to 91% of master trusts and 69% of large schemes with more than 1000 members. The trustee boards of smaller schemes are also likely to meet less frequently than those of larger schemes. Just 16% of trustee boards of micro schemes and 17% of small schemes meet at least quarterly, compared to 91% of large schemes and 65% of master trusts. Among trustee boards of micro and small schemes, 15% and 14% respectively have never had a trustee meeting, whereas boards of large schemes and master trusts generally meeting at least once every six months. Overall, micro and small schemes are less likely to feel that the trustee board has sufficient time and resources to properly run the scheme (85% and 86% respectively) than large schemes (99%) and master trusts (100%).[91]

Scale is not the only factor that determines governance quality. There are examples of small schemes with good governance and large schemes with poor governance. However, the benefits of scale may mean that larger schemes are able to achieve better results through quality governance.

Good investment governance requires schemes to balance returns, charges and volatility/risk appropriately

In order to implement good investment governance, schemes need to assess the objectives and characteristics of their membership. For larger schemes, performing an analysis of the profile of their members is common practice, with 93% of large schemes and 71% of master trusts doing so. Among smaller schemes this is less common; just 58% of small schemes and 49% of micro schemes have done so. Larger schemes are also more likely to conduct other forms of research to discover member preferences in relation to investment, including risk appetite, although even among larger schemes 60% have not.[92]

Documented objectives and performance targets for default funds are more prevalent in larger schemes; 100% of master trusts and 87% of large schemes carry out this process, with 90% of master trusts and 74% of large schemes which have done so reviewing objectives at least annually. 54% of micro schemes and 45% of small schemes document these objectives, with micro schemes (88%) more likely to review them at least annually than small schemes (77%). All master trusts and 73% of large schemes review the performance of their default fund in relation to the relevant targets and objectives at least quarterly, compared to 12% of micro schemes and 6% of small schemes. This number increases to 93% of large schemes, 20% of micro schemes and 14% of small schemes when considering schemes that review at least six monthly.[93]

Increased scale could allow for greater asset diversification and, as a result, the potential for lower levels of volatility without necessarily forgoing higher returns

Larger funds may be able to achieve improved returns by implementing a more sophisticated investment strategy and diversifying their portfolio in order to access alternative assets that are not highly correlated with the index and so offer characteristics that cannot be found in traditional assets such as equities and bonds.

While a bond/equity split will in theory deliver growth with a secure base over time, this type of investment is vulnerable to "shocks" such as market downturns. Bonds and equities are also being seen as less secure than they used to be because recent economic and political changes (such as the recession and "quantitative easing") have affected the return from these assets.[94]

There may be a correlation between a less fragmented pension system and higher rates of return

91. TPR (2017b)
92. TPR (2017b)
93. TPR (2017b)
94. UBS (2016)

Increased scale gives larger schemes greater capacity to invest in alternative asset classes, including capital-intensive assets such as infrastructure, which can provide greater diversification opportunities. Although investment in alternatives may not offer returns as high as those achieved by investing in equities, these structured and less economically sensitive asset classes, such as infrastructure and commodities, can achieve a more consistent cash-flow through lower levels of volatility, while providing higher returns than bonds.[95] Funds may also choose to invest in alternative asset classes because of the diversification opportunities provided by exposure to specific underlying return factors which are not necessarily available in liquid markets.[96]

Investment in alternatives, however, can lead to an increase in investment charges because for some alternative asset classes, transaction costs can be high in comparison to transaction costs for bonds and equities. The illiquidity of some alternative investments is one reason for these higher transaction costs, but there is a perception that this will be rewarded by higher returns, known as the illiquidity premium.[97]

Although smaller schemes can access these types of investments through investment in pooled vehicles, larger schemes are more able to manage their investments internally which can enable them to invest in alternatives at a lower cost. Some larger schemes may still choose to invest in these alternative asset classes through external vehicles, but they could still achieve cost savings as a result of scale because they have a stronger negotiating position when setting external investment management fees. Larger schemes may also be able to achieve more positive outcomes through investment in alternative asset classes if they develop greater internal expertise and so may be better able to identify which particular alternative assets have characteristics that will best help them meet their long-term investment objectives.[98]

A case study: the Local Government Pension Scheme

The Local Government Pension Scheme (LGPS)[99] is one of the largest public sector pension schemes in the UK with over 5 million members, including employees of local authorities and public service organisations. In 2015, the Government announced that the 89 existing LGPS funds would be required to consolidate their assets into six pools of at least £25 billion. This resulted from a number of consultations considering structural reform for the LGPS, with focus primarily on sustainability and cost efficiency, while improving investment returns. The potential for greater investment in infrastructure provided by greater scale was also a key argument given in favour of pooling LGPS assets. There are now eight LGPS asset pools, six of which meet the required scale criteria of assets worth £25 billion.

The argument put forward in favour of consolidation was that it could:

- Drive greater efficiencies in both administration and investment expenses;
- Enable greater investment innovation; and
- Drive better and more consistent governance of the funds.[100]

Although the LGPS is a Defined Benefit (DB) scheme, as it continues down the path of consolidation, it may offer lessons that are transferable to the DC market.

95. PWC (2016)
96. Markwat & Molenaar (2015)
97. Markwat & Molenaar (2015)
98. EDHECinfra (2017)
99. For more information see PPI Briefing Note 79 *Recent developments in the Local Government Pension Scheme*
100. NAPF (2013)

Volatility describes the range of gains and losses that a particular fund is likely to experience. A fund which has potential to experience high losses and gains has a high volatility and a fund with potential for low losses and gains has low volatility. In many cases volatility and returns are viewed as a trade-off, with funds incorporating higher levels of volatility in order to achieve higher returns. However, a high level of volatility exposes funds to the risk of high losses.

Effective management of volatility and risk can reduce the chances of having negative outcomes and limit downside risk

Volatility management allows greater certainty of outcomes. A reduction in volatility will result in the range of possible retirement outcomes diverging upon the mean, in effect reducing the size of pension pot that will be achieved in the top 10% of cases, but, more importantly, increasing the size of pension pot that will be achieved in the bottom 10% of cases, thus providing protection for the individuals who are most at risk of failing to secure an adequacy in retirement. Reductions in volatility may contribute to the outcomes of pension pot security and trust in the pension scheme provided that it operates in a transparent way.

Smaller schemes are less likely to monitor and manage risk levels effectively than large schemes and master trusts

While all master trusts and large schemes have a risk register, the number shrinks to 84% among medium schemes, 39% of small schemes, and just 24% of micro schemes. Trustee boards of large schemes and master trusts formally review the scheme's risk exposure at least annually, with 51% of large schemes and 74% of master trusts doing so at least quarterly. Among micro schemes, only 10% formally review risk exposure at least quarterly, while 27% do so less frequently than once a year and 20% never doing so.[101]

Much of the discussion surrounding the benefits of consolidation has focused on charges, rather than investment returns, risk and volatility

While charges impact upon member outcomes, investment returns and levels of risk and volatility affecting these returns also have an, arguably more significant, impact. An increased focus on charges may occur for a number of reasons:

- Charges are easy to identify and compare, whereas it may be more difficult to calculate reliable measures of risk and accurately collate this with the way that it interacts with rates of investment return.
- There may be a perception that funds have a greater ability to influence charges than investment returns which are influenced by a range of external factors.
- Scrutiny of costs may increase when funds' investment returns are comparatively poor.[102]

Average annual management charge (AMC) among UK DC schemes is relatively low compared to international DC funds. This is discussed in chapter one. However, there may be scope for reductions in charges through increased scale, particularly for schemes that levy charges above the average.

