PENSIONS POLICY INSTITUTE

# PPI

# The Future Book: unravelling workplace pensions

2017 Edition

The third annual report commissioned by

# The Future Book: unravelling workplace pensions

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# Foreword

The number of UK pension savers and employers going through automatic enrolment has increased markedly in recent years, reaching 8.3 million savers and close to 700,000 employers today, according to this year's ***The Future Book: unravelling workplace pensions***. 2018 marks a milestone in the auto-enrolment journey as joint contributions reach 5% in April, further increasing to 8% the following year.

The positive impact on people's savings levels is clear, but what could this mean for drop-out rates? Is 8% enough for people to achieve their desired standard of living in retirement and do they invest their savings in a way that maximises their chances to do so?

Commissioned by Columbia Threadneedle Investments, ***The Future Book*** aims to shine a light on these questions by providing extensive insight into the state of play of UK workplace pensions, the challenges faced by those saving for retirement and what the Defined Contribution (DC) pension landscape may look like in the future.

Now in its third year, the publication continues to show that DC pension savers and their employers are not contributing enough to DC pension pots. A median earner investing 8% of earnings from age 22 until State Pension age would only have a 50% chance of achieving a similar standard of life in retirement to that of their working lives. Today, the median DC pension pot size at State Pension age stands at £28,000.

It is also apparent that people are not investing their pension in a way that makes the most of their money or protects them adequately against market downturns - and they may not even realise this. The vast majority of savers invest their hard-earned savings in their pension scheme's default fund. At 99.7%, master trusts have the highest proportion of members to do so, followed by 94% for group personal pensions. In most cases, these default funds employ a lifestyle strategy, which in the first 20 years invests heavily in equities and later on adds bonds and cash to the asset mix.

In this year's edition, the PPI has undertaken unique research into how fund design affects savings outcomes for scheme members. It compared the different default investment strategies (low volatility, high risk, lifestyle and diversified growth funds) and assessed their likely financial outcomes. Importantly, these portfolios were tested for market shocks.

The results speak for themselves. For a median earner contributing 8% from age 22 until State Pension age, high risk funds deliver the highest median returns, resulting in a pension pot of around £102,000. However, as their name suggests, these funds are also the most likely to incur a loss within the first five years. And according to NEST, the UK's largest master trust, people with low

risk appetites and low incomes are more likely to be put off by losses incurred during the early stages of pension saving and opt out. Diversified Growth Funds, on the other hand, are the least likely to experience an initial loss during the early stages of accumulation, having a 6% chance of incurring a loss compared to high risk funds at 23.5%. They also deliver the next highest median returns at £88,000. Lifestyle funds - the default option for most pension savers - deliver median returns of around £84,000 at State Pension age but are the second most likely to make a loss within the early stages of pension saving.

What this means is that DC scheme members are not making the most of the money they invest. Auto-enrolled savers in particular, but not exclusively, tend to struggle making active investment decisions, ending up in their pension scheme's default fund which may not be fit-for-purpose. In addition, they could cease contributions as a result of potential losses incurred during the early stages of pension saving, compounding the nation's savings problem.

The urgency is real. People are becoming increasingly reliant on their DC pension pots for their retirement savings and assuming current trends in scheme allocation continue there could be around 14.2 million active members and £682 billion worth of assets in DC workplace pension schemes by 2035, according to ***The Future Book***.

We therefore believe that the pensions, asset management, public policy, regulatory and adviser communities need to come together to design and offer pension savers better and genuinely fit-for-purpose default DC investment options. These funds should have a deliverable inflation-plus, absolute return objective and protect against market downturns, by applying genuinely skilful, dynamic asset allocation and active fund management to a well-diversified asset mix. When allied to a competitive charging structure, such funds are hard to beat.

We hope that ***The Future Book*** continues to help in the endeavour to encourage better pension saving outcomes for millions of people in the UK.

Michelle Scrimgeour
CEO, EMEA at Columbia Threadneedle Investments

# Introduction

Demographic, policy and market changes mean that future retirees will live longer, receive State Pension later, be more likely to reach retirement with Defined Contribution (DC) savings (with no or low levels of Defined Benefit (DB) entitlement), and experience flexibility of access to DC savings. Greater numbers of DC savers, coupled with flexibility of access, increases the risk and complexity that people with pension savings face at and during retirement.

Given the potential risks involved for those retiring with DC savings, and the rapid expansion of the workplace DC market, it is important that a comprehensive compendium of DC statistics and data is available to allow observation of, and reaction to, developing trends.

The Pensions Policy Institute (PPI), commissioned by Columbia Threadneedle Investments, is publishing the third edition of its annual DC compendium, "***The Future Book***", setting out available data on the DC landscape alongside commentary, analysis and projections of future trends.

Chapter one briefly describes the state and private pension system in the UK and outlines the main landscape changes over the past few years, focussing mainly on those affecting DC pensions.

Chapter two makes use of available data and PPI analysis to paint an overall picture of the current state of play within the DC market, both on an individual and aggregate level.

Chapter three uses PPI modelling to explore how the DC landscape might evolve in the future both for individuals and on an aggregate level.

Chapter four considers which default fund investment strategies might be the most appropriate for people depending on their income and attitudinal characteristics.

Chapter five contains reflections on the policy themes highlighted by the report from leading thinkers and commentators in the pensions world.

# Chapter one: What is the "DC landscape"?

This chapter briefly describes the state and private pension system in the UK and outlines the main landscape changes over the past few years, focussing mainly on those affecting Defined Contribution (DC) pensions.

There are two main tiers to the state and private pension system (Box 1):

- A compulsory, redistributive state tier; and,
- A voluntary, private tier[1]

Box 1: the state and private pension system

| Feature | State tier | Private tier |
|---|---|---|
| Aim | The State Pension provides a basic level of income above the main income-related benefit for pensioners, Pension Credit with the effect of redistributing money from those better off to those less well-off. | Private pensions redistribute income across an individual's life course. |
| Contributions | Contributions are compulsory for all workers below State Pension age and are paid through National Insurance contributions. | Contributions are voluntary, though automatic enrolment requires eligible workers to pay minimum contributions while enrolled. Employers are required to pay pension contributions for employees who do not opt-out. |
| Structure | Pre April 2016, two tiers:<br>· Basic State Pension<br>· State Second Pension<br>Post April 2016, one tier:<br>· New State Pension | Private pensions vary in benefit structure:<br>· Defined Benefit schemes deliver a proportion of salary<br>· Defined Contribution pension pots depend on level of contributions, charges and investment returns |
| Provider | The State Pension is provided and administered by the Government. | Private pension schemes are either provided directly by employers or through third parties. Access to private pension schemes is generally through the employer, though individuals can join personal pension schemes. |

[1] For further detail regarding the UK pension system, see PPI's Pension Primer (2017)

There are benefits associated with saving in private pensions

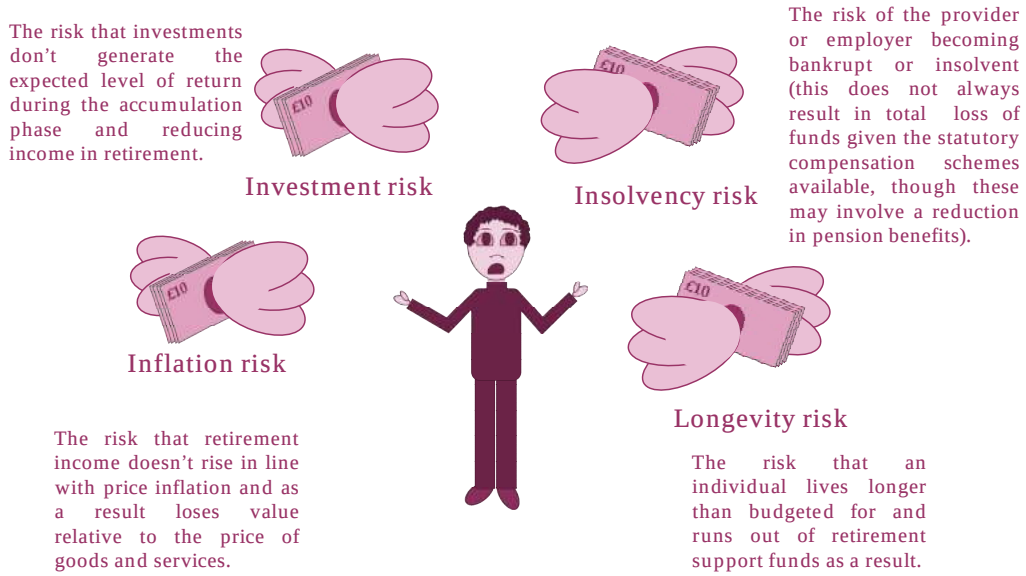
Private pension savings (along with other savings and assets) can be used to top up state pension income and increase people's standards of living in retirement. Private pensions provide benefits over other forms of saving:

- The long-term nature of pension saving allows for compound interest to accrue over time, which can substantially increase fund sizes.
- Eligible employees enrolled in workplace pensions receive employer contributions.
- Pension contributions and investment returns are given tax relief (subject to certain limits).

## There are risks associated with saving in and accessing private pensions

The main pension risk is not saving enough to achieve an adequate standard of living in retirement.[2] Other significant risks are:

Figure 1




There are other risks associated with saving in and accessing private pensions including (but not limited to):

- Making sub-optimal decisions about how to access retirement savings,
- Excessive product charges,
- Poor retirement income product rates, and
- The risk of needs in retirement changing unexpectedly, for example, as a result of developing health and social care needs.[3]

[2] PPI (2013)

[3] Blake, Harrison (2014); PPI (2012b)

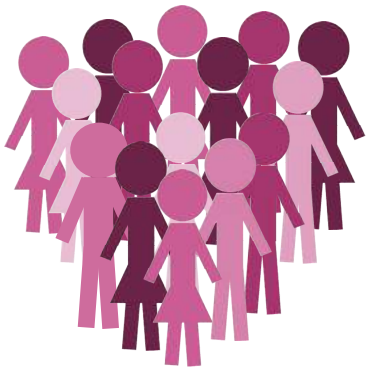
Scheme type has implications for the balance of risk:
Figure 2


| Defined Contribution schemes: The scheme member bears the investment, inflation and longevity risk. The member does not bear much insolvency risk. | Hybrid, risk-sharing schemes: Risk is shared between the employer and employee or between employees. Members bear the insolvency risk. | Defined Benefit schemes: The employer bears the investment, inflation and longevity risks. The member bears the insolvency risk, though there are mitigations. |
|---|---|---|

The pensions landscape has changed over the last few decades as a result of demographic, market, policy and regulatory shifts (Box 2-5).

Box 2: demographic shifts[4]

Increases in life expectancy and the old age dependency ratio affect the ability of individuals to support their own retirements, and taxpayers to fund state pensions and pensioner benefits. Increases in healthy life expectancy affect the length of time people are capable of staying in work before they retire. These shifts provide part of the Government's rationale for increases in State Pension age.



Life expectancy: In 2017, a 65 year old man can expect to live on average to age 87.4 and a 65 year old woman to age 89.9. When the State Pension was introduced in 1925, a 65 year old man could expect to live to around age 76.

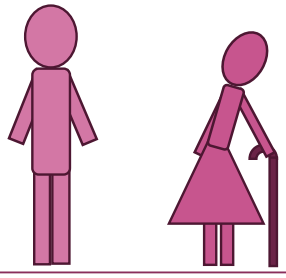
Dependency ratio: In 2017 there are 314 people over State Pension age for every 1,000 people of working age. This is projected to grow to 366 to 1,000 by 2046.

Health expectancy: Babies born in 2009/11 are likely to spend 3.5 years (boys) and 3.7 years (girls) longer in good health than babies born in 2000/02. This means that younger generations should be capable of working longer, on average, than older generations.

[4] Cohort life expectancy: ONS, 2014-based projections; Dependency ratio: Population estimates and 2008-based principal population projection, ONS; Healthy life expectancy: ONS 2014

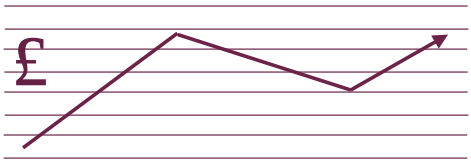
## Box 3: market changes

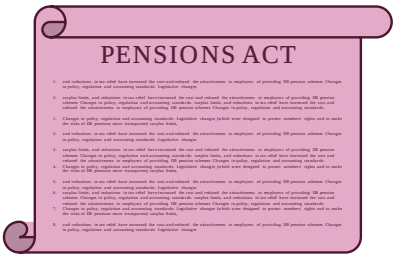
Defined Benefit (DB) pension schemes historically dominated private sector pension provision. In 1967 there were around 8 million active members in private sector DB.[5] Private sector DB membership has declined to around 1.4 million active members by 2017 by which time over 87% of schemes were closed to new members or both new members and future accruals.[6] Scheme closures can be attributed to several factors:



Increases in life expectancy: Pensioner members are living for longer and requiring pension payments for longer than originally anticipated.

Economic effects: the financial crisis has impacted fund returns, while low bond yields have increased the estimated value of liabilities. This has contributed to a shortfall between funding levels and estimated future costs.




Changes in policy, regulation and accounting standards: Legislative changes (which were designed to protect members' rights and to make the risks of DB pensions more transparent) surplus limits, and reductions in tax relief have increased the cost and reduced the attractiveness to employers of providing DB pension schemes.

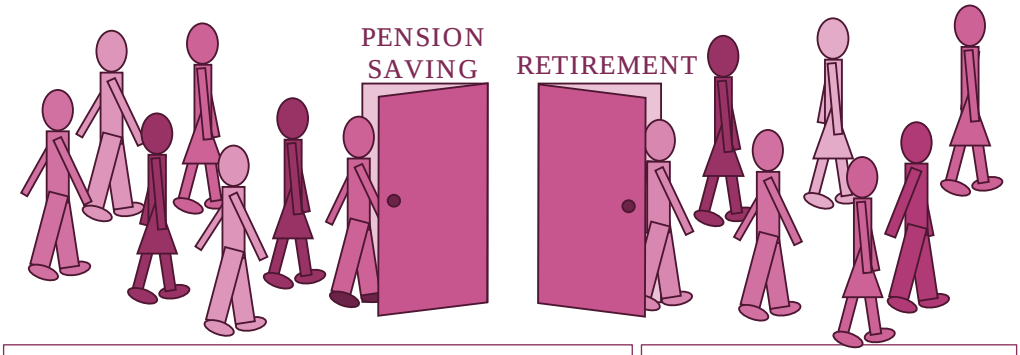
As DB schemes became more problematic for private sector employers the less risky and generally less expensive DC model became more attractive. As a result of this, and automatic enrolment, the number of active savers in DC schemes has increased rapidly and has overtaken the number of active DB savers. In 2017 there are around 12.8 million active members in DC schemes compared to around 1.4 million active members in private sector DB schemes.[7]

[5] PPI (2012b)
[6] PPF, TPR (2016)
[7] PPI Aggregate model

## Box 4: policy changes

Automatic enrolment: Automatic enrolment, rolling out in a staged process from 2012 to 2018, requires employers to enrol qualifying employees into a workplace pension. Employees can opt out. For those who stay in, employers are required to make minimum contributions on a band of earnings (£5,876 - £45,000 2017/18). Over 8.3m people have been automatically enrolled so far.