In initial questions posed by the Department for Work and Pensions (DWP) in the ongoing Automatic Enrolment Review, there was discussion of the impact of the charge cap. In its response to the review, the Investment Association suggested that as well as reducing charges, another consequence of the cap is a change in the conversations that occur between schemes and providers from 'what is optimal for the member to what can be achieved within the cost constraint imposed by the cap'.[103] Prior to the implementation of the charge cap, similar objections were made within the industry that value for money did not necessarily mean the lowest price. 'Low charges have obvious surface appeal but they can also produce adverse consequences for customers – poorer quality of services, less choice and loss of investment in innovation and development'.[104]

101. TPR (2017b)
102. Coleman, Esho & Wong (2003)
103. The Investment Association (2017)
104. IFAonline (2013)

Charge levels alone cannot be taken as an indicator of outcomes, and should be considered together with levels of return to provide an insight into value for money

Higher charges can be justified by higher returns, resulting in better outcomes for members. However, levels of return cannot be accurately predicted in advance and in practice neither higher nor lower charges are directly correlated with higher returns. Studies suggest that although some funds with active asset allocations perform better than passive funds, as a sector overall, higher charges are not a predictor of higher performance.[105] At the same time, passive funds with lower charges will never outperform the market's benchmark returns (returns before charges are taken into account) whereas some funds with active asset allocations will.

The average AMC for DC schemes in the UK is 0.46%, although some scheme charges fall much closer to the cap.[106] In fact, some older schemes exceed the charge cap considerably. Legacy schemes established prior to 2001 and not used for automatic enrolment are not subject to the 0.75% charge cap that applies to qualifying DC schemes.[107]

Schemes established prior to the introduction of stakeholder pensions are generally more expensive than the average and may have the most scope to improve member outcomes through asset pooling

There remain concerns around older schemes, with schemes set up before 2001 having an average annual charge which is 26% (or 0.16 percentage points) higher on average than those set up on or after 2001.[108] In 2015, just 26% of members of non-qualifying contract-based schemes paid charges within the 0.75% cap, and one in ten faced charges higher than 1%.[109]

It is important that charges are considered holistically alongside the level and quality of service provided in terms of value for money. While there is no single definition around value for money in pensions, most definitions agree that the scope of this should not be restricted to charges but should also include more qualitative elements, such as communication with members, and governance. However, based on the findings of its 2017 asset management market study, the FCA has stated that there is no clear relationship between charges and the gross performance of funds.[110]

In some cases, observed reductions in charges result primarily from a shift from active to passive investment management

A shift to passive management strategies will reduce costs compared to active management. Although some funds with active asset allocations perform better than passive funds, as a sector overall, higher charges are not a predictor of higher performance. Passive funds with lower charges will never outperform the market's benchmark returns (returns before charges are taken into account) whereas some funds with active asset allocations will. At the same time, however, passive funds will never underperform the benchmark.

The FCA has stated that 'rather than focusing on one strategy over another, it is important that investors understand both the total cost of investing and the objectives of the fund or mandate they are investing in, so that they can best meet their needs.'[111]

105. FCA (2017)
106. PLSA
107. See chapter one for more details
108. Independent Project Board (2014)
109. Thurley (2016)
110. FCA (2017)
111. FCA (2017)

Regulatory requirements may act as a barrier to further consolidation

The Pensions Regulator (TPR) has acknowledged that the shift towards consolidation in the DC market that has occurred so far has now slowed, and it may be that there are some regulatory barriers to further consolidation.

Regulatory barriers include:

- The scheme must obtain consent from individual members in order to consolidate; Or
- The requirement of an actuarial certificate; and
- Conditions that must be met in the consolidating schemes' relationship to one another; for example, that the transferring scheme and the receiving scheme relate to individuals who are or have been employed by the same employer, or where this is not the case that the transfer is a consequence of financial transaction or partnership between the two employers.

The 'relationship condition' may be particularly problematic for legacy schemes because in some cases the employer who established the scheme may no longer exist.

These regulations were originally designed to protect members of Defined Benefit (DB) schemes and may not be fit for purpose in a now predominantly DC pensions landscape.

Following on from the *Bulk transfers of defined contribution pensions without member consent*[112] review, in October 2017 DWP released a white paper (*The Occupational Pension Schemes (Preservation of Benefits, Charges and Governance) (Amendment) Regulations 2018*)[113] seeking views on draft regulations which would amend these barriers to consolidation. It proposes that:

- The need to obtain an actuarial certificate should be removed for 'pure' DC-DC transfers where there are no potentially valuable guarantees or options to be assessed; and
- The removal of the scheme relationship condition.

While the proposals would allow schemes to consolidate more easily, and as a result potentially deliver better outcomes for members, it is also important that the changes ensure that members remain adequately protected. As such, trustees would be expected to consider two aspects in particular:

- That the scheme is a well-run scheme, in which members' rights and benefits can reasonably be judged to be secure; and
- That the member outcomes will be of a similar or better standard than the ceding scheme.

The new process for bulk transfers without member consent would vary depending on the type of scheme to which members are being transferred.

If these proposals are realised, further guidance will be issued by DWP and TPR to assist trustees with this process.

Regulations are not the only potential barriers to DC schemes accessing the benefits of scale

The use of daily pricing in DC schemes may be discouraging increased allocation to more illiquid asset classes and is therefore a barrier to diversification. There is no regulatory requirement for schemes to use daily pricing, as opposed to a less frequent valuation method.

The Pensions Regulator on daily pricing:

Most members will not have a need for immediate liquidity of their investments, and it may not always be beneficial for dealing to be carried out daily. You should think about the level of liquidity that your members need, e.g. in relation to likely transfers from the fund, and in that context, consider the liquidity constraints on certain fund structures. You should seek to balance the liquidity of assets against the investment objectives. Holding too high a proportion of liquid assets may impact the level of investment return, and limit opportunity for diversifying your portfolio.[114]

112. www.gov.uk/government/consultations/bulk-transfers-of-defined-contribution-pensions-without-member-consent
113. www.gov.uk/government/consultations/bulk-transfers-of-defined-contribution-pensions-without-member-consent-draft-regulations
114. TPR (2016b)

Daily pricing is primarily used in order to allow members to view accurate and up to date information of their pension savings, as well as to allow members to transfer in and out of funds at any time. However, the benefits of diversification that schemes may be foregoing have the potential to affect member outcomes in a positive way. If the regulator wishes to encourage increased diversification among DC schemes, more may need to be done to precipitate a shift away from daily pricing to enable this.

Consolidation may not be the answer for all small pension schemes

While consolidation and the increased scale it brings have been linked to improvements in scheme management and member outcomes, size is not the only guiding factor when considering consolidation. Bigger does not necessarily mean better, as there are varying degrees of quality among schemes of all sizes. Assessment of governance standards and the extent to which the scheme is competitive in providing value for money and delivering positive outcomes for members is one of the most important considerations.

Mergers can be expensive to implement, as well as involving many complexities when it comes to merging not just assets of funds but also the cultures, strategic goals and governance structures of those funds.

Although smaller funds lack the capacity to unilaterally implement the same investment strategies as larger schemes, they may still be able to access the benefits of scale through outsourcing to pooled investment providers or through fiduciary management. Smaller funds may also have a greater capacity for tailoring strategies to individual members' needs and objectives. However, in some cases these benefits are now being somewhat eclipsed by larger schemes' capacity to deliver improved investment returns.

Chapter four: could asset pooling achieve improved outcomes for members of UK Defined Contribution schemes?

International examples of Defined Contribution (DC) asset pooling suggest that it could offer measurable benefits to member outcomes. The precise level of improvement that could be achieved through asset pooling is difficult to identify because the means through which these improvements might be achieved are complex and interact with one another in different ways.

Although the general direction of travel can be observed within international examples of pooling, the magnitude of its impact is more complicated to determine. In some cases large funds will capture one of the benefits of scale, such as a reduction in charges, without necessarily attaining other benefits of scale, such as achieving increased returns through diversification, despite having sufficient scale to do so, as may be evidenced from international examples. Some funds may already offer low-level charges, in which case increased scale is unlikely to have a great impact, but these funds may still be able to access other benefits of pooling by increasing diversification within their portfolio.

In order to illustrate the potential impact that asset pooling could have for fund members, this chapter identifies three individuals with varying characteristics and models the effects of different returns, volatility and charges on their pension pot size at retirement. The characteristics of these individuals represent different portions of the population.[115]

115. For more information on the PPI models used see Appendix.

Individual 1

Liam is a low earning male who works full-time from age 22 (in 2017) to State Pension age (SPa). During this time he is automatically enrolled and contributes with his employer, at 8% of band earnings. At age 35 he takes a 5 year break from paid employment due to disability, returning at age 40 and then works part-time to age 43, before returning to full-time work.

Individual 2

Niamh is a median earning female aged 30 in 2017. She works full-time from age 22 to State Pension age, during which time she is automatically enrolled into an occupational pension scheme to which she contributes, with her employer, 8% of her total earnings. She takes a 5 year break from paid work at age 50 to engage in family care, before returning to work full-time at age 55.

Individual 3

Priya is a high earning female aged 45 in 2017. She works full-time from age 22 to State Pension age, during which time she is automatically enrolled into an occupational pension scheme to which she contributes, with her employer, 10% of her total earnings. She takes a 5 year family care break from paid work at age 30, followed by 5 years of part-time work, before returning to work full-time at age 40.

The three individuals are assumed to accumulate pension wealth within a baseline scheme with annual charges of 0.46%, median investment returns of 6%, with a portfolio allocation of 60% to equities and 40% to bonds.[116] This is described as the 'baseline' throughout this chapter.

There may be a correlation between the size of a fund and lower fund charges, however there may be limited scope for UK DC schemes to achieve reduced charges through asset pooling because average UK charges are already relatively low

The average annual management charge (AMC) among UK DC schemes is 0.46%, compared to an Australian average of around 1% and an average of 1.09% among Mexico's Basic Siefore funds, although care must be taken when comparing charges of funds in different countries because they are not always directly equivalent or inclusive of the same components of cost.[117] With many UK DC charges already at a lower level than international funds, it would not be realistic to expect that asset pooling in the UK could generate the same magnitude of reduction in charges as has been observed internationally.

Larger funds in Australia with more than A$20 billion assets under management (AUM) can be as much as 40-50% cheaper for members than smaller funds with between A$5 and A$20 billion AUM.[118] Among Mexican funds, the range of charges is relatively narrow. The largest pension provider, Afore XXI Banorte, is also the provider offering the lowest fees, but, at 1%, they are not much lower than the average among other Mexican funds. In Australia, the range of charges levied by different funds is much greater. In 2017, the lowest charge offered by an Australian fund is 0.46%, the same level as the UK average charge and significantly lower than the Australian average.

Because average charges within UK DC schemes are already relatively low compared to those in the international examples discussed in chapter two, asset pooling would likely have a less pronounced impact on this aspect of schemes. Many UK schemes may struggle to achieve a similar level of reduction in charges as is observed in large schemes internationally, certainly without compromising the core functions and value for money offered by the scheme. However, if greater asset pooling were to achieve some reduction in charges, even on a smaller scale than is observed internationally, this could positively impact member outcomes (Table 3).

116. See the Appendix for more information on assumptions used.

117. For more information on the complexity of comparing charges internationally see page 14.

118. J.P. Morgan (2013)

Table 3: impact of AMC on individuals' pot size at retirement[119]

	0.75%	0.65%	0.55%	0.46%	0.45%	0.35%
Liam	£28,700	£29,400	£30,100	£30,700	£30,800	£31,500
Niamh	£88,100	£90,500	£92,900	£95,200	£94,500	£98,100
Priya	£201,900	£206,500	£211,300	£215,800	£216,300	£221,300

A 0.1% decrease in AMC could increase the size of individuals' pension pots at retirement by more than 2%

Accumulating in the baseline scheme:

- **Liam** could expect a pension pot of around **£30,700** from his occupational pension at retirement.
- **Niamh** could expect a pension pot of **£95,200**.
- **Priya** could expect a pension pot of **£215,800**.

If the economies of scale achieved by consolidation could lower AMC by 0.1%, members could see their pension pots increase by around 2.5%:

- **Liam's** pension pot could increase to **£31,400** (**2.4%** increase).
- **Niamh's** pot could increase to **£97,800** (**2.7%** increase).
- **Priya's** pot could increase to **£220,800** (**2.4%** increase).

Niamh's pot increases slightly more, proportionately, than either **Liam** or **Priya's** because she takes her break from paid employment later in life. **Niamh** contributes to her pension consistently until age 50.[120]

While there may be limited scope to reduce charges within schemes that are already offering low charges, members within certain types of scheme that generally have higher charges could benefit considerably from consolidation

The range of charges levied should also be considered, as UK schemes with the highest charges may offer opportunity for asset pooling to have the greatest impact. Charges within legacy schemes and other older schemes that are not used for automatic enrolment are considerably higher than the average within the UK DC market as a whole.

Pension pots of members within legacy schemes are particularly at risk of erosion as a result of charges, primarily because these schemes are more likely than newer schemes to have higher charges, but also because they are closed to new contributions, meaning that pension pots are frontloaded. This means that investment returns are the sole source of cash inflow and as a result pot sizes increase more slowly, with high charges eating into the achieved returns.

A significant proportion of these schemes have worked to reduce charges in recent years, either to below 1% or in some cases to 0.75% in order to comply with the charge cap. However, high charges persist in many cases, with 16% of AUM in contract-based DC schemes and 15% in trust-based DC schemes still at risk of charges higher than 1%.

119. In baseline scheme.

120. This means that by the time she takes her break from paid employment, she has already accumulated a pension pot of a significant size, meaning that it is more sensitive to changes in charges and investment returns than if she had taken her break earlier. Differences in charges and investment returns will have a greater impact on individuals who have frontloaded their pension pot by contributing consistently during earlier stages of their working life.

The impact of charges on the size of members' pension pots within legacy schemes could be substantial. A pension pot of £100,000 invested in a legacy scheme levying charges of 2% could be eroded by around 17% compared to a pot of the same size invested in a closed legacy scheme with 1% charges. When invested in a scheme with 2% charges, because there are no further contributions being made to the pot, it may result in the pension pot at retirement being eroded below £100,000 (in current earnings terms) (Chart 3).

The size of pension pot that the individuals' can hope to achieve by retirement is also affected by the level of volatility within their fund's investment strategy (Charts 4 to 9)

Fund volatility describes the breadth of the potential investment performances of a fund. The higher the volatility, the riskier the fund. Lowering volatility reduces the chances of more extreme outcomes, both reducing the probability of experiencing a loss as well as the probability of making higher gains.

Volatility is not a stand-alone variable within a fund's investment strategy. Attempts to manage or reduce volatility may involve trade-offs against other aspects of the investment process, particularly returns.

Finding an appropriate balance between equities and bonds (traditionally the most prevalent asset classes within pension funds' portfolios) as well as diversification into other asset classes centres around these trade-offs. Equities and other riskier asset classes may offer higher investment returns but this tends to come with higher volatility, compared with less risky asset classes such as gilts which provide a more consistent, but lower, investment return.

Diversification into other asset classes to reduce risk may come at a cost to overall return, as well as potentially resulting in higher charges to manage a more complex portfolio. Therefore, all other things being equal, the median return would not be expected to be maintained as volatility is reduced.