New State Pension: From April 2016 the basic and additional State Pensions were replaced with a new single-tier, flat-rate pension set at a level above Pension Credit, (£159.35 per week for a single pensioner in 2017/2018). The full rate of new State Pension is £159.55 per week for those with a 35 year National Insurance record.




Freedom and Choice: Since April 2015, people have had greater flexibility when they come to access DC pension savings after age 55. Prior to these changes, people with DC savings who could not demonstrate a minimum level of secure income were required to use a secure retirement income product, for example, an annuity, in order to access their DC pension savings.

Increases to the State Pension age (SPa): The SPa is rising for women from age 60 in 2010 to age 65 by 2018. SPa for both men and women will rise to age 66 by 2020, age 67 by 2028 and age 68 by 2039.

## Box 5: regulatory changes

- Charge Cap: In 2015 the Government introduced a charge cap on default funds used by automatic enrolment qualifying schemes to 0.75% of funds under management. The cap applies to all investment and administration charges. Transaction costs (third-party costs generated when shares are bought and sold on the market) are excluded from the charge cap.[8]
- Independent Governance Committees: Since April 2015, contract-based pension scheme providers have been legally required to set up and maintain Independent Governance Committees (IGCs). IGCs are responsible for overseeing the governance of contract-based pension schemes, ensuring that they act in the best interests of members and provide "value for money".[9]
- New trustee requirements: Since April 2015, trustees of trust-based DC pension schemes have been required to ensure that default arrangements

[8] The Occupational Pension Schemes (Charges and Governance) Regulations 2015
[9] PPI Briefing Note 80 'Independent Governance Committees'

are designed in members' best interests; financial transactions are prompt and accurate; and charges and costs are assessed for "good value" for members.[10]

- Master trust regulation: The 2017 Pension Schemes Act provides for the introduction of an authorisation and supervision regime for master trusts which will apply to new and existing schemes.[11]

### Demographic, market and policy changes affect needs and resources in retirement (see boxes 2-5)

The above shifts affect the needs and resources of, and the risks faced by, people at and during retirement. Future retirees will:

- Live longer,
- Take their State Pension later,
- Be more likely to reach retirement with DC savings (and no or low levels of DB entitlement), and
- Have near total flexibility in regard to accessing their savings.

Greater numbers of DC savers, coupled with flexibility of access, increases the risk and complexity that people with pension savings face at and during retirement.

[10] www.legislation.gov.uk/ukdsi/2015/9780111128329/pdfs/ukdsiem_9780111128329_en.pdf; TPR (2016b), In July 2016, TPR issued an updated DC 'Code of Practice 13: Governance and administration of occupational trust-based schemes providing money purchase benefits'. The purpose of the DC Code is to ensure trust-based schemes are effectively run, durable and offer value for members.

[11] services.parliament.uk/bills/2016-17/pensionschemes.html

# Chapter two: What does the DC landscape look like?

This chapter makes use of available data and PPI analysis to paint an overall picture of the current Defined Contribution (DC) landscape.

## Automatic enrolment

Automatic enrolment, which requires employers to enrol eligible employees into a qualifying pension scheme, is nearing the end of its rollout. Employees have a window of opportunity to opt-out and receive back any contributions already made. Automatic enrolment staging began in 2012. Current staging dates are as follows:

- From January 2016 employers with fewer than 30 employees began to automatically enrol,
- From May 2017 employers who came into existence after April 2012 began automatically enrolling,
- Under the current timetable all complying employers will have commenced automatically enrolling eligible employees by February 2018,
- After February 2018 new employers will have an instantaneous duty to automatically enrol eligible employees.

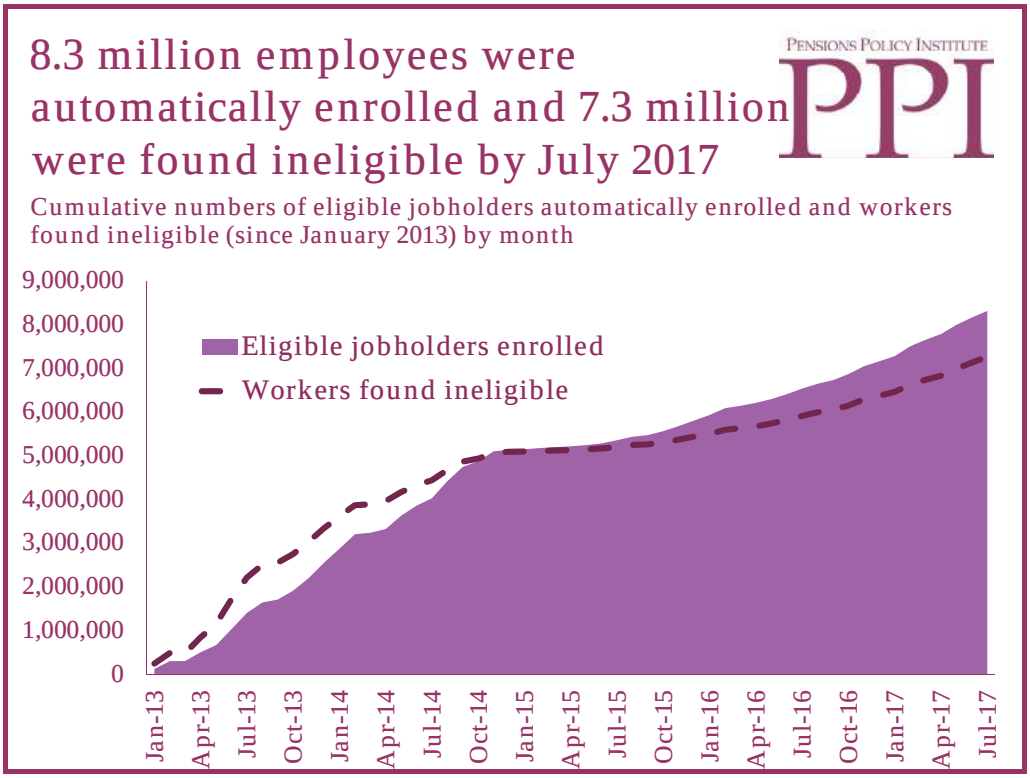
## Employees and automatic enrolment

To qualify for automatic enrolment an individual must be employed, aged between 22 and their State Pension age, and earning £10,000 per year or above in a single job (2017/2018). For employees who are automatically enrolled and do not opt-out, and for some employees who opt-in, employers are required to make a minimum 1% level of contributions on a band of earnings. For 2017/2018 the lower level of the qualifying earnings band for contributions is £5,876 and the upper level is £45,000.[12]

### 8.3 million people were automatically enrolled at their employers staging date by July 2017

By July 2017, 8.3 million employees were automatically enrolled at their employers staging date. However, a further 7.3 million were found ineligible due to age or earnings (Chart 1).

Chart 1[13]




Employers are required to re-enrol all eligible workers three years after they opt-out the first time. By July 2017, 469,000 employees had been re-enrolled (Chart 2).

[12] www.autoenrolment.co.uk

[13] TPR (2017b), automatic enrolment numbers contain some duplication arising from people leaving jobs after being automatically enrolled and being automatically enrolled again in new jobs, however they do not include figures from those automatically enrolled after an employer's staging date.

Chart 2[14]


### The current automatic enrolment opt-out rate is 9%

People have the opportunity to opt-out within one calendar month of being automatically enrolled. Opt-out levels have been lower than expected at around 9%. The Government currently expects opt-outs to average 15% by the end of 2018 (because opt-outs may rise as minimum employee contribution levels phase up to 4% by 2019).[15] There is little data available on opt-outs over the last few years. The Future Book 2018 will provide an update as more information will be released in 2018.

### Women, older, part-time and SME workers are more likely to opt out

The Future Books 2015 and 2016 found that older workers, those in part-time work and women are more likely to opt-out[16] as are those working for the smallest employers and those automatically enrolled into the National Employment Savings Trust (NEST).[17] There may be cross-overs between these groups as NEST has a public service obligation to accept members that other schemes do not wish to take on.

### Opt-in rates vary by scheme size

Ineligible employees may opt-in once their employer has reached its staging date. Those earning above £5,876 are eligible for employer contributions, those

[14] TPR (2017b)
[15] DWP (2016b)
[16] DWP (2014)
[17] DWP (2016b) table 4.3, "master trusts" does not include NEST

earning below are not, though their employer may choose to pay contributions anyway. In 2015, 5% of employees had opted-in to their employer's pension scheme.[18] However, a larger proportion of ineligible employees are now participating in workplace pension saving than can be accounted for by opt-ins (even accounting for pre-automatic enrolment saving) suggesting that some employers may be automatically enrolling all employees, including those ineligible.[19]

### 77% of eligible employees saved in a pension for at least three of the last four years

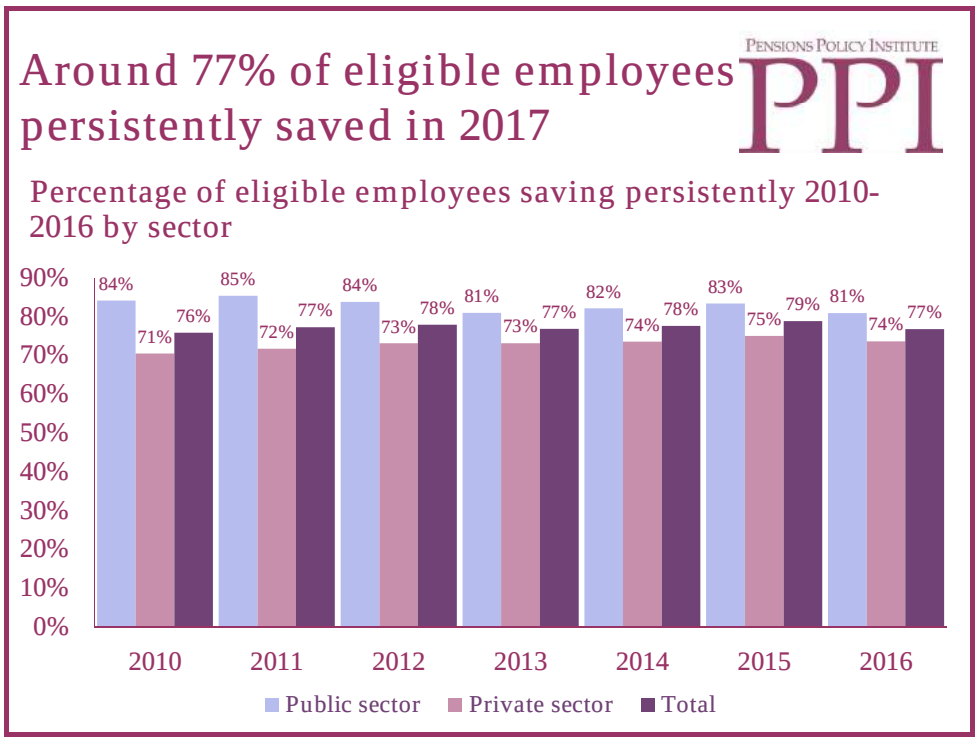
Some people cease contributing to their scheme after their one month opt-out period has expired. This could be because they:

- Leave their current job (and may be automatically enrolled in a new job),
- Fall below the eligible earnings band lower limit, or
- Do not wish to contribute into their automatic enrolment pension scheme but did not opt-out in time.

Therefore it is useful to look at the "persistence rate", the proportion of people automatically enrolled who contribute regularly into their pension. In order to measure persistency among the eligible population, the DWP tested the proportion of eligible employees contributing into a workplace pension for at least three out of a period of four years (Chart 3).

[18] DWP (2016b) table 4.2
[19] IFS (2016a)

Chart 3[20]



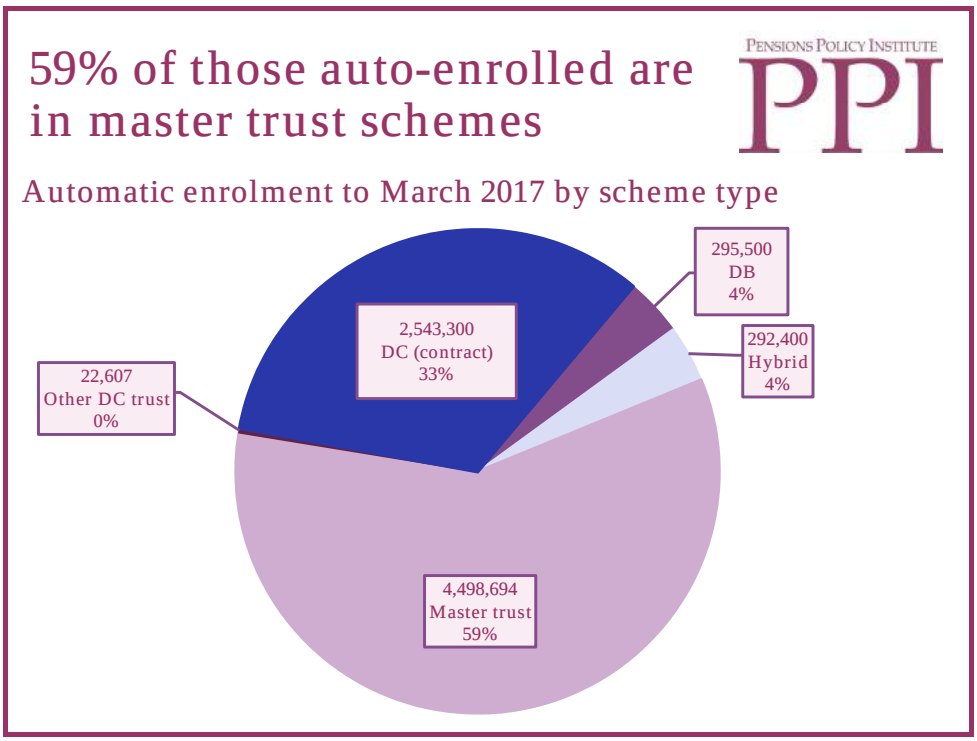

Persistency in pension saving has remained relatively steady over the last six years: at 76% in 2010 and 77% in 2016. However, persistency in the public sector declined from 84% to 81% between 2010 and 2016 while it increased in the private sector from 71% to 74%. This might be because those automatically enrolled in the public sector are more likely to have already opted out once on starting their job and are therefore pre-disposed to opt-out again, whereas those in the private sector are less likely to have made a previous opting-out decision.

### Scheme type: Over half of those automatically enrolled have been enrolled into master trust schemes

Employers have a choice into which scheme they enrol their employees. The provision of Defined Benefit (DB) schemes has dwindled in the private sector, and private sector employers are more likely to automatically enrol employees into Defined Contribution (DC) schemes. The use of DC schemes, specifically master trusts, has risen dramatically with automatic enrolment (Chart 4).