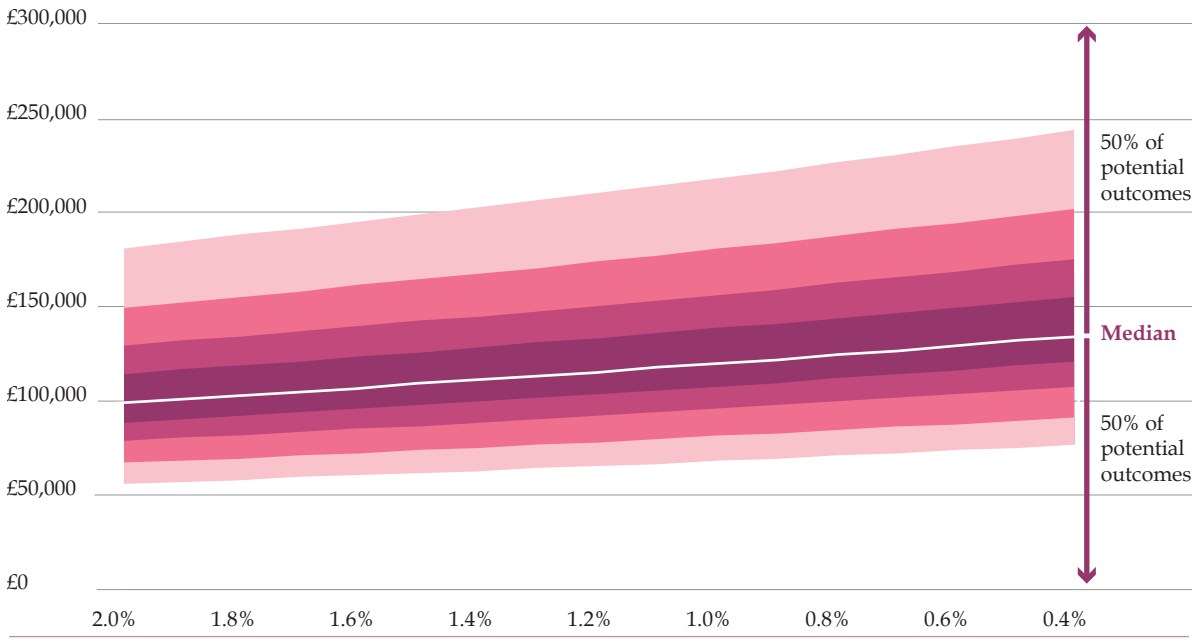
In the baseline fund, a 25% reduction in volatility could decrease uncertainty about pension outcomes by 10% to 30%. For example:

- If **Niamh** was a member of the baseline scheme, she has a 50% chance of accumulating a pension pot between **£77,100** and **£146,900**.
- In a fund that achieves a 25% reduction in volatility by implementing a different investment strategy, with the same level of charges and median returns, she has a 50% chance of accumulating between **£79,700** and **£138,000**.

Chart 3: impact of charges on the size of pension pots within legacy schemes[121]

Present value of £100,000 invested for 20 years under different charging scenarios

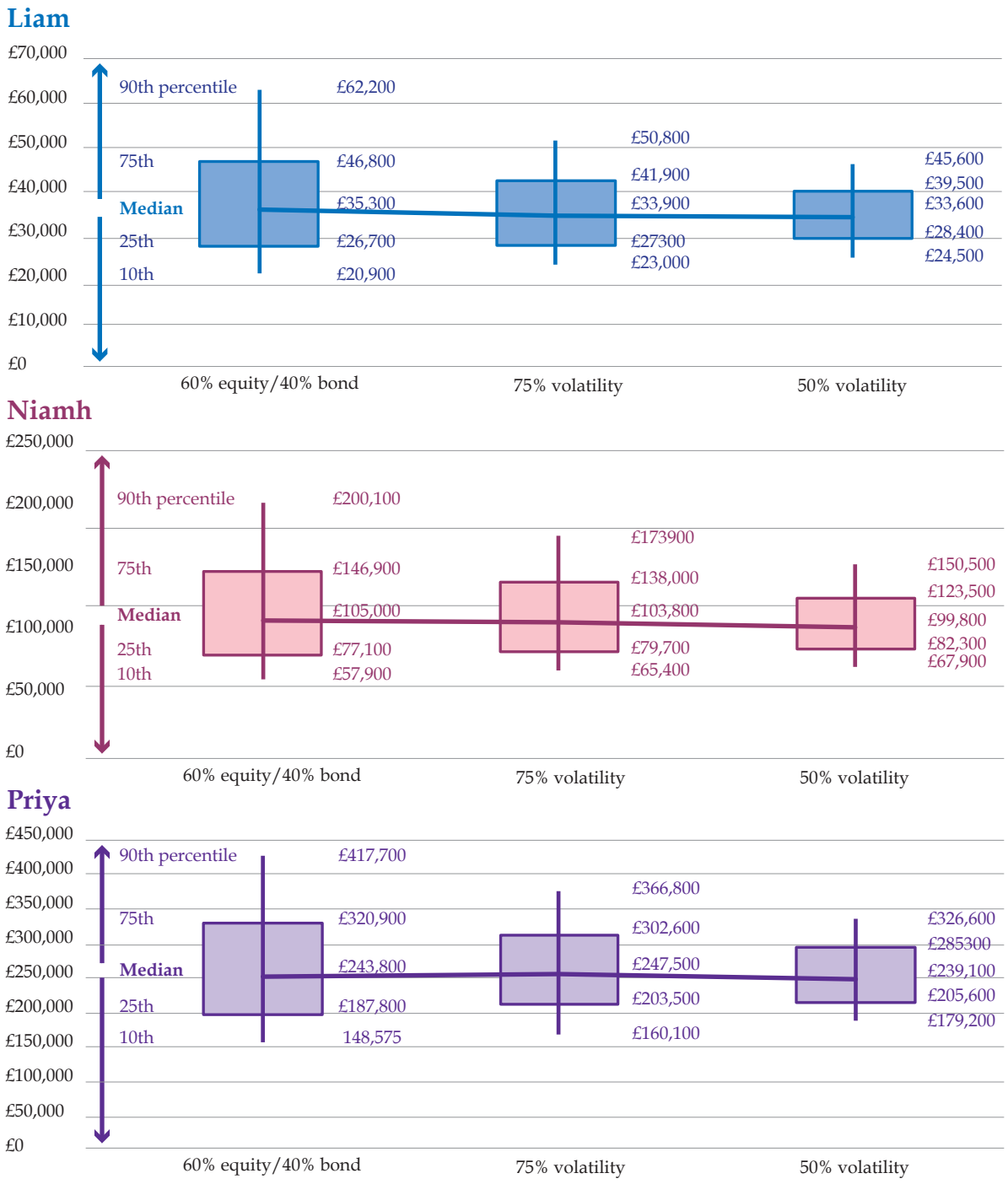
Each coloured band represents 10% of potential outcomes



121. In current earnings terms.

As this example illustrates, a reduction in volatility reduces the likelihood of higher than average outcomes as well as the risk of below average outcomes. Identifying an appropriate target volatility for a fund involves balancing the overarching goal of increased adequacy of retirement income with member risk appetites.

Charts 4, 5 and 6: impact of fund volatility on member outcomes



These charts are box plots. Box plots allow graphic representation of a distribution of outcomes. The rectangle represents the 25th to 75th percentiles of the distribution, while the ends of the vertical line represent the 10th and 90th percentiles. The horizontal line through the box shows the median.

The extent to which levels of volatility will impact the quality of member outcomes is also dependent on the individual member's pot size:

- If **Liam** was a member of the baseline scheme, his pension pot size at retirement has a 50% chance of falling between **£26,700** and **£46,800**.
- Had his contributions been invested in a scheme with 25% lower volatility than the baseline scheme, his accumulated pot size would vary much less, with a 50% chance of accumulating between **£27,300** and **£41,900**.
- Although nominally the level of upside and downside opportunity that Liam would forego by shifting to a lower volatility fund appears less than that which Niamh would forego, these changes could have a greater impact upon Liam's quality of life in retirement as he has a smaller pot and is therefore likely to be more sensitive to losses.
- For **Liam**, if his contributions are invested in the baseline scheme, he has a 25% chance of achieving a monthly income below **£110** from his private pension pot if he purchases an annuity.
- If his contributions are invested in a fund that achieves a 25% reduction in volatility, this increases to around **£120** per month. With a low income from his private pension, Liam will be heavily dependent on income from the State Pension.

As DC schemes increasingly allocate to alternative asset classes, there may be more scope for reducing fund volatility without compromising the level of investment returns.

Increased scale can also allow funds to diversify their portfolio across more asset managers, decreasing the impact on member outcomes if one manager underperforms.

If asset pooling can improve scheme governance, schemes may be able to achieve better returns and more positive outcomes for members

The increased returns that could be achieved through asset pooling are likely to have a greater impact on member outcomes than that of reduced charges. While a reduction in fund charges would increase the size of individual members' pension pots at retirement, as many savers are already charged at a relatively low level, the impact would be somewhat small for most outside of high charging legacy schemes. The potential for increased returns that may be accessed through increased scale and improved governance could have a much greater impact on the size of individual members' pension pots at retirement.

Increased scale can lead to improved governance at a scheme and fund level. Better governance leads to better outcomes. Research suggests that this 'governance premium' could be somewhere in the range of 0.35% to 1-2%, depending on the scheme's quality of governance prior to improvements and the strategies implemented to achieve improvements.[122] For example, a scheme that improves from 'moderate' to 'strong' governance would see less impact on outcomes than a scheme that improves from 'weak' to 'strong' governance. Similarly, the level of impact schemes are able to achieve through improved governance will be dependent on the strategies implemented.

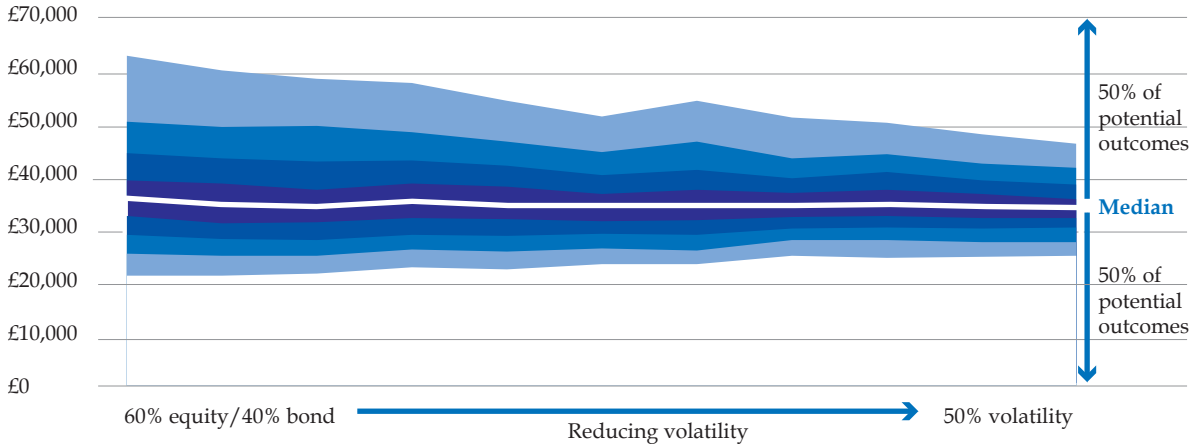
If the schemes to which the three individuals belong were able to achieve an increase in return rates, the individuals' pension pots would also increase. In order to achieve the same outcomes in retirement without achieving higher investment returns, individuals would have to increase their contributions to the fund. For illustrative purposes, both increased rates of return have been modelled for the three individuals.

122. Willis Towers Watson (2016); Ambachtsheer (2007); Clark & Urwin (2010);

Charts 7, 8 and 9: baseline scheme

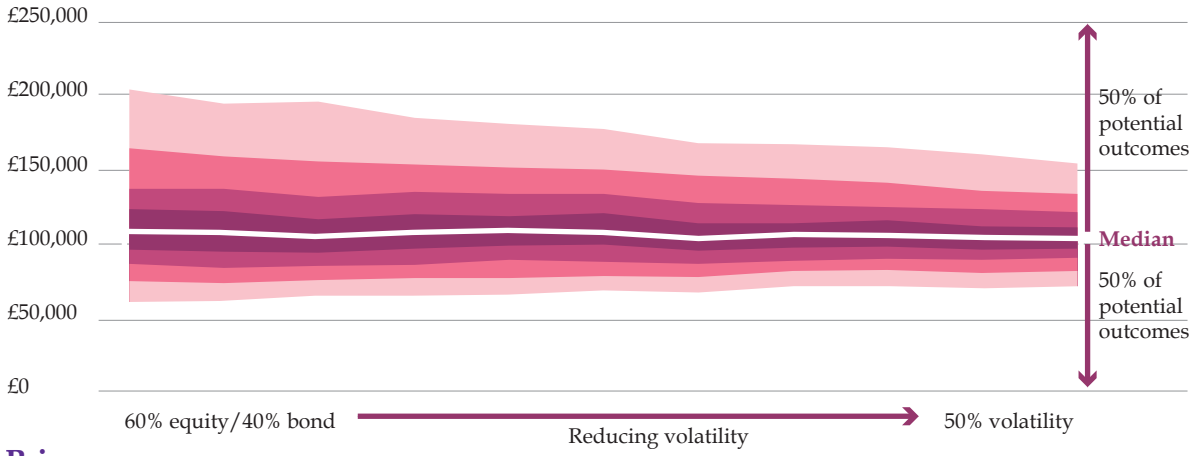
Liam

Each coloured band represents 10% of potential outcomes



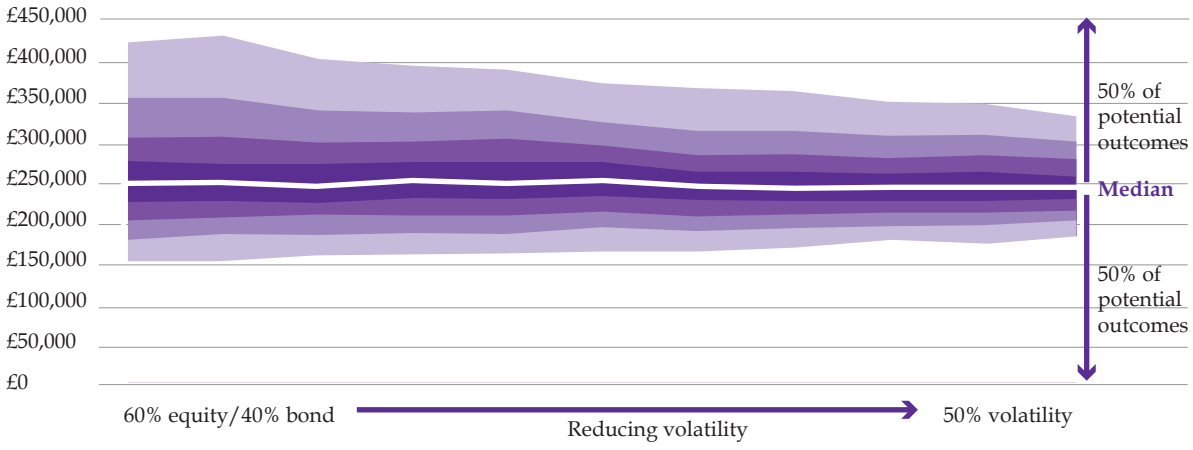
Niamh

Each coloured band represents 10% of potential outcomes



Priya

Each coloured band represents 10% of potential outcomes

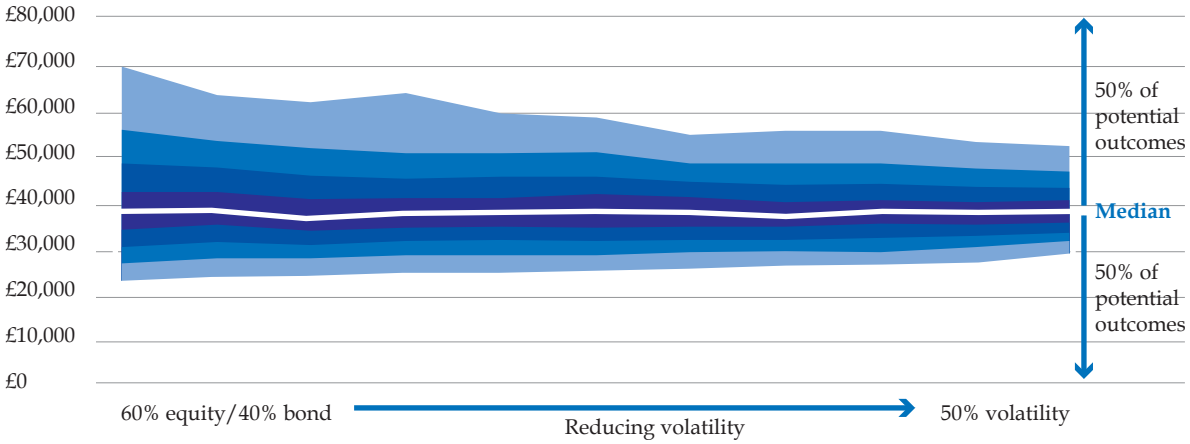


In the baseline scheme Liam has a 50% chance of accumulating a pension pot between £27,000 and £46,000. Niamh has a 50% chance of accumulating a pot between £77,400 and £144,500, and Priya has a 50% chance of accumulating between £187,800 and £320,900.