[20] DWP (2017) Table 1.13

Chart 4[21]



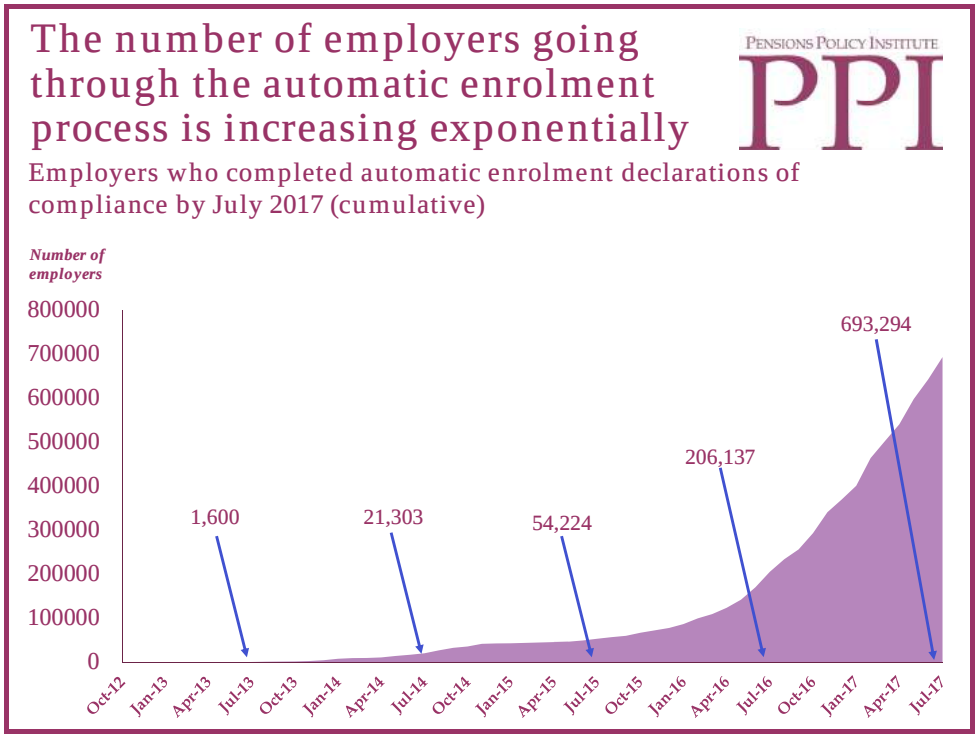

Of 7.7 million workers automatically enrolled by 31 March 2017, 92% were enrolled into pure DC schemes and more than half, 59%, were enrolled into master trust schemes, up from 49% in March 2016.

[21] TPR (2017c)

## Employers and automatic enrolment

The majority of employers are small, and as smaller employers are now automatically enrolling, the total number going through the process has increased exponentially from four in the first month (Oct 2012) to 693,294 by 31 July 2017. By the end of the automatic enrolment process, around 1.3 to 1.5 million employers will have been through the automatic enrolment process (Chart 5).[22]

Chart 5[23]




The number of employers going through the automatic enrolment process has increased and therefore you would expect the number of compliance and penalty notices to increase. The proportion of employers receiving a penalty notice has increased, from 3% of employers in 2014 to 12% of employers by the end of March 2017. By March 2017 the yearly number issued had already eclipsed the total for 2016 (Table 1).

[22] TPR (2016d)
[23] TPR (2017b)

Table 1: cumulative number of notices issued by The Pensions Regulator (TPR) by time period[24]

| | Compliance notice | Unpaid contribution notice | Fixed penalty notice | Escalating penalty notice | Proportion of employers receiving a notice |
|---|---|---|---|---|---|
| By end 2014 | 1,316 | 8 | 169 | 0 | 3% |
| By end 2015 | 4,818 | 224 | 1,594 | 31 | 8% |
| By end 2016 | 31,680 | 1,107 | 9,831 | 1,477 | 12% |
| By March 2017 | 40,206 | 1,592 | 14,502 | 2,517 | 12% |

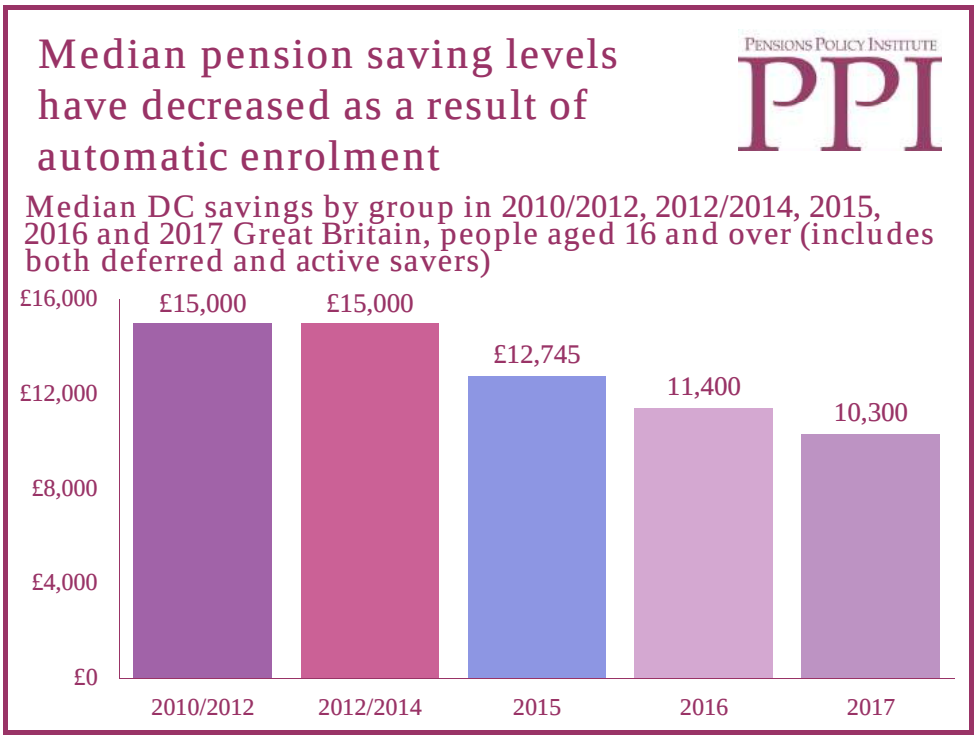
The increase in notices suggests that smaller employers are finding compliance more difficult than large employers. This is unsurprising as small employers are less likely to have pre-existing in-house pension administration systems and are less likely to be aware of their ongoing duties in relation to automatic enrolment. In 2015, 88% of micro employers, 90% of small and 96% of medium employers were aware of their ongoing duties.[25]

[24] TPR – compliance and enforcement quarterly bulletins for the relevant periods
[25] OMB, TPR (2017)

## DC saving levels

Between 2010-2012 and 2017, the median DC pot size decreased from £15,000 to £10,300 as a result of millions of people being automatically enrolled and accruing initially small pension pots. Over time, median pot sizes will increase as contributions and investment returns have a chance to embed and grow (Chart 6).

Chart 6[26]




[26] ONS (2015)

## DC asset allocation

The next section explores how assets are allocated within pension schemes.

### Box 6: fund labelling

Many asset mixes are labelled as "funds" but consist of several different asset classes. Therefore, it is more accurate to describe asset mixes as "strategies" rather than "funds", for example high-risk, low-risk or lifestyle strategies.

Asset mixes might be labelled as "high-risk", "low-risk", "lifestyle" or "retirement-date" funds, though the structure of each will vary depending on the scheme that is offering it. Most schemes will offer a variety of funds alongside the default fund. Descriptions of the main types are given below.

Default funds: The default fund is the asset mix that members will automatically have their contributions invested in, unless they make an active choice to invest in a different fund. Charge cap regulations define default funds more specifically.

Lifestyling, target-date or retirement-date funds: These asset mixes usually involve life-cycle investment strategies which make greater use of more volatile, equity-based investments in order to maximise returns when members are further from retirement age, and increasing use of less volatile assets which are weighted towards cash and fixed-income as members reach a pre-determined retirement date (or period), on the assumption that they will use their DC savings to purchase a retirement income product. Some of these funds use lower risk investments in earlier stages of accumulation in order to accommodate members' lower risk appetites.

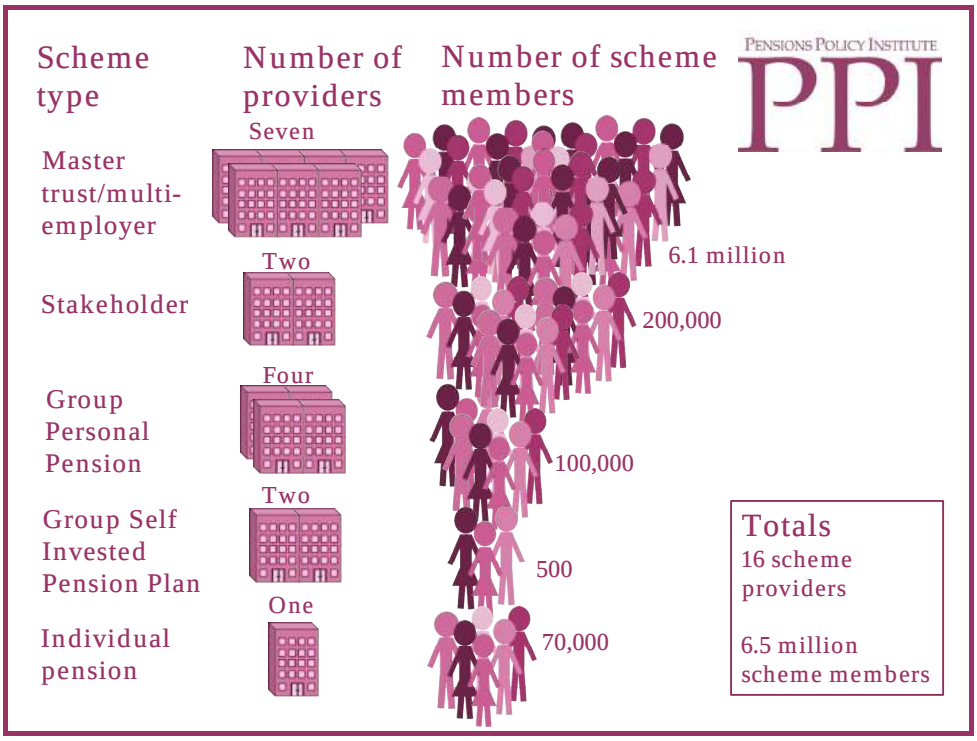
High-risk, medium risk and low-risk funds: These asset mixes may be used as part of other investment strategies or might be stand-alone. High-risk funds involve greater use of equities, and other economically sensitive assets, which are more volatile but offer greater opportunity for investment return. Low-risk funds are mainly bond and/or cash-based. Medium-risk funds offer a balance between the two.

Diversified (multi-asset) funds: These asset mixes are designed to minimise the risk of great losses during market downturns by investing capital in a variety of asset classes (e.g., bonds, equities, property, commodities etc.). Diversified funds allow for growth through returns but will not generally accrue returns as substantial as more heavily equity based funds. However, diversified funds are also intended to be less likely to suffer severe losses than funds heavily invested in equities.

## Fund membership and value

The following data is based on the results of the ***PPI DC Assets Allocation Survey 2017***. The participating schemes collectively contain more than 6 million DC members, representing around half of the membership of DC workplace pension schemes (Chart 7).

Chart 7[27]




### Members of master trust/multi-employer schemes are more likely to be invested in the default fund

In 2017 most respondents' default funds employed a lifestyle/target date strategy. Master trust/multi-employer schemes had a higher proportion of total members invested in the default fund at 99.7% on average (Chart 8).

### Group Personal Pension (GPP) default funds have the highest asset value

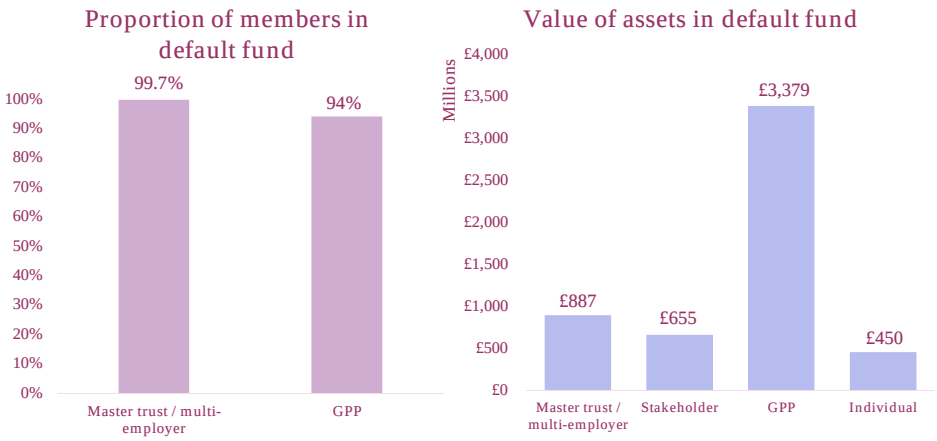
Default funds in GPP schemes had the highest asset value at £3.4 billion on average (Chart 8). This is because most GPP funds have been set up for longer than most master trust/multi-employer schemes therefore allowing more time for funds to grow from contributions and investment returns.

[27] 2017 PPI DC Assets Allocation Survey

Chart 8[28]

## Master trusts have the highest proportion of members in the default fund but Group Personal Pension default funds have the highest average asset value

Average proportion of members and average value of assets in default fund by scheme type, 2017

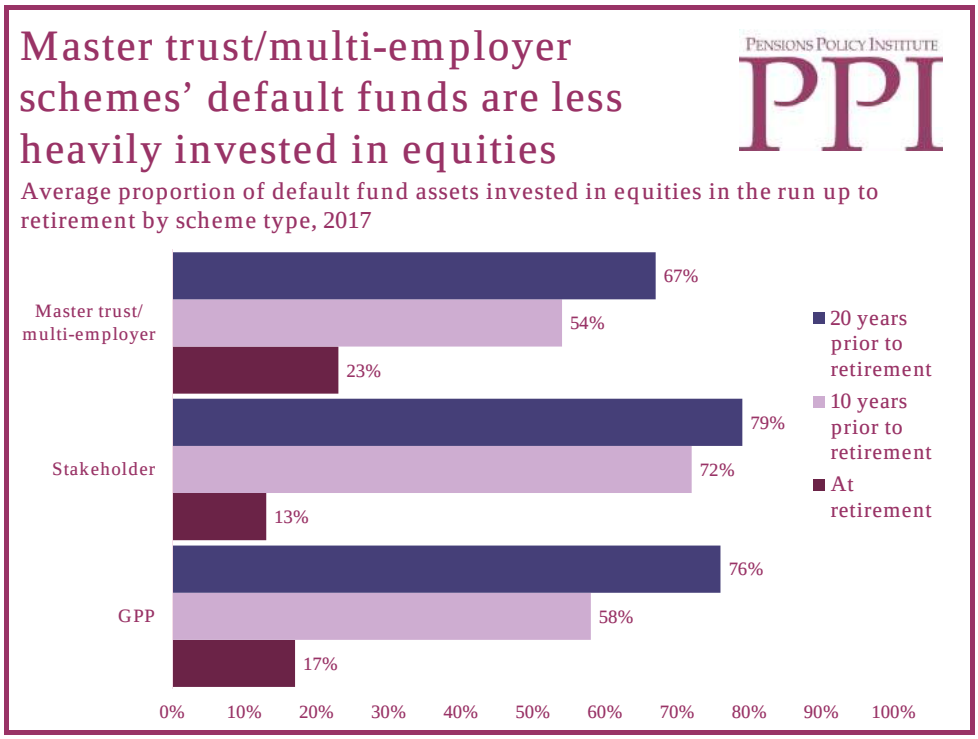



[28] 2017 PPI DC Assets Allocation Survey

## Investment strategies

There were a range of default fund investment strategies used by the different providers, most based around de-risking strategies. Though stakeholder investments appeared to be slightly less cautious 20 years prior to a member's retirement date and slightly less cautious 10 years prior, the range of funds invested in equities were fairly similar across all different scheme types. Master trust / multi-employer schemes have a wider range of investment strategies than other schemes and tended to have higher fund levels invested in equities at retirement than other schemes (Chart 9, Table 2).