Charts 10, 11 and 12: baseline scheme with an additional 0.35% investment return

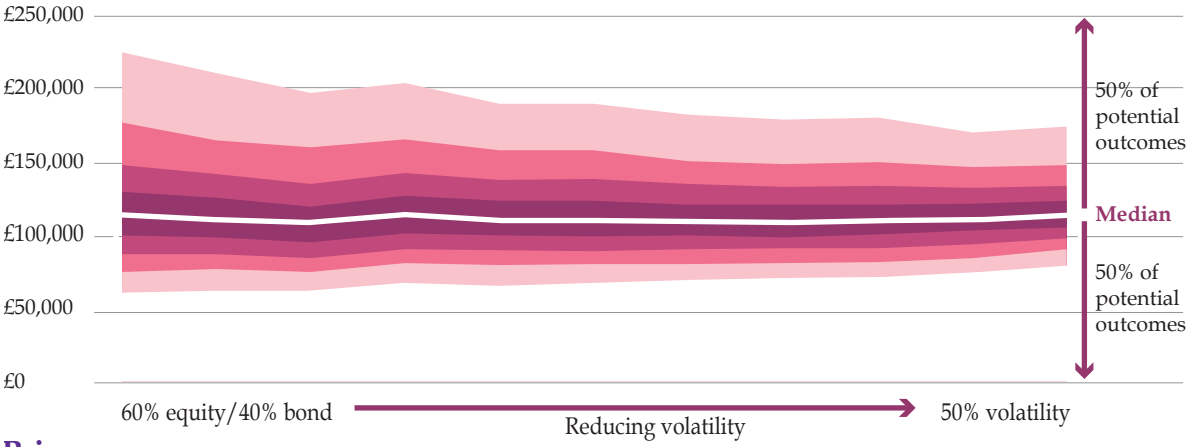
Liam

Each coloured band represents 10% of potential outcomes



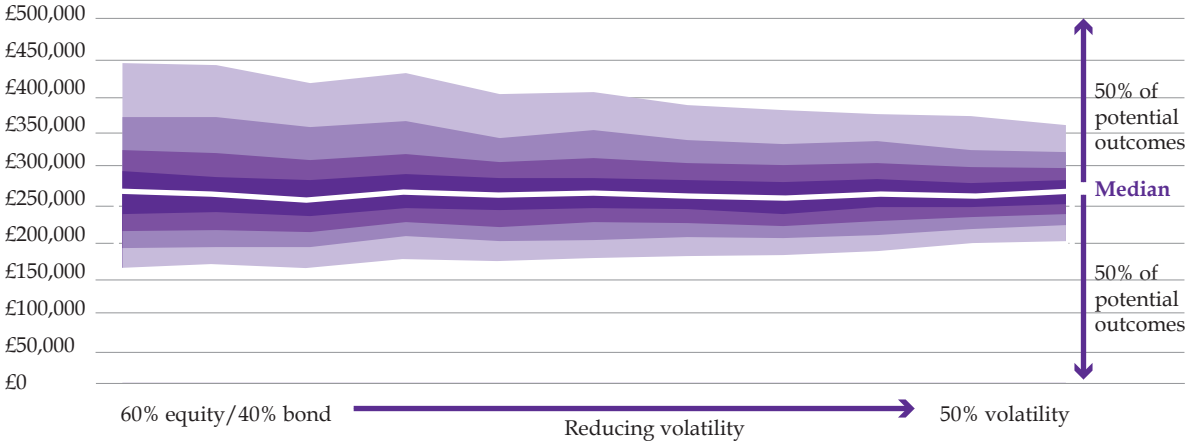
Niamh

Each coloured band represents 10% of potential outcomes



Priya

Each coloured band represents 10% of potential outcomes



These charts illustrate the impact of a 0.35% increase of the baseline scheme's median return on the size of individuals' pension pots at retirement. Each shaded area represents 10% of the distribution of outcomes.

If the fund were to achieve an increase of 0.35% on the median return:

- **Liam's** pot size could increase to **£37,100** (**18%** increase) (Chart 10/Table 4).
- **Niamh's** to **£113,600** (**16%** increase) (Chart 11/Table 4).
- **Priya's** to **£259,600** (**18%** increase) (Chart 12/Table 4).

In order to achieve similar outcomes while invested in the baseline fund, individuals' contribution rates would have to increase by between 0.3 and 0.7 percentage points.

- **Liam** would need to contribute at **8.4%** in the baseline fund in order to accumulate the same size pension pot as he would with 8% band-earnings contributions to a fund with median returns 0.35% higher.
- **Niamh's** contributions would have to increase to **8.7%** to achieve the same results.
- **Priya** would have to increase her contributions to **10.7%** in order to achieve the same pot size within the baseline fund as she would have with 10% contributions to a fund with 0.35% higher median returns.

Although these may appear to be relatively small contribution increases, they represent a considerable cost to the individuals over the course of their working lives.

If the fund was able to achieve the higher increase of 1.5% members' pension pots would increase further (Charts 13 to 15). However, this level of increase would require greater improvements in fund governance and investment strategy and so would be more difficult to achieve. Schemes would need to set clear objectives and strategies in order to achieve this magnitude of increase in returns which is unlikely to be achieved through scale alone.

Table 4: impact of returns on individuals' pot size at retirement[123]

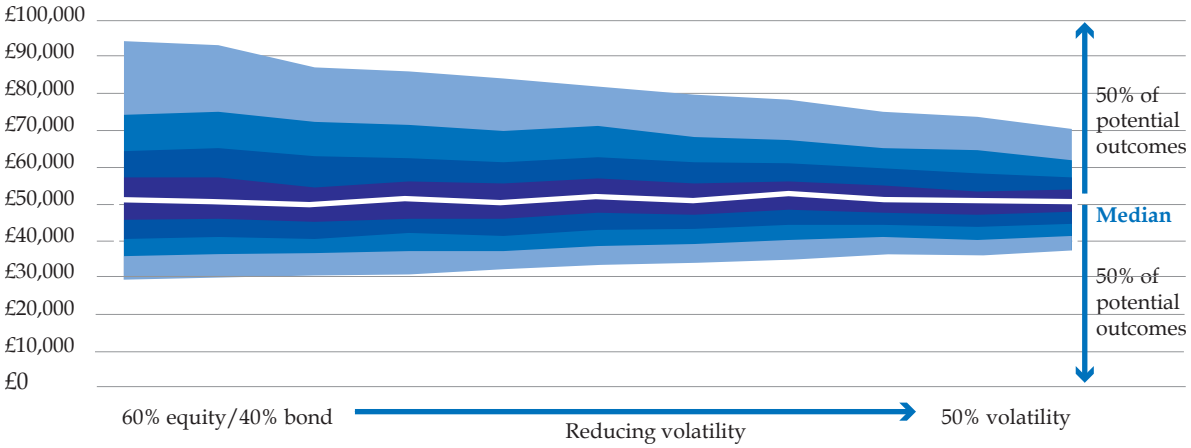
	Baseline	+ 0.35%	+ 1.5%
Liam	£31,400	£37,100	£49,700
Niamh	£97,800	£113,600	£158,400
Priya	£220,800	£259,600	£322,400

123. Assumes AMC of 0.36%

Charts 13, 14 and 15: baseline scheme with an additional 1.5% investment return

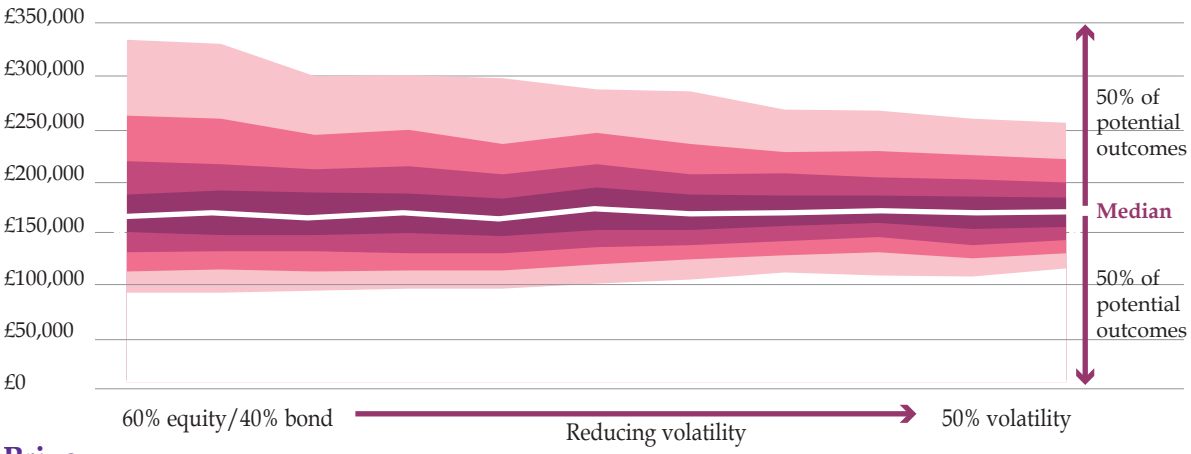
Liam

Each coloured band represents 10% of potential outcomes



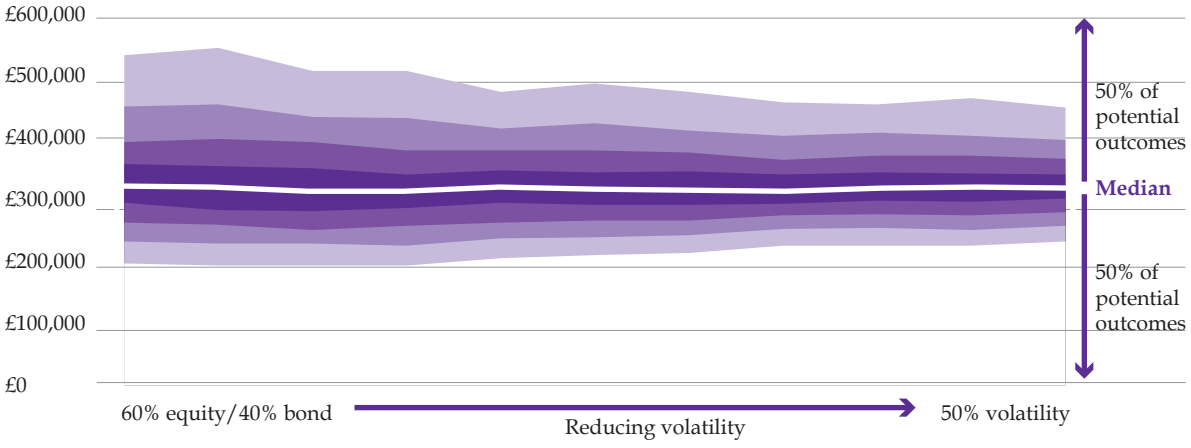
Niamh

Each coloured band represents 10% of potential outcomes



Priya

Each coloured band represents 10% of potential outcomes



These charts illustrate the impact of a 1.5% increase of the baseline scheme's median return on the size of individuals' pension pots at retirement. Each shaded area represents 10% of the distribution of outcomes.

With the larger pension pots that could be achieved through higher returns, the individuals' monthly income in retirement, if they chose to purchase an annuity, would also increase

With the introduction of Freedom and Choice in 2015, it is no longer required that individuals purchase an annuity with their DC pot upon reaching retirement. Individuals may now choose to access their pension savings via drawdown. However, consideration of the level of income the three individuals would be able to purchase through an annuity further illustrates what the impact of asset pooling could be for individual scheme members (table 5)

Liam's pension pot could grow to **£49,700**, an increase of **58%** compared to a pot accumulated in the baseline scheme. This increase would enable Liam to purchase an annuity that could provide him with an income of **£210** per month, compared to an income of **£150** under an annuity which he could have purchased had his pot been accumulated in the baseline scheme.

The monthly income provided by an annuity **Niamh** could purchase with her accumulated pot had it been invested in a fund with an additional 1.5% investment return would be considerably higher than her monthly income from a pot accumulated in the baseline scheme (**£660** compared to **£440**). In a fund with an additional 1.5% median return, **Niamh** could achieve a pension pot of **£158,400**, **62%** and **39%** more than she would have accumulated in the baseline scheme and +0.35% investment return scenario respectively.

Priya could accumulate **£322,400**, with which she could purchase an annuity that would provide her with a monthly income of **£1,370**, compared to a monthly income of **£1,040** if it had been accumulated in the baseline scheme. In a fund with an additional 1.5% investment return, her pension pot size increased by **46%**. Compared to the pot she would have accumulated in a fund with the additional 0.35% investment return, her pot increased by **24%**.

As a member of the baseline scheme, if the individuals chose to purchase an annuity at retirement, when combined with income from State Pension, **Liam** would be likely to achieve a replacement rate of **82%** to **83%**, although depending on the levels of volatility within the fund, his replacement rate could vary from **75%** to **97%**. For **Niamh** and **Priya**, their replacement rates would be lower because their earnings were higher than **Liam's** throughout working life and so are more difficult to replicate. In the baseline scheme, **Niamh** could achieve a replacement rate of **77%** to **78%** (varying from **64%** to **108%** depending on fund volatility) and **Priya** could achieve a replacement of **54%** to **55%** (varying from **42%** to **79%**).

In a scheme with the same level of charges but an increase of 0.35% in investment returns, **Liam** could achieve a replacement ratio of around **89%**, **Niamh** a replacement of around **95%**, and **Priya** a replacement of around **65%**. All three individuals would see their income in retirement grow considerably if their contributions were invested in a fund with higher returns, but **Niamh's** would increase by the greatest margin as her 'frontloaded' pension pot is more sensitive to increases in investment returns during her break from paid employment, which she takes later in her working life than **Liam** and **Priya**.

In order to achieve similar outcomes in the baseline scheme, the three individuals would have to increase their contributions further, to around **11.3%** for **Liam**, **12.1%** for **Niamh**, and **13.3%** for **Priya**, an increase of between 30% and 50% which would significantly impact their income throughout working life.

Table 5: impact of returns on individuals' pot size and monthly income (if an annuity is purchased)

	Baseline investment returns		Baseline + 0.35% investment returns		Baseline + 1.5% investment returns	
	Pot size	Monthly income	Pot size	Monthly income	Pot size	Monthly income
Liam	£31,400	£150	£37,100	£160	£49,700	£210
Niamh	£97,800	£440	£113,600	£480	£158,400	£660
Priya	£220,800	£1040	£259,600	£1100	£322,400	£1370

Appendix: PPI modelling

The modelling for this report considers the projection of an individual using the PPI's Suite of pension models, using a stochastic approach of economic assumptions. The economic scenarios are generated using the PPIs economic scenario generator. The models used are detailed below. Results are presented in 2017 earnings terms.

The pensions system

The pension system modelled is as currently legislated. The triple lock is assumed to be maintained. Individuals are assumed to be members of a Defined Contribution (DC) occupational pension scheme.

General assumptions

Investment returns are modelled stochastically with curves generated by the PPIs Economic Scenario Generator (ESG). 1,000 scenarios were produced providing values for equity returns, bond returns, cash returns, CPI and earnings increases each year for each scenario. Unless specified in the text the assumed median values for each of these values are listed below:

CPI: 2.0%

Earnings: 4.3%

Fund return: 6%

Fund volatility: equivalent to a portfolio mix of 60% equity, 40% bond

Other economic assumptions

Other economic assumptions are taken from the Office for Budget Responsibility's Economic and Fiscal Outlook (for short-term assumptions) and Fiscal Sustainability Report (for long-term assumptions).