Chart 9[29]




[29] 2017 PPI DC Assets Allocation Survey – number may not always total due to rounding at source or during analysis

Table 2: average proportion of default fund assets by scheme and asset class 20 years prior to retirement, 10 years prior to retirement and at retirement (rtm)

| Scheme type | Equities | | | Fixed income | | | Cash | | | Other (real estate, commodities) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20 yrs | 10 yrs | at rtm | 20 yrs | 10 yrs | at rtm | 20 yrs | 10 yrs | at rtm | 20 yrs | 10 yrs | at rtm |
| Master trust/ multi-employer | 67% | 54% | 23% | 15% | 27% | 47% | 3% | 3% | 27% | 16% | 19% | 9% |
| Stakeholder | 79% | 72% | 13% | 16% | 24% | 59% | 4% | 4% | 28% | 1% | 1% | 1% |
| GPP | 76% | 58% | 17% | 16% | 31% | 65% | 4% | 3% | 30% | 10% | 8% | 2% |
| Individual | 85% | 70% | 0% | 15% | 30% | 75% | 0% | 0% | 0% | 0% | 0% | 0% |

Default fund investment strategies vary, though the majority of schemes pursue a lifestyle strategy by investing more heavily in equities during the earlier years of saving and shifting towards fixed income and cash as people get closer to their retirement date. In the ***2017 PPI DC Assets Allocation Survey***:

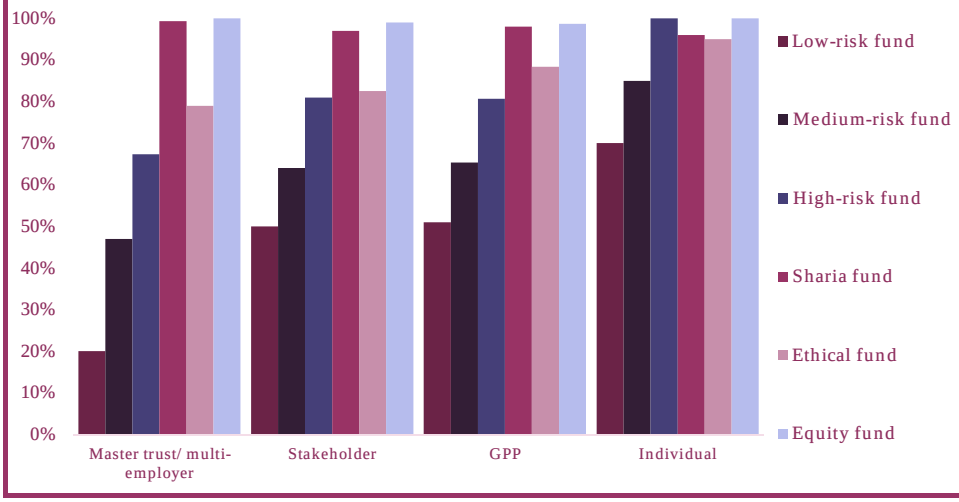
- Master trust and multi-employer schemes invested less in equities than other schemes with an average of 67% of default funds invested in equities 20 years prior to retirement compared to between 76% and 85% for other scheme types. This partly reflects the lower risk appetite in the earlier stages of saving among master trust scheme members.
- Master trust default funds had a higher proportion of assets in "other" classes such as real estate, commodities and infrastructure. The 2018 PPI DC Assets Survey will gather more detailed data on the spread of assets within these classes.

Individual and group personal pension schemes tend to invest more assets in equites for low, medium, high risk and ethical funds while all schemes have a high equity base for Sharia and equity funds (Chart 10).

Chart 10[30]

## Master trust funds are generally less heavily invested in equities

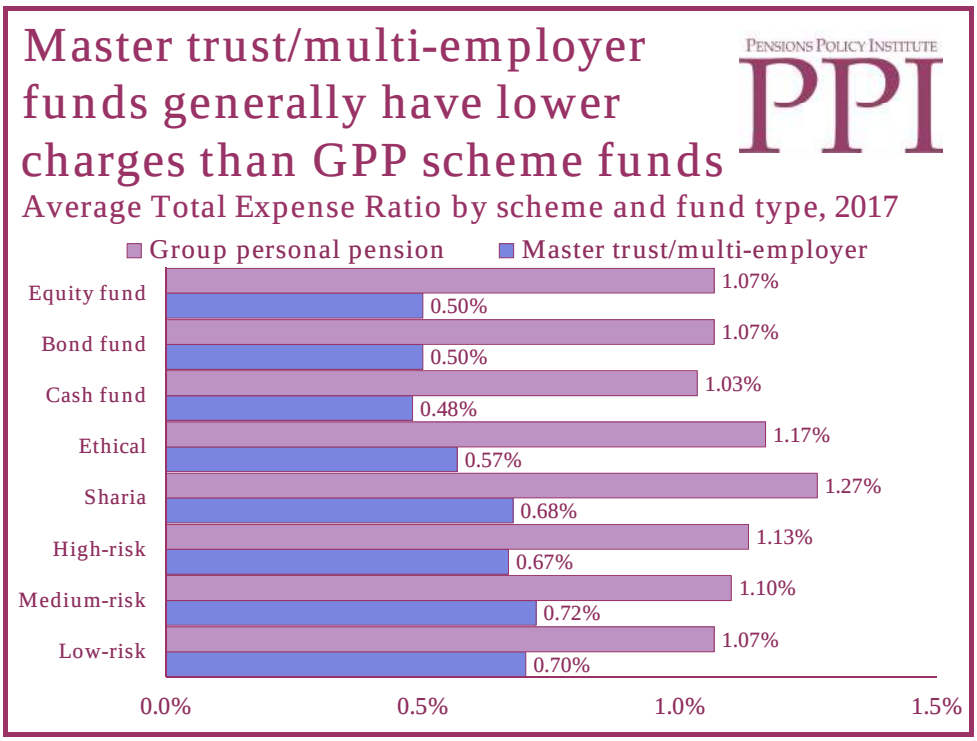
### Range of assets invested in equities by fund and scheme type, 2017




In the 2017 survey, Total Expense Ratios (TERs) in non-default funds were lower in master-trust / multi-employer schemes than they were in GPP schemes. This is mainly due to the charge cap applied to automatic enrolment scheme default funds. Members of GPP schemes are more likely to have actively chosen a non-default fund and to have started saving prior to automatic enrolment (Chart 11).

[30] 2017 PPI DC Assets Allocation Survey

Chart 11[31]




[31] 2017 PPI DC Assets Allocation Survey

## Contributions

The required level of contributions that employers and workers (who do not opt-out) must jointly make into a pension scheme under automatic enrolment legislation is being phased in to reach 8% minimum total contributions on band earnings (£5,876 - £45,000 in 2017/18)[32] by 2019. Current employee/employer contributions are below 8% of band earnings on average.

### What is a sufficient level of contribution?

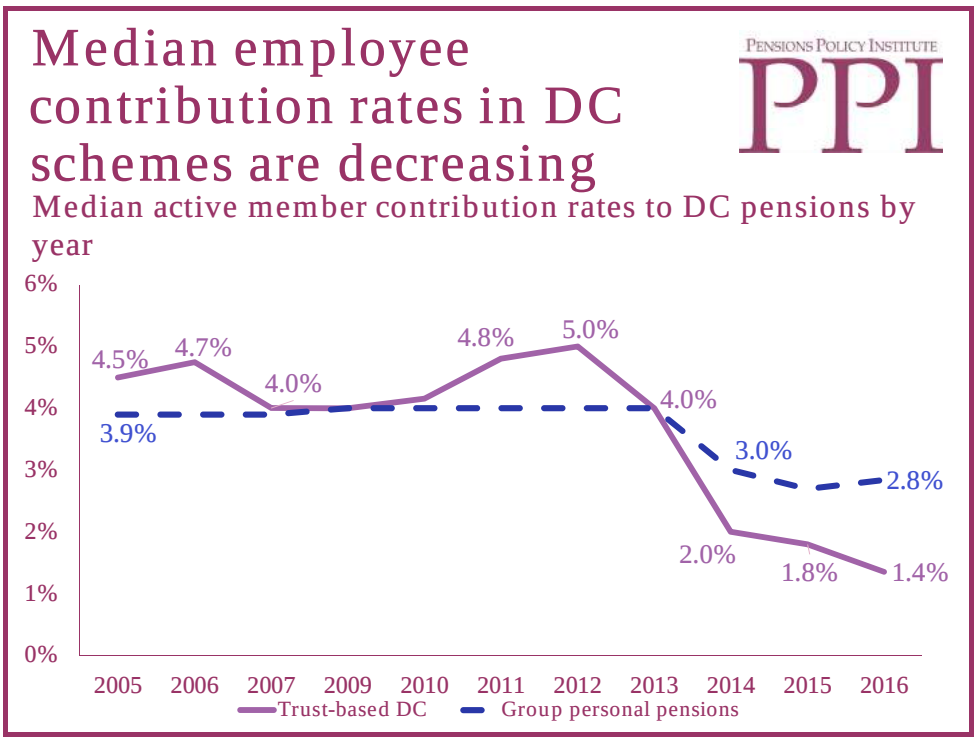
Contributions of 8% of band earnings may not be sufficient for members to achieve an acceptable standard of living in retirement. A median earner contributing 8% of band earnings into a pension scheme every year from age 22 until State Pension age (SPa) would only have a 50% chance of achieving the same standard of living in retirement that they experienced in working life (from private and State Pension income).[33] In many cases, people will not contribute steadily for their entire working life and would require a higher percentage of contribution to achieve a 50% likelihood of replicating working life living standards.[34]

A median earner might need to contribute between 11% and 14% of band earnings to have a two thirds chance of replicating working life living standards if contributing between age 22 and SPa. For people who begin contributing later or who take career breaks, contribution levels could be as high as 27% for people to have a two thirds chance of replicating working life living standards.

Median employee contribution rates are falling as a result of more employees joining pension schemes for the first time and paying minimum contributions alongside their employers (Chart 12). However, this does not mean that pre-automatic enrolment savers are paying less. As minimum contributions increase, median levels should rise to above 8%. Since automatic enrolment mean contribution rates have risen by 1.05% (0.45% from employees and 0.6% from employers) as a result of more people saving in pension schemes.[35]

[32] DWP (2015a)
[33] Assuming State Pension is uprated in line with triple lock and that people purchase an annuity with their private pension savings
[34] PPI (2013), assumes median earnings at every stage of working, based on Pension Commission replacement rates.
[35] IFS (2016b)

Chart 12[36]

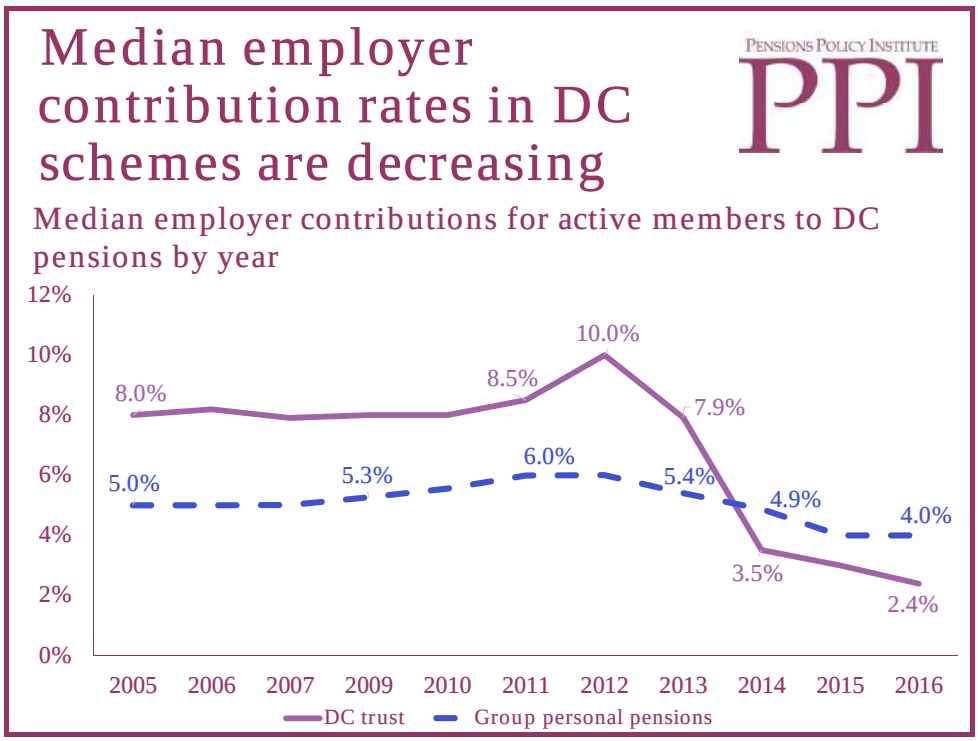



Employee contribution rates dipped from 4% and 5% (GPPs and DC trusts) in 2012 to 2.8% and 1.4% in 2016. The median is likely to increase again once higher contribution levels are phased in through automatic enrolment.

Median employer contribution rates have also decreased since 2012 (Chart 13).

[36] ONS data analysis by the Resolution Foundation. This work contains statistical data from ONS which is Crown Copyright. The use of the ONS statistical data in this work does not imply the endorsement of the ONS in relation to the interpretation or analysis of the statistical data. This work uses research datasets which may not exactly reproduce National Statistics aggregates

Chart 13[37]




Median employer contribution rates have decreased from 10% (DC trust) and 6% (GPPs) in 2012 to 2.4% and 4% in 2016. DC trust schemes have seen the biggest drop as master trusts are more likely to be used by employers enrolling employees for the first time and paying minimum contribution levels.

[37] ONS data analysis by the Resolution Foundation. This work contains statistical data from ONS which is Crown Copyright. The use of the ONS statistical data in this work does not imply the endorsement of the ONS in relation to the interpretation or analysis of the statistical data. This work uses research datasets which may not exactly reproduce National Statistics aggregates

## Levelling down

Automatic enrolment represents a cost to employers[38] because of the administrative burden of ensuring scheme compliance and employee eligibility and the cost of employer contributions. Employers respond in different ways to increased costs, for example by:

- Raising the price of their products,
- Reducing wage increases,
- Building the costs into their budget without reducing costs elsewhere,
- "Levelling down" their pension offering, either by reducing the percentage they contribute towards existing pension scheme members to match those who are being automatically enrolled or by changing contribution or scheme terms for new members.[39]

Between 2012 and 2015 the proportion of eligible employees who were in schemes that were being levelled down grew from 6% to 9%.[40]

[38] Whether they already offered a pension scheme or not
[39] DWP (2016a) Box 3.1
[40] DWP (2016a); DWP (2015b)

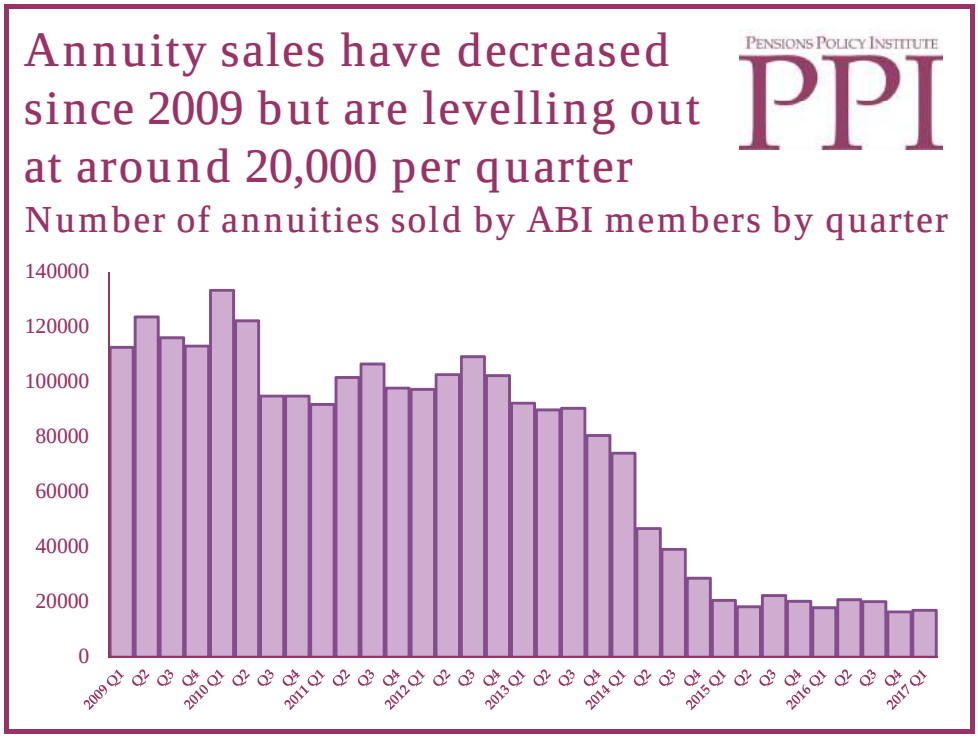
## Accessing DC savings in retirement

### Annuities

Prior to the introduction of the new pension flexibilities "Freedom and Choice" the majority of people used their DC savings to purchase an annuity. In 2012 over 90% of DC assets being accessed were used to purchase annuities. Overall sales of annuities peaked in 2009 at around 466,000. However, since then, they have been declining.[41]

When the pension flexibilities were introduced annuity sales declined more rapidly, but have recently levelled out at around 20,000 sales per quarter. 6% of those accessing DC savings in 2015 purchased an annuity (Chart 14). Between Q2 of 2015 and Q3 of 2016 the average amount invested in an annuity was £58,100.[42]

Chart 14[43]



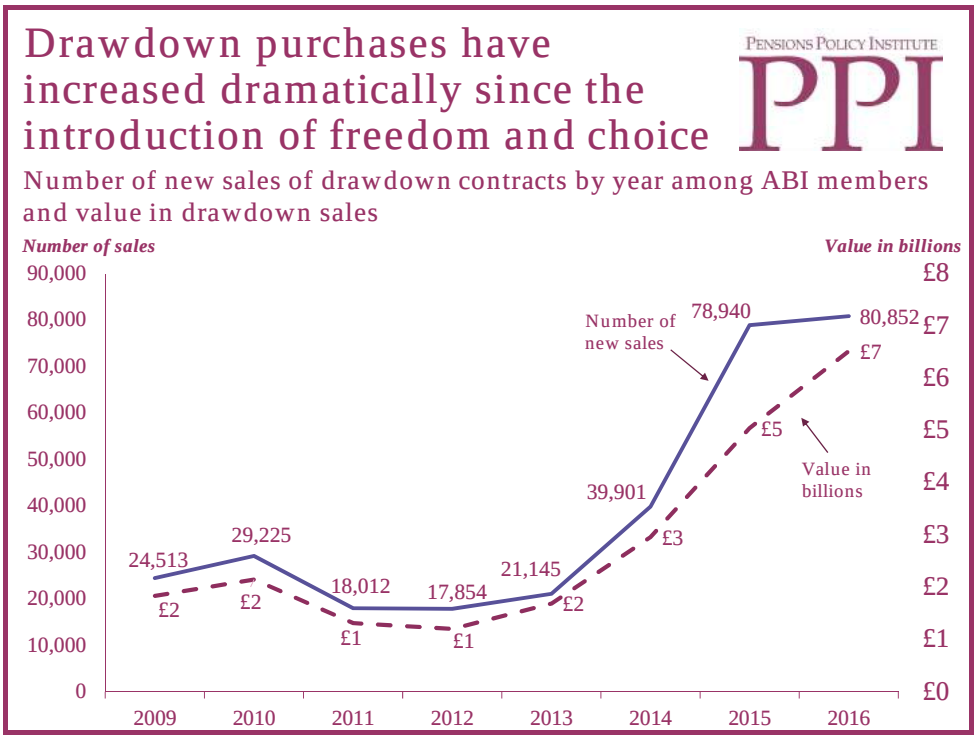

[41] ABI (2015a)
[42] FCA (2015)
[43] ABI statistics

## Income drawdown

The use of income drawdown was fairly consistent between 2010 and 2014, with around 20,000 new contracts each year.

- In 2014, after the announcement of freedom and choice, the number of sales doubled to almost 40,000 new contracts.
- In 2015 the sales of drawdown products almost doubled again to around 79,000 products.
- In 2016, the number of products sold plateaued at around 80,000 (Chart 15).

Chart 15[44]

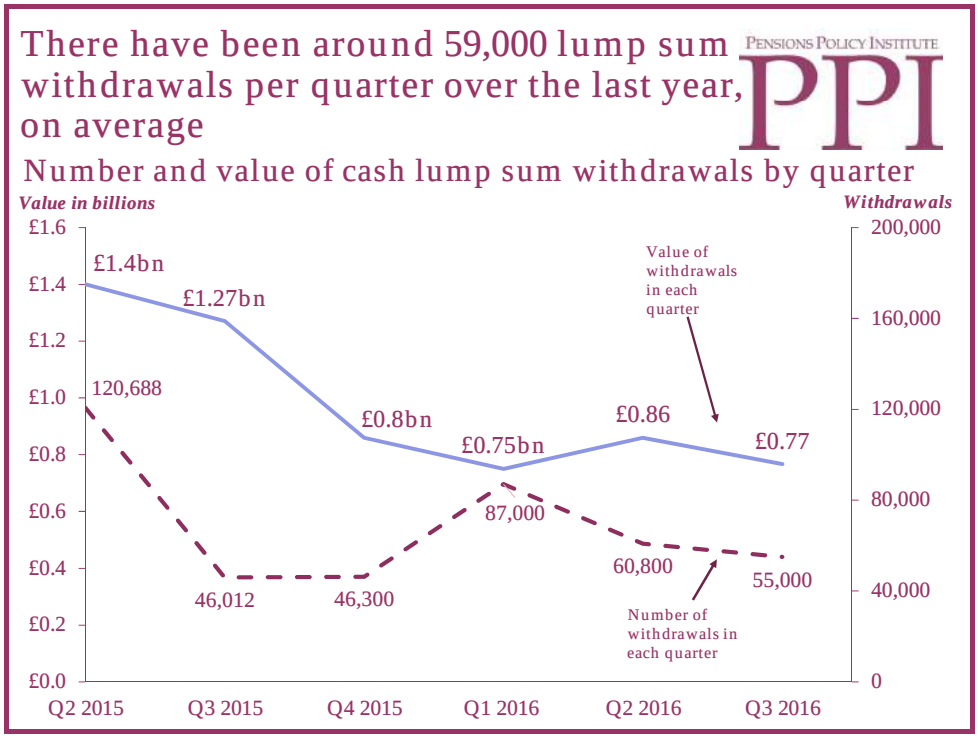



[44] ABI (2017); ABI (2016a); ABI (2016b); ABI (2015a); ABI (2015b)

## Lump sums

Since April 2015, all those over age 55 can withdraw cash lump sums from their DC savings, taxed at their highest marginal rate of income tax, with 25% tax-free.[45] The number of lump sum withdrawals was initially high at 120,688 in Q2 2015, but then decreased to an average of 59,000 per quarter between Q3 2015 and Q4 2016 (Chart 16).

Chart 16[46]




55,000 withdrawals worth a total of £770 million was withdrawn in lump sums in Q3 2016. There is still a reasonable amount of variability in the number of withdrawals taken each quarter and so it is not yet clear what the overall trend might be.

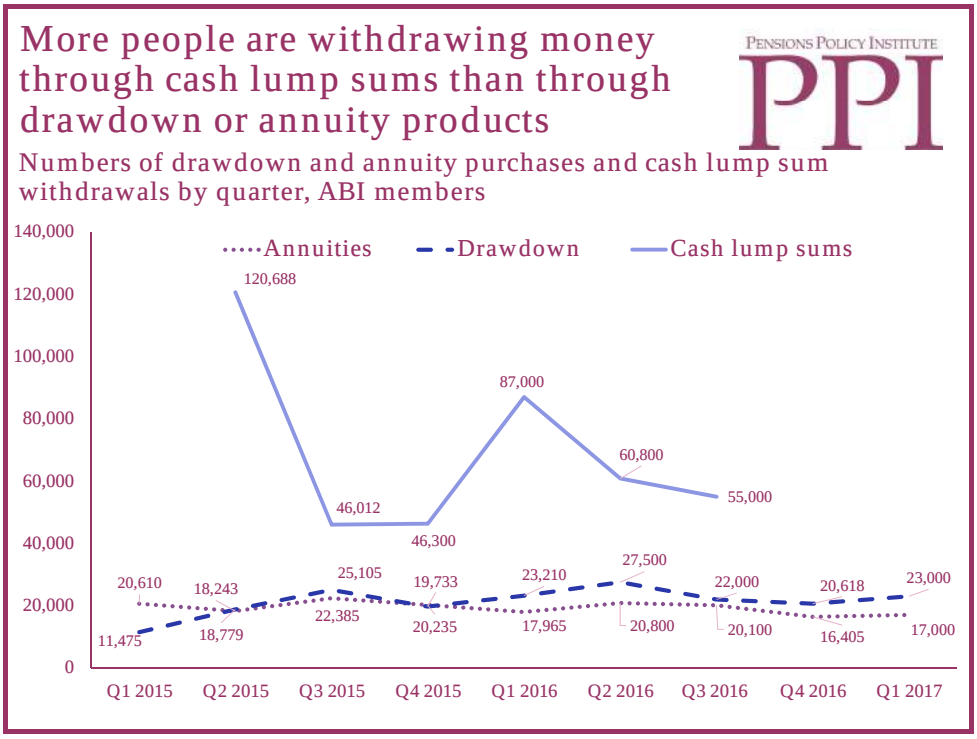
[45] Prior to April 2015, only those with DC pots under £15,000, (£18,000 in 2015) could withdraw their entire fund as a lump sum without incurring a tax penalty

[46] ABI (2017); ABI (2016a); ABI (2016b); ABI (2015a); ABI (2015b); figures for 2016 Q2 and Q3 are for total withdrawals, preceding figure include both.

## DC savings access trends

More people are taking cash lump sums in each quarter than are buying annuity or drawdown products. In Q3 2016, more people took cash lump sums than the number who bought drawdown or annuity products combined (Chart 17).

Chart 17[47]



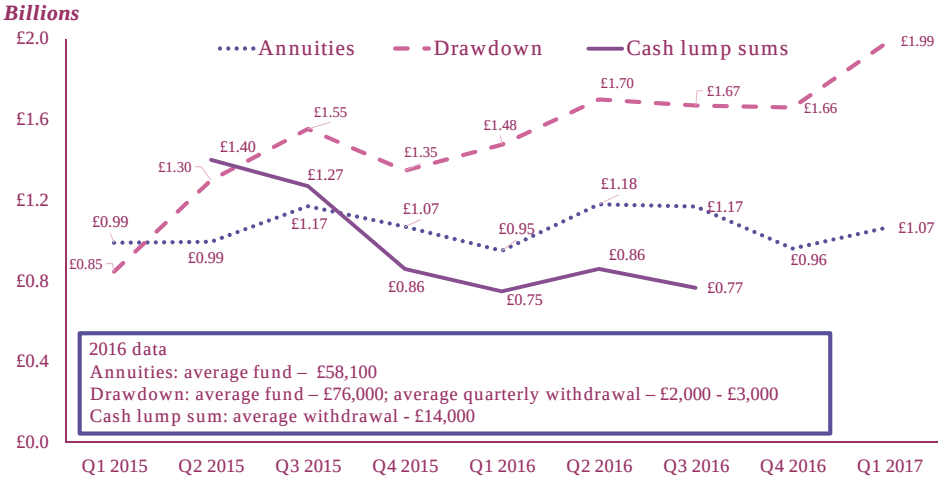

However, those taking out annuity or drawdown contracts tend to do so using larger funds than those taking lump sum withdrawals. In 2016, the average fund size used to enter drawdown was £76,000, the average fund used to purchase an annuity was £58,000 and the average lump sum withdrawal was £14,000 (Chart 18).

[47] ABI statistics; ABI (2016a)

Chart 18[48]

## People are spending more money on drawdown products than on annuities or lump sum withdrawals

Value of retirement income products and cash lump sum withdrawals by quarter (billions), ABI members




Source: ABI stats

[48] ABI statistics

## DB transfers

Increased flexibility has encouraged some people to transfer their DB entitlement into a DC scheme, in order to be able to withdraw their pension savings flexibly. While transferring may benefit some people, there are two main risks associated with transfers from DB to DC:

- Individual risk: if people transfer out of a DB scheme when it is not in their best financial interest to transfer.
- Scheme risk: substantial transfers from DB schemes could cause schemes to change or review their investment strategies. However, in some cases, transfers out could help scheme funding through reduction of liabilities.