Fund charges are assumed to be 0.5% for DC/master trust schemes set up for automatic enrolment.[124]

Long-term earnings growth is assumed to be 4.3%, and other economic assumptions are taken in line with Office of Budget Responsibility (OBR) assumptions,[125] derived from their 2017 Fiscal Sustainability Report. The earnings band for automatic enrolment contributions and minimum salary assumption are assumed to grow with average earnings.

124. Equivalent Annual Management Charge for multi-employer/Master trust schemes such as Legal and General's Worksave, NEST and The People's Pension.

125. OBR (2017)

The individuals modelled

The individuals modelled are designed to illustrate the typical impact that may be experienced by members of a DC pension scheme. Their key features are detailed in Table 10.

Liam

Liam is a low earning man who has been automatically enrolled into his employer's pension scheme. He is unable to work for a five year period due to disability.

Niamh

Niamh is a median earning woman who is a member of her employer's pension scheme. She takes a five year career break as an older worker to undertake caring commitments.

Priya

Priya is a high earning woman who is a member of her employer's more generous pension scheme. She takes a five year career break in her thirties to act as her family carer.

The Economic Scenario Generator

The PPI's Economic Scenario Generator (ESG) is used to produce randomly generated fuiture economic scenarios based upon historical returns and an assumption of the median long-term rates of return. It was developed by the financial mathematics department at King's College London. It is used to test how the distribution of outcomes is influenced by the uncertainty of future economic assumptions.

Key results

The model generates projected future inflation rates, and earnings growth

- Inflation rates
  - Future CPI increases and earnings inflation rates
- Investment returns
  - Returns are produced for the major asset classes of equity, cash and gilts

This produces nominal returns which can be combined to produce investment returns for a more complex portfolio.

Application of output

The output of the ESG is a number of economic scenarios which are employed by the PPI's other models to analyse the distribution of impacts on a stochastic economic basis.

Key data sources

The specification of the model is based upon historical information to determine a base volatility and future assumptions to determine a median future return:

- Historical returns: Historical yields and returns as well as inflation measures are used to determine the key attributes for the projected rates
- Future returns: Future returns are generally taken from the Office for Budget Responsibility (OBR) Economic and Fiscal Outlook (EFO) to ensure consistency with other assumptions used in the model for which the economic scenarios are being generated. Volatility can also be scaled against historical levels.

Table 10: Key characteristics of individuals

Characteristic	Liam	Niamh	Priya
Age in 2017	22	30	45
Earnings profile	10th percentile of age-specific male NAE	50th percentile of age-specific female NAE	90th percentile of age-specific female NAE
Career breaks	5 years from age 35 for disability	5 years from age 50 for caring	5 years from age 30 for family caring
Pension contributions (total of employer and employee)	8% of band earnings	8% of total earnings	10% of total earnings

Summary of modelling approach

The six identified risk factors modelled are:

G	Nominal GDP
P	CPI
W	Average weekly earnings
Y^l	Long-term yields
Y^s	Money market yields
S	Stock returns

Using these variables, a six dimensional process, x_t is defined.

$$x_t = \begin{bmatrix} \ln G_t - \ln G_{t-12} \\ \ln(P_t - \ln P_{t-12} + 0.02) \\ \ln W_t - \ln W_{t-12} \\ \ln\left(e^{Y_t^l} - 1\right) \\ \ln\left(e^{Y_t^s} - 1\right) \\ \ln S_t \end{bmatrix}$$

Where t denotes time in months.

The development of the vector x_t is modelled by the first order stochastic difference equation:

$$\Delta x_t = A x_{t-1} + a + \varepsilon_t$$

Where A is a 6 by 6 matrix, a is a six dimensional vector and ε_t are independent multivariate Gaussian random variables with zero mean. The matrix A and the covariance matrix of the ε_t were determined by calibrating against the historical data. The coefficients of a were then selected to match the long term economic assumptions.

It follows that the values of x_t will have a multivariate normal distribution. Simulated investment returns will, however, be non-Gaussian partly because of the nonlinear transformations above. Moreover, the yields are nonlinearly related to bond investments.

The first component and third components of x_t give the annual growth rates of GDP and wages, respectively. The fourth and fifth components are transformed yields. The transformation applied ensures that the yields are always positive in simulations. Similarly the second component gives a transformed growth rate of CPI. In this case, the transformation applied ensures that inflation never drops below -2% in the simulations. This figure was selected to be twice the maximum rate of deflation ever found in the historical data.

The Individual Model

The Individual Model is the PPI's tool for modelling illustrative individual's income during retirement. It can model income for different individuals under current policy, or look at how an individual's income would be affected by policy changes. This income includes benefits from the State Pension system and private pension arrangements, and can also include income from earnings and equity release. It is useful to see how changes in policy can affect individuals' incomes in the future.

This model can be used in conjunction with economic stochastic scenarios derived from the PPI's economic scenario generator to produce stochastic output.

Key results

The key output from the model is the built-up pension wealth and entitlement over the course of the individual's work history and the post-retirement income that results from this.

The post-retirement income is presented as projected cashflows from retirement over the future lifespan of the individual. These are annual cashflows which include the following key items:

- State Pension
  - Reflects entitlement and the projected benefit level of state pension components.
- Private pension
  - Derived from the decumulation of the pension pot, allowing for tax-free cash lump sum and the chosen decumulation style (e.g. annuity or drawdown).
- Other state benefits
  - Other benefits contributing to post-retirement income such as pension credit.
- Tax
  - Tax payable on the post-retirement income, to understand the net income available to the individual.

These cashflows are calculated as nominal amounts and restated in current earnings terms.

Outcomes are expressed in current earnings terms for two reasons; it improves the comprehension of the results and reduces the liability of either overly optimistic or cautious economic assumptions.

Application of output

The model is best used to compare outcomes between different individuals, policy options, or other scenarios. The results are best used in conjunction with an appropriate counterfactual to illustrate the variables under test.

Key data sources

The specification of a model run is based upon three areas:

The individual

The individual to be modelled is specified based upon an earnings and career profile. Saving behaviour for private pension accumulation is considered, as well as the behaviour at retirement.

These are generally parameterised according to the project in question, designed to create vignettes to highlight representative individuals of the groups under investigation.

The policy options

The policy option maps the pension framework in which the individual exists. It can accommodate the current system and alternatives derived through parameterisation. This allows flexing of the current system to consider potential policy options to assess their impact upon individuals under investigation.

This area has the scope to consider the build-up of pensions in their framework such as the auto-enrolment regulations for private pensions and the qualification for entitlement to state benefits.

The framework in retirement allows for the tax treatment and decumulation options taken by the individual as well as other sources of state benefits which influence the post-retirement outcomes for individuals.

Economic assumptions and scenarios

The model is capable of running with either deterministic or stochastic economic assumptions.

The deterministic assumptions used are generally taken from the Office of Budget Responsibility (OBR) Economic and Fiscal Outlook (EFO) to ensure consistency.

They cover both historical data and future projected values. Alternatively the model can be used in conjunction with the PPI's Economic Scenario Generator (ESG) to produce a distribution of outputs based upon potential future economic conditions.

Summary of individual modelling approach

The model projects the pension features of the individual, both in accumulation (pre-retirement) and decumulation (post retirement) phases.

It projects the pre-retirement features of the individual through the accumulation of pension entitlement, both state benefits and occupational Defined Benefit schemes.

This is done through the modelling of the career history of the individual, deriving pension contributions and entitlement from the projected earnings profile.

The entitlement to and the level of state benefits are projected such that from retirement their contribution to the income of the individual can be calculated. Private pension income is modelled and assumes a decision about the behaviour of the individual at retirement. This allows for the chosen decumulation path of any accrued private pension wealth.

Limitations of analysis

Care should be taken when interpreting the modelling results used in this report. In particular, individuals are not considered to change their behaviour in response to investment performance. For example, if investments are performing poorly, an individual may choose to decrease their withdrawal rate and vice versa.

Monte Carlo simulation can be a powerful tool when trying to gain an understanding of the distribution of possible future outcomes. However, in common with other projection techniques, it is highly dependent on the assumptions made about the future. In this case, the choice of distribution and parameters of the underlying variables, the investment returns of equities, gilts and cash are important to the results.

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