The Financial Conduct Authority (FCA) reported in 2016, that since the introduction of the pension freedoms, the total number of requests to transfer from DB to DC[49] had tripled from those newly approaching Independent Financial Advisers (IFAs) for the first time, and doubled from existing customers.[50]

In 2017, a study of DB schemes showed that the number of transfers in January 2017 was 10 times the average number of monthly transfers between May 2013 and April 2014, before the announcement of the pension reforms, and that the value of transfers was 18 times the value of those in 2013/14.[51] The study found that:

- Those with transfer values over £500,000 are almost two times more likely to transfer than those with transfer values of £100,000 or less.
- In 2016/17, 54% of those who transferred invested some or all of their pension savings into drawdown, 43% bought an annuity, and 4% withdrew their funds as cash.
- 40% to 80% of those eligible to trivially commute their small DB pension and take it as a lump sum do so.[52]

[49] DB Scheme members with a cash equivalent transfer value of £30,000 or more must obtain independent financial advice before transferring their DB entitlement to a DC scheme
[50] FCA (2016)
[51] Willis Towers Watson (2017)
[52] Willis Towers Watson (2017)

## Advice and Guidance

### Box 7: what is the difference between advice and guidance?

Advice and guidance are subject to different regulatory requirements. The following definitions are provided by the FCA.[53]

Independent advice: "An adviser or firm that provides independent advice is able to consider and recommend all types of retail investment products [...] Independent advisers will also consider products from all firms across the market, and have to give unbiased and unrestricted advice. An independent adviser may also be called an 'independent financial adviser' or 'IFA'."

Restricted advice: "A restricted adviser or firm can only recommend certain products, product providers, or both. The adviser or firm has to clearly explain the nature of the restriction. […] Restricted advisers and firms cannot describe the advice they offer as 'independent."

Guidance or information: "If you are only given general information about one or more investment products, or have products or related terms explained to you, you may have received 'guidance' rather than 'advice'. This is sometimes also called an 'information only' or 'non-advice' service. The main difference between guidance and advice is that you decide which product to buy without having one or more recommended to you."

A greater cost is generally attached to the provision of independent (or restricted) advice, in return for the adviser or firm taking on some of the responsibility for the outcome of the advice offered. The use of guidance puts responsibility for the final decision making on the consumer, who also bears the risks of making a bad decision. Some financial transactions (such as purchasing drawdown products or transferring DB entitlement into a DC scheme) may require the use of independent financial advice.

The use of advice and guidance is likely to change in the future for a variety of reasons:

- The market has changed over the last few years as a result of the Retail Distribution Review, which in 2013 created greater delineation between Independent and Restricted Advice, as well as clarifying and restructuring charging so that more consumers bear total costs upfront. This policy may restrict access to consumers who find the new charging structure difficult to manage.
- The introduction of the pension flexibilities means that some people who previously would have bought an annuity will choose to access pension

[53] www.fca.org.uk/consumers/financial-services-products/investments/financial-advice/independent-and-restricted-advisers, accessed 07.08.2015

savings through other means. Some of these people may use advisers at and during retirement to help manage more flexible access methods.

- The introduction of the new pension flexibilities was accompanied by a new, national, guidance service known as "Pension Wise". Pension Wise offers free, tailored and independent guidance (online, by telephone or face-to-face; limited to a one-off 45 minute session at present), to those aged 50 or above with DC savings (Box 8).
- DC pension scheme members are now eligible for £500 of tax-free employer arranged advice and may take £500 from their pension pots up to three times, to use for advice.[54]

### Box 8: figures for Pension Wise[55]

Between early 2015 and July 2017 there have been 5 million visits to the website and around 141,000 completed incidences of guidance. 74% of these were face-to-face appointments and 26% were telephone appointments.

The customer satisfaction score from user feedback is currently 90%, though there is little available data yet on the choices people make after receiving guidance or on what the financial outcomes of these choices are.

### The financial services industry and the regulator are investigating new methods of providing advice

Some organisations offer web-based "robo-advice", which is aimed at people who would benefit from advice but may not have access because they cannot afford (or believe they cannot afford) regulated financial advice. Robo-advice uses algorithms to help answer money-based questions and should allow companies to offer advice more quickly and cheaply.

### Fewer people are using regulated advice when purchasing retirement income products

The use of regulated advice for those purchasing drawdown is decreasing:

- In 2016, 51% of those purchasing drawdown products used independent advice, a drop from 69% in 2015 and 81% in 2014.
- The proportion of drawdown purchases made without any advice has more than tripled from 9% in 2014 to 32% in 2016.[56]

The use of independent advice for annuity purchases remained fairly constant over the past three years at around 20%, though:

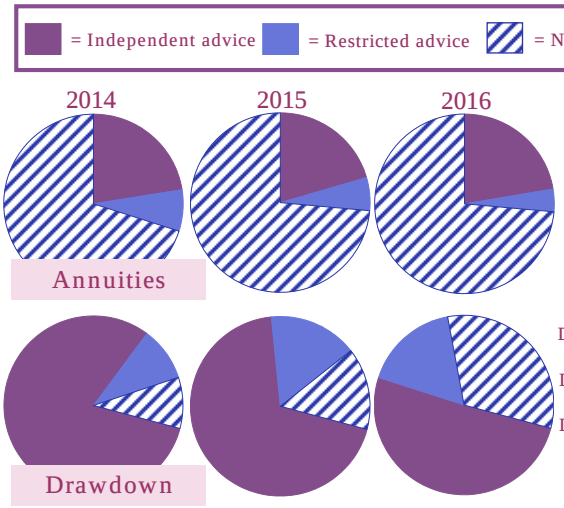
- The use of restricted advice has dropped by almost half since 2014, and
- The proportion of people buying annuities unadvised has grown from 70% to 74% (Chart 19).

[54] HMT, FCA (2016)
[55] www.gov.uk/performance/pension-wise
[56] The FCA is currently looking into whether more needs to be done to support people in the non-advised drawdown market, FCA (2017) ***Retirement Outcomes Review***

Chart 19[57]

## The proportion of people using independent or restricted advice when entering drawdown is decreasing

New annuity and drawdown contracts sold, 2014-2016, ABI members




| | Independent advice | Restricted advice | No advice |
|---|---|---|---|
| 2014 Annuities | 22% | 7% | 70% |
| 2015 Annuities | 20% | 6% | 74% |
| 2016 Annuities | 22% | 4% | 74% |
| 2014 Drawdown | 81% | 10% | 9% |
| 2015 Drawdown | 69% | 16% | 15% |
| 2016 Drawdown | 51% | 17% | 32% |

Purchasing retirement-income products without the use of advice or guidance increases the risk that individuals will not make optimal decisions for meeting their income needs in retirement.

[57] ABI Statistics – New business full product breakdown by quarters – numbers may not total due to rounding

# Chapter three: How might the DC landscape evolve in the future?

This chapter uses PPI modelling to explore how the Defined Contribution (DC) landscape might evolve in the future both for individuals and on an aggregate level.

### The evolution of the DC market depends on many factors

Previous chapters have set out the current state of the DC market and outlined the factors which are likely to lead to changes in the future, including: automatic enrolment, the private sector move from DB to DC schemes, the increased use of new pension flexibilities and changes to the way that advice and guidance are used and delivered.

The way that the DC market evolves in the future will also depend on how individuals respond to policies such as automatic enrolment and the new pension flexibilities, as well as external factors such as employer behaviour and the performance of the overall economy.

### Box 9: modelling

This report uses the PPI suite of models and data from the ONS' Wealth and Assets survey (Wave 4) to explore how DC assets may change and grow in the future under assumptions that current trends continue. The chapter also sets out the potential range of distribution of DC assets in the future, under a range of possible future economic scenarios (based on historical data).

The distribution and value of DC assets in the future depends on many variables:

- Employee behaviour - participation and contribution levels.
- Employer behaviour – contribution levels, scheme choice, remuneration decisions.
- Industry behaviour – charges, investment strategies, default offerings, new scheme development (e.g. Collective Defined Contribution schemes).
- Economic, demographic and financial market effects – market performance, inflation, age and size of the working population.
- Policy changes – policy changes which affect pension saving such as taxation, changes to minimum pension age, introduction of new scheme-types, or a policy of auto-escalation of contributions under automatic enrolment.

The model outputs should be viewed as an illustration of a range of potential scenarios arising from current trends, and not a prediction of the future. The analysis is intended to provide insight about the impact that certain behaviours and trends could have on the level of DC assets, rather than providing a firm prediction.

The following analysis explores how a continuation of current trends in DC saving could affect the membership numbers and the aggregate value of DC scheme assets in the future.

### How might scheme membership develop in the future?

Under automatic enrolment, employers can choose to use their existing workplace pension provision as long as it qualifies with regulations. Those without existing provision, or who wish to change their offering for new or existing members, have the choice to set up and run a DB, DC or Hybrid/risk-sharing scheme themselves or to offer membership in a DC scheme run by a third-party. Some employers offer a combination of these.

### Box 10: assumptions

The following analysis is based on the assumptions that:

- All eligible workers are automatically enrolled and 15% opt-out.
- Of newly enrolled workers:
  - 63% are enrolled into a master trust scheme.
  - 37% are enrolled into another, non-master trust, automatic enrolment DC scheme (in reality some of these schemes will be existing pension provision).[58]
- No non-eligible workers or self-employed people are assumed to opt-in.
- Of employees already saving in an existing DC schemes:
  - 80% remain saving in their current scheme.
  - 20% are moved into another automatic enrolment DC scheme or a master trust.
  - DB schemes close at a constant rate, resulting in 80% of private sector DB scheme members' schemes closing to new members and new accruals between 2010 and 2030.
  - The proportion of workers who would have joined the closed DB schemes join private sector DC workplace schemes.
  - Where a member changes jobs and enters a workplace with an existing DC scheme, 80% are assumed to join the new automatic enrolment scheme and 20% are assumed to join the existing DC scheme.

The displacement of members, leaving one type of scheme and entering another (as a result of movements in and out of the labour market or between jobs) results in roughly the same proportions of the workforce in different types of schemes. New members of DC scheme, who may be leaving DB schemes or be newly automatically enrolled, who are split between automatic enrolment and existing workplace DC schemes in the proportions outlined above.

[58] Based on information about scheme allocation from The Pensions Regulator – does not account for opt-ins or ineligible workers who are automatically enrolled

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

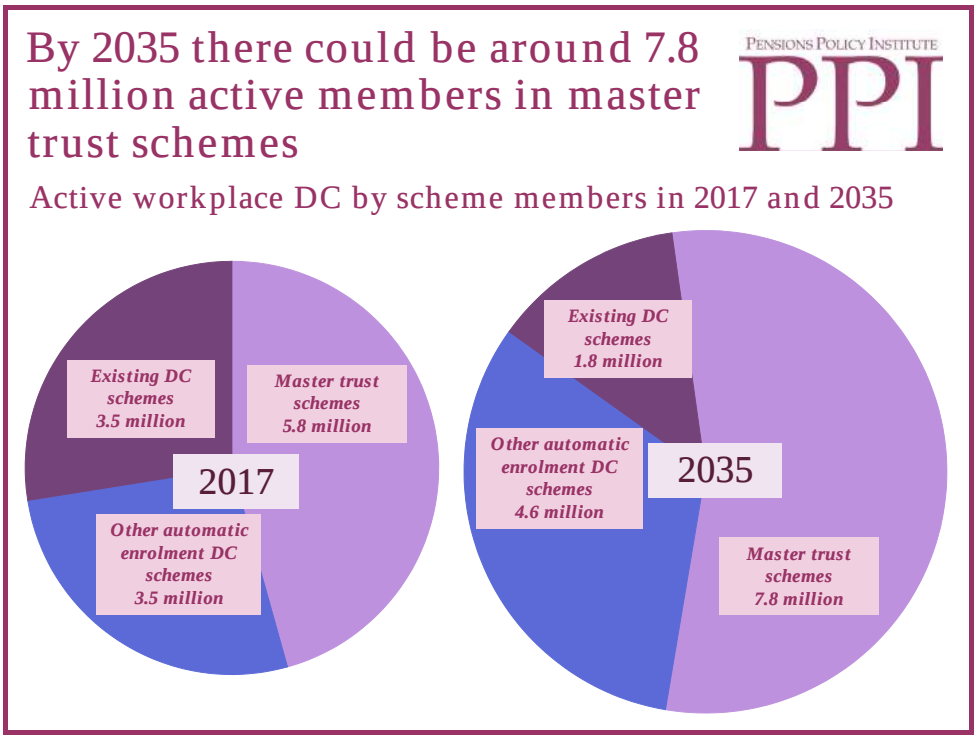
In 2017, there are around 12.8 million active members in DC workplace pension schemes. Around 5.8 million of these are in master trusts, around 3.5 million are in DC schemes which existed prior to automatic enrolment, and around 3.5 million are in new automatic enrolment DC schemes (not master trusts).

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 DC schemes (Chart 20).

The number of active savers in private sector DB schemes could shrink from 1.4 million in 2017 to under 0.5 million in 2035.[59]

Chart 20[60]




[59] PPI Aggregate Model
[60] PPI Aggregate Model

## How might DC assets evolve for individuals?

The 2017 median DC pot value for those aged 16 and over in Great Britain is around £15,000.[61] Automatic enrolment and the shift from DB to DC has resulted in more people saving in DC pension schemes and accruing initially small pots during the first few years of saving, bringing the median down to £14,000 in 2016. Over time, as pots have a chance to benefit from longer periods of investment and contributions, median pot sizes will grow.

### Box 11: assumptions

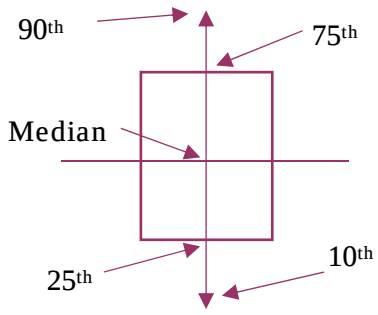
The following analysis is based on the assumptions that:

- Those currently saving in a workplace DC pension (trust or contract based) continue saving at their current level and continue contributing, with their employer, in the same proportions.
- Those who are not currently saving, but are eligible, are automatically enrolled and do not opt-out.
- Automatic enrolment minimum contributions rise in line with the phasing of contributions as set out in automatic enrolment legislation.
- Before charges, funds yield a nominal average 6% investment return (annually).[62]
- Earnings increase by 4.3% per year (on average).[63]
- Annual Management Charges (AMCs) range between 0.5% and 0.75% depending on scheme type.[64]

Economic assumptions are based on long-term OBR projections.

### Box plots

The next chart is a box plot. 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 represents the median.

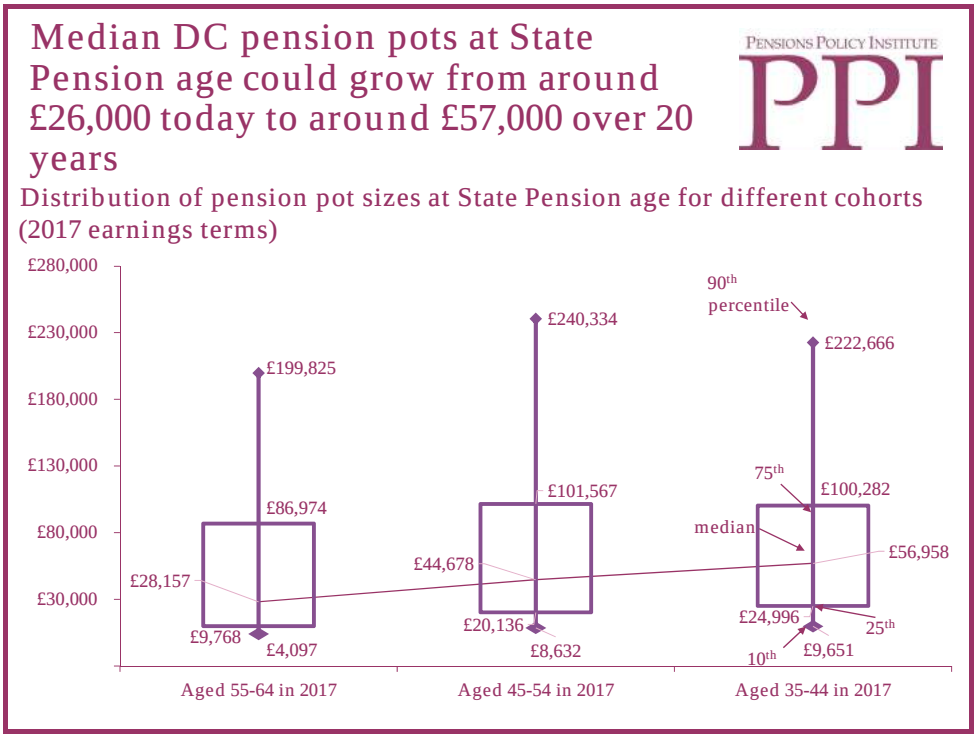



[61] PPI Aggregate Model and Wealth and Assets Survey
[62] A blend of Office for Budget Responsibility (OBR) returns based on an asset mix to represent typical pension portfolios. The long-term economic assumptions are based on the OBR Fiscal Sustainability Report (January 2017)
[63] Based on long-term OBR projections from Fiscal Sustainability Report
[64] See the appendix for further detail on assumptions

## Median DC pension pots could grow from around £28,000 to around £57,000 over 20 years

Assuming that those currently contributing to a pension fund with their employer continue to do so, the median DC pension pot size at State Pension age (SPa) could grow, in 2017 earnings terms, from around £28,000, (for those aged 55 to 64 in 2017) to around £57,000 (for those aged 35 to 44 in 2017). This represents an increase of around 100% over 20 years (Chart 21).

Chart 21[65]




£57,000 could yield an annual income of around £3,000 from an annuity (around £250 per month).[66] On top of a full individual State Pension income of around £160 per week, this would yield a retirement income of £890 per month i.e. £10,680 per year. This income might not be sufficient to replicate the same standard of living in retirement that people had in working life if they earned over £15,000 per year.

## How might the aggregate value of private sector DC assets grow in the future?

The following section explores how the aggregate value of DC assets might grow based on certain assumptions about employee and employer behaviour and under a range of potential future economic performance scenarios.

[65] PPI Aggregate Model
[66] 65 year old man, level single-life annuity, Money Advice Service comparison toll

### Box 12: assumptions

The following analysis is based on the assumptions that:

- All eligible employees are automatically enrolled and existing savers remain saving.
- 15% of automatically enrolled savers opt out (baseline scenario, DWP opt-out assumption by the end of 2018).
- Employee/employer contributions vary by scheme type: (baseline scenario).
  - Those in master trust and other automatic enrolment DC schemes make contributions with their employers on band earnings
  - Existing savers continue contributing at the same rates, on total earnings (if applicable).
- Investment scenarios are a product of the PPI's economic scenario generator (which uses data from Bloomberg). Long-term median rates are taken from OBR fiscal sustainability report.
- Median investment return is dependent on pension scheme and varies between 5.5% and 6%.[67]
- AMCs vary by scheme.

Economic assumptions are based on long-term OBR projections.

### By 2035, aggregate assets in DC schemes could grow to around £682 billion

Assuming that current trends continue, the aggregate value of private sector workplace DC assets could grow from around £373 billion in 2017 to around £682 billion in 2035. However, the aggregate value of assets will be sensitive to economic performance. Using Bloomberg data, the PPI has created an economic scenario generator, which allows exploration of DC asset performance under a potential range of economic scenarios.[68] If the market performs very poorly, DC assets could stagnate, reaching around £414 billion by 2035. In a very positive market performance scenario, DC assets could grow to around £1,148 billion by 2035 (Chart 22).

### Box 13: percentiles

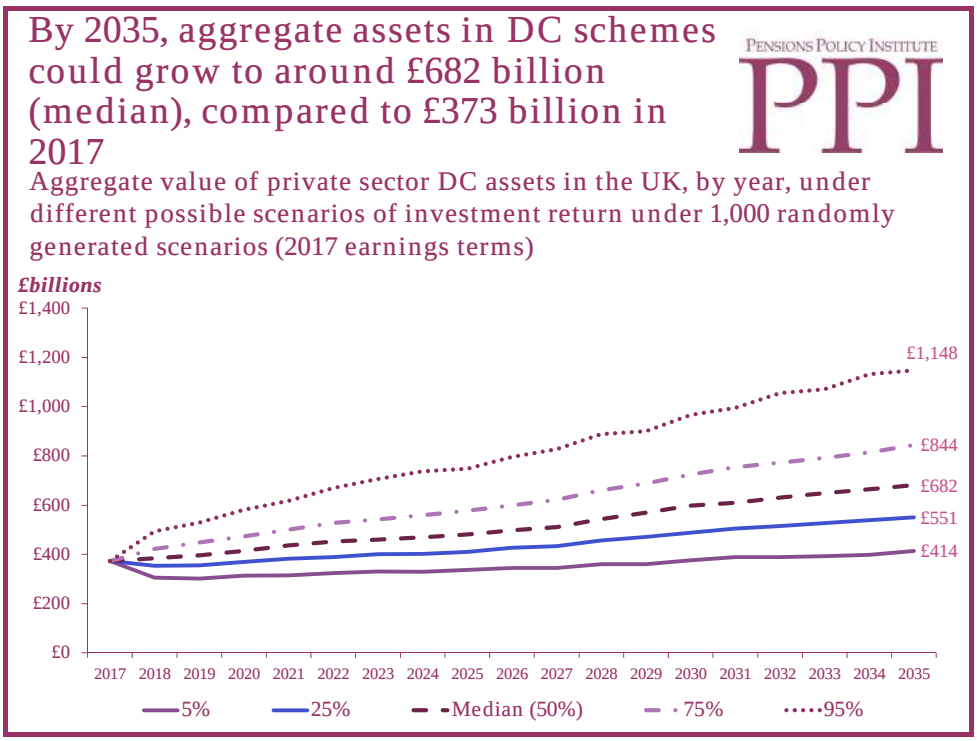
The following charts illustrate how a range of economic scenarios could affect the value of DC assets. The values are shown in terms of the likelihood that they will occur:

- 5% represents a 5% probability of very poor performance.
- 95% represents a 5% possibility of very good performance.
- The 25% and 75% points represent a 25% probability of relatively poor or relatively good performance respectively.
- 50% (median) is the central outcome, based on past performance.

[67] A blend of Office for Budget Responsibility (OBR) returns based on an asset mix to represent typical pension portfolios. The long-term economic assumptions are based on the OBR Fiscal Sustainability Report (January 2017)

[68] PPI Aggregate Model

Chart 22[69]




## Employee and employer behaviour, and government policy, will all affect the aggregate value of DC pension funds in the future

The aggregate value of private sector workplace DC schemes will vary not just as a result of economic fluctuations, but also as a result of employee and employer behaviour and government policy. There are an unlimited variety of possible ways that these agents could behave in future, and each would have a different effect on the aggregate value of DC assets.

[69] PPI Aggregate Model: refer to modelling annex for more details on the methodology

# Chapter four: How does fund design affect outcomes from DC saving?

This chapter considers which default fund investment strategies might be the most appropriate for people of varying income and attitudinal characteristics.

## All investment strategies involve a trade-off between risk and return

The ultimate value of investments (after accounting for contributions and charges) depends on the level of gains minus the losses incurred. Most assets which offer the opportunity for gains are also exposed to the risk of losses. This is because gains and losses both arise from:

- Economics (inflation, interest rates, etc.),
- Policy (government policy on tax or contribution levels),
- Consumer behaviour (contribution levels, saving persistence),
- The perceived value of shares, and
- Domestic and international market forces (such as the introduction of new product lines or the failure of a company).

## Charges, investment returns and volatility affect savings outcomes

Pension saving outcomes depend on a myriad of factors including:

- Member and employer behaviour (contributions, scheme choice),
- Scheme behaviour (charges, investment strategies),
- Government policy, regulation, and economic fluctuations.

Alongside contributions and external factors, there are three main metrics which affect the level of pot size that people achieve from DC pension savings:

- Charges: charges arise from administration, investment management and market costs (for example, transaction costs). Charges reduce the overall fund level, for example, an annual charge of 1.5% applied during a full working life could reduce an individual's private pension income by around 13% more than a charge of around 0.5%.[70]
- Returns: investment returns comprise the gain or loss generated on an investment compared to the amount originally invested. Gains increase fund value and retrospectively justify investments, while investment managers attempt to limit losses through strategic asset allocation.
- Volatility: volatility describes the range of gains and losses that a particular fund is likely to experience. A fund which has potential to experiences high losses and gains has high volatility and a fund with potential for low losses and gains has low volatility. A certain level of volatility is generally a price one has to pay if a fund is to accrue more than minimal returns. However a high level of volatility exposes funds to the risk of high losses. Pension scheme members with low risk appetites generally respond more favourably to funds with low volatility while those with high risk appetites value the

[70] PPI (2012a)

chance of accruing gains more highly than the avoidance of risk and more tolerant of higher volatility.

Most pension funds are, in theory, designed in a way which manipulates the combined impact of these three forces in order to generate the best outcome for the saver.

### Traditionally, many fund investments use bonds and cash to minimise the losses arising from equities

One of the most volatile assets are public equities, which are publicly listed shares in companies. Equity shareholders are entitled to profits arising from company business, after all creditors have been paid what they are owed. Shareholders are not held responsible for debts if companies become insolvent because of the "limited liability" under which the vast majority of companies operate.

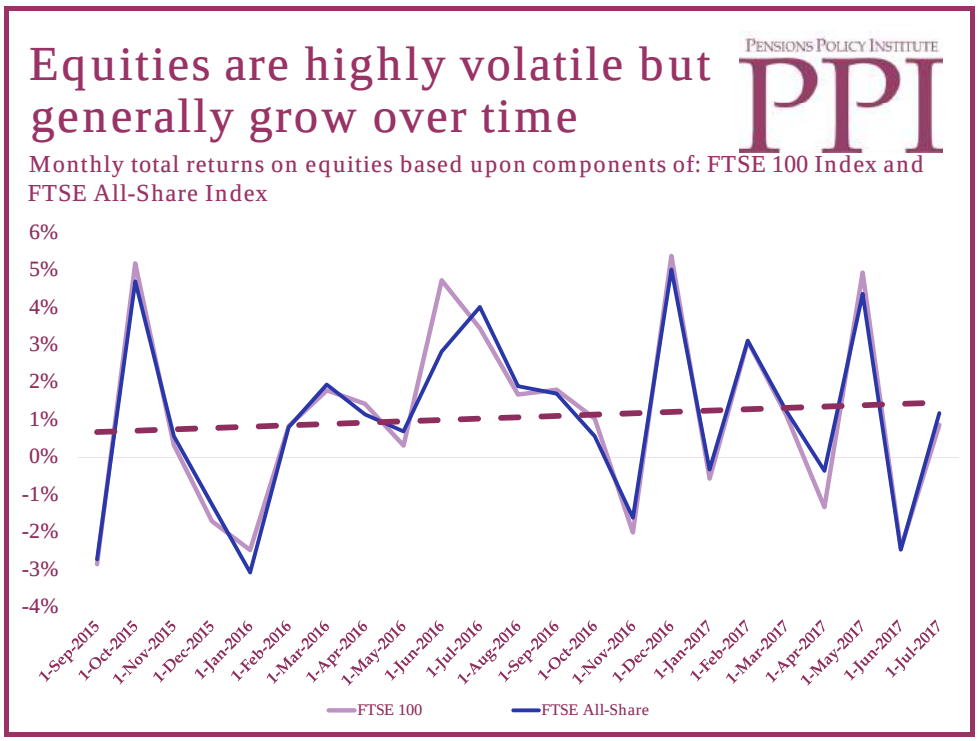
Over time, equities generally deliver higher overall gains than losses because most companies are linked to parts of the economy which experience growth and development and increase in value on average. Losses arise when companies don't perform as well as expected. Market changes which lead to losses cannot always be predicted and may arise from economic / political events or international forces such as changes in the value of currency.

Therefore, while equities are theoretically a good way to maximise gains, some funds may experience higher losses than gains. If these losses are sustained for a long time or if they occur near the time when the individual investor wishes to access their funds, then this can result in lower than expected fund sizes and cause financial problems for those who made retirement plans on the expectation of a higher fund value.

For the majority of investors, equity gains outweigh equity losses over time (Chart 23). At the moment the long-term projected return from equities is around 7%.[71]

[71] PPI long-term economic assumptions are based on the OBR Fiscal Sustainability Report (January 2017)

Chart 23[72]




There are ways of minimising losses within equity investments such as employing diversification: investing within different types of equity markets or in other types of asset classes alongside equities. Traditionally most funds are protected from experiencing too great a loss through investment in bonds and cash. Bonds are lending contracts or "debt instruments". Funds are invested in an organisation in return for a contract promising repayment of the capital plus interest at a certain time.

Bonds are most commonly issued by governments. Bonds give investors access to secure investments with guaranteed gains and allow governments to borrow money to pay off deficits and invest in infrastructure. In theory, government bonds are extremely safe investments, though a political crisis or government collapse could result in the loss of the original investment.

If an individual investor has some funds invested in equities and some in bonds, their funds are exposed to the opportunity of gains with a proportion ideally protected from losses in case of poor equity performance. Investment managers manipulate the proportion of equities to bonds in response to the risk appetite of the investor, the long-term intention for the funds (e.g., to be accessed at a certain date) and other aims of individual investors.

[72] FTSE Russel Factsheet: FTSE 100 Index, 31 July 2017

### Diversification into other asset classes can help reduce the risk of losses from market shocks

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 crashes. 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.[73]

Diversification into other asset classes is one way of protecting against the risk of shocks which might deplete the fund too significantly. This type of protection is especially useful for pension fund investments which represent a significant source of income for people in retirement. A loss arising from a stock market crash could severely affect an individual's retirement income if it occurs near a time when people need to access their funds and do not have time to attempt to recover the loss.

A stock market crash isn't an issue if members are well-diversified. Or indeed wholly invested in cash.

Most diversified funds include some bond and equity assets while investing a portion of the fund into other asset classes. The three main alternative asset classes used for diversification are real estate, commodities and infrastructure:

- Real estate: real estate consists mainly of investing in the development of commercial property, institutional properties and residential rental properties.[74]
- Commodities: commodities are land-based goods such as oil and gas.
- Infrastructure: structures and organisations which are essential to the efficient operation of society and the economy including: transportation structures such as roads and tunnels, utility and energy provision, and communication structures such as telephone fibre networks.[75]

These types of assets typically grow more slowly in the short-term than equities as they are linked to the construction and development of longer-term projects but are more secure than company shares which are sensitive to day-to-day market fluctuations. Over the long-term, these three asset classes tend to deliver a higher level of gain than bonds, but are less vulnerable to losses than equities.[76]

Asset classes are sensitive to different types of market changes, so a change in interest rates might affect returns from equities or bonds without affecting returns from other asset classes. However, the above assets tend to offer lower liquidity in terms of buying and selling, because they represent longer-term investments (though commodities provide higher liquidity than real estate or

[73] UBS (2016)
[74] UBS (2016)
[75] UBS (2016)
[76] UBS (2016)

infrastructure). They may also cost more to manage than bond/equity portfolios, because they involve more strategic investment and monitoring and the cost of buying and selling is more expensive.

### Default funds are generally de-risked approaching retirement using a combination of equities and bonds

The majority of pension savers, 99.7% in master trusts and 94% in Group Personal Pensions, have their contributions invested in the default fund.[77] Default funds are generally designed to maximise gains during working-life and migrate funds into more secure asset classes as people approach retirement in order to preserve the capital. This is known as "lifestyling".[78]

On average, lifestyled funds have around 70% to 80% of capital invested in equities twenty years prior to retirement, around 55% to 70% ten years prior and around 15% to 25% at the time people come to access their funds.[79]

Some default funds invest in lower volatility assets for the first few years of accumulation. This is so that people with low risk appetites, particularly those who have been automatically enrolled and do not have any previous experience with pension saving, will not be alarmed by losses and choose to withdraw from pension saving.[80]

### People have the option to invest in funds with higher or lower risk levels

Pension schemes offer members the opportunity to invest in a variety of funds instead of the default fund. Some are invested in line with ethical or religious considerations,[81] others focus on maximising gains or minimising losses.

### Automatic enrolment has increased the number and changed the profile of DC savers

Automatic enrolment has resulted in around 8.3 million new savers in workplace pensions, the majority of these into DC pension schemes.[82] People in the target group for automatic enrolment tend to have lower incomes, lower appetites for risk, and will be more dependent on income from state and private pensions in retirement.[83] Automatically enrolled savers tend to struggle more with making investment decisions and are more likely to be in their pension scheme's default fund. Many pre-automatic enrolment savers also find investment decisions difficult and many are in their scheme's default fund.[84] Therefore, default fund designs are very important as they will be partly responsible for determining the pension saving outcomes for millions of people.

[77] PPI DC Assets Survey 2017
[78] PPI DC Assets Survey 2017
[79] PPI DC Assets Survey 2017
[80] NEST (2016)
[81] For example, ethical funds, Sharia funds
[82] TPR (2017c)
[83] PPI (2014)
[84] PPI (2014)

### This section considers the potential outcomes for several different default fund structures

The rest of this chapter projects outcomes from five different default fund strategies and considers which might be the most appropriate for people depending on their income and attitudinal characteristics.

This chapter explores funds designed to manage gains, losses and volatility in line with different priorities:

- Low volatility – low volatility (also known as low risk funds) are designed for those with very low risk appetites or who wish to conserve their capital because, for example, they are close to retirement and / or very dependent on the income from their DC savings. In the following scenarios, a low risk fund is modelled as comprising:
  - 70% bonds
  - 20% equities
  - 10% cash
  - 0.5% total annual charges

- High risk – high risk funds are designed to maximise the opportunity for gains. They are more suitable for those with high risk-attitudes who are able to risk losing some of their capital in return for the opportunity of achieving high gains. In the following scenarios a high risk fund is modelled as comprising:
  - 100% equities
  - 0.5% total annual charges

- Lifestyle funds – lifestyle funds alter the balance of risk vs. reward throughout the lifetime of the saver. In the earlier years of saving they generally resemble high risk funds. As people start to reach within 10 years of retirement, the fund's bond / equity split becomes more even and could be classed as "medium risk". As people get closer to their retirement date, these funds are more likely to resemble low risk funds, designed to preserve the capital so that people can buy a retirement-income product. Some lifestyle funds may not be appropriate for those who wish to continue investing their pension savings after their retirement date. Some lifestyle funds are low-risk for the first five years in order to avoid early losses encouraging people to cease contributing.[85]

  In the following scenarios a lifestyle fund is modelled as comprising:
  - 80% equities and 20% bonds until;
  - 10 years prior to retirement at which point there is a linear transition to:
  - 25% equities, 50% bonds and 25% cash at retirement date.
  - 0.5% total annual charges

[85] For more information on how the lifestyle fund is structured, please see the modelling appendix

- Diversified growth fund – diversified growth funds (DGFs) attempt to minimise volatility (and loss) whilst allowing for higher gains than traditional low risk funds through investment in bonds and equities as well as other asset classes such as real estate, infrastructure and commodities. Because DGFs experience lower levels of volatility, they will not, in principle, suffer as much loss from financial market crashes as funds exposed heavily to equities. DGF assets are generally actively managed so that poorly performing or highly volatile assets can be shifted in advance or when market changes occur. Over time, DGFs are expected to grow steadily and deliver a guaranteed level of return. However, actively managed funds tend to incur higher charges than passively managed default funds, which can incur some erosion of the fund.

Most future projections of fund performance are based on past performance of asset types. While there is sufficient historical data on cash, bonds and equities to project a range of future outcomes, data on the past performance of more diverse asset classes is limited. Most DGFs aim for a specified level of return and a specified range of volatility. Data on the past performance of DGFs show that they perform differently depending on which portion of the economic cycle is being observed; at some times they perform less well than their benchmark and at others they perform above the benchmark. DGFs are specifically designed as long-term investment funds and therefore a snapshot of performance is not necessarily indicative of future performance. As it is not possible to view the data for a full-term DGF, this report projects DGFs under three different assumptions:

- Low performing DGF: a low level of return based on data on DGFs which performed less well than the benchmark.
- Benchmark DGF: a level of volatility and return which aligns with targets for DGFs currently on the market.
- High performing DGF: a higher than expected level of return based on data on DGFs which performed above the benchmark.[86]
- It is assumed that all three DGF's have a total 0.7% annual charge.

### DGFs are around 15% less likely to experience a loss within the first five years than lifestyle funds and around 7% less likely than low volatility funds

People with low risk appetites and low incomes are more likely to be put off by losses incurred during the early stages of pension saving.[87] This is due to:

- A low level of understanding of the long-term trade-offs between risk and reward involved in pension saving among those with little saving experience.

[86] PiRho (2015): Diversified Growth Funds: do they meet expectations; Hymans Robertson LLP (2017): DGFs for DC Schemes; Cambridge Associates (2015): Navigating the Diversified Growth Fund Maze; UBS (2016): Pension Fund Indicators 2016; Allenbridge (2016): Diversified Growth Funds – doing a good job

[87] NEST (2016)

- Pension contributions representing a greater proportional loss of income to those on low incomes, making these members potentially more sensitive to any losses.

Automatic enrolment has brought in over eight million new savers with lower average risk appetites than pre-automatic enrolment savers. Default funds which experience low levels of loss during the early stages of accumulation will be less likely to prompt these members to cease contributing. There are several ways of attempting to ensure funds experience low losses during the early stages of accumulation including investing contributions in a:

- Low volatility fund,
- Fund which is initially low risk but shifts funds into higher risk assets after the first five years of accumulation,
- DGF which aims to limit losses while delivering a targeted rate of return.

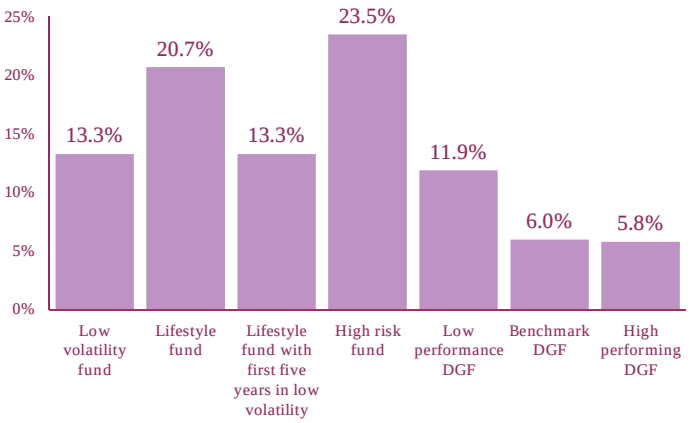
DGFs are the least likely to suffer a loss within the first five years, due to low levels of volatility. If DGFs meet their benchmark volatility objectives then they are 6% likely to incur a loss. If they perform more poorly than expected (and experience higher levels of volatility) they are around 11.9% likely to incur a loss.

Lifestyle funds, at 20.7%, are far more likely than other funds (except high risk funds) to incur a loss during the first five years. If they are invested using a low volatility strategy during the first five years then they are 13.3% likely to incur a loss (Chart 24). Low volatility funds are more likely to experience a loss than DGFs because their range of losses and returns is so small.

Chart 24[88]

## Diversified funds are least likely to experience a loss within the first five years

Chance of a loss in the first five years based on a median earning woman who starts saving at age 22 and saves consistently at 8% of band earnings until her State Pension age, by investment strategy


Most losses within the first five years will be relatively low at under 5% of the total value of contributions to date. The chance of incurring a loss of 5% within the first five years is:

- Low volatility fund: 2.9%
- Lifestyle fund: 12.1%
- Lifestyle / low volatility fund: 2.9%
- High risk fund: 15.7%
- Low performing DGF: 4.1%
- Benchmark DGF: 1.8%
- High performing DGF: 1.6%[89]

Avoiding losses and ensuring gains will be the best way to prevent a behavioural response which involves ceasing to contribute during the first five years.

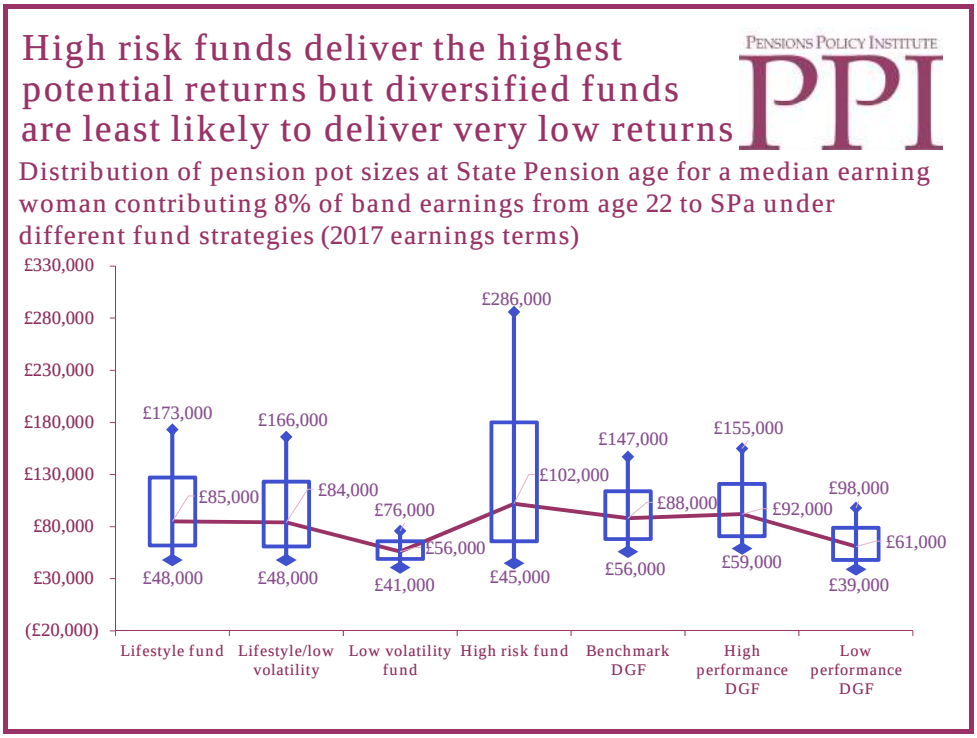
### High risk funds deliver the highest potential returns but well performing diversified funds are least likely to deliver very low returns

Whilst minimising losses is important for maintaining capital and preventing early opt-outs, over the long-term the level of gain becomes increasingly important, particularly in DC funds where the pot size directly affects the level of retirement income.

[88] PPI Individual Model and Economic Scenario Generator
[89] PPI Individual Model and Economic Scenario Generator

Different investment strategies are associated with different opportunities for gain (Chart 25).

Chart 25[90]




## High risk funds deliver the highest median returns, followed by DGFs

For a median earning woman contributing at 8% of band earnings from age 22 to SPa:

- High risk funds deliver the highest median returns resulting in a pot of around £102,000 at SPa.
- Diversified funds at high or benchmark performance deliver the next highest median returns for pots of £92,000 and £88,000 respectively.
- Lifestyle funds deliver the next highest median returns, resulting in pots of around £85,000, or £84,000 for a lifestyle fund with a low volatility start.
- A poorly performing DGF might deliver lower returns, resulting in a median pot size of £61,000 at SPa.

## High risk funds and lifestyle funds have the highest return potential above the median

While high risk and diversified funds deliver the highest median level of returns, high risk and lifestyle funds have a higher potential for return above the median:

- The 90th percentile of return for a high risk fund delivers a pot of around £286,000 at SPa.

[90] PPI Individual Model and Economic Scenario Generator

- The 90th percentile for a lifestyle fund or a lifestyle/low volatility fund delivers pots of around £173,000 or £166,000.
- Because diversified funds experience less volatility, they have lower opportunity for returns and depending on performance range between delivering pots of £98,000 and £155,000.
- The low volatility fund experiences the least opportunity for returns, with the 90th percentile of returns delivering a pot at SPa of around £76,000.

### Well performing diversified funds are least likely to deliver very low returns

Returns below median levels illustrate the potential for low levels of returns associated with investment strategies:

- High or benchmark performing DGFs are the least likely to experience very low levels of return. At the 10th percentile of returns they would respectively deliver pots of around £59,000 or £56,000 at SPa.
- Lifestyle funds deliver the next highest pot sizes at the 10th percentile of returns, at around £48,000, followed by high risk and then low volatility funds, at around £45,000 and £41,000.
- A poorly performing diversified fund could result in lower returns than all of the above, at the 10th percentile, delivering a pot size at SPa of around £39,000.

### The appropriate investment strategy for a default fund depends partially on the characteristics of the member

This chapter has discussed the trade-offs between risk and return in investment strategies, the potential outcomes from using different asset types and how people with different risk appetites and income levels might respond to losses or gains. In order to help bring about the most appropriate outcomes for pension savers, default fund design should take account of all of these variables (alongside many others not discussed here).[91]

Different types of schemes have members with different characteristics. Those in master trust schemes are more likely to have low incomes and risk appetites while those in group personal pensions are more likely to exhibit a range of incomes and risk appetites. Therefore, the most appropriate default fund design in any given scheme will vary, though there are variations between members within schemes. Those with lower incomes and risk appetites benefit from investment strategies with relatively low levels of volatility and loss while also providing a more predictable level of return:

- A diversified fund might be most appropriate fund for these members due to low levels of volatility, though a poorly performing diversified fund will deliver far lower returns than a lifestyle fund.
- Diversified funds provide less opportunity for high returns than lifestyle funds (which often provide some volatility protection as well). Therefore, while diversified funds are less likely to promote opting out as a result of

[91] For example: charges, governance, communications and scheme choice

early losses, they will not necessarily provide people with the best chance of a higher income in retirement.

- Lifestyle funds (with or without early volatility protection) might be most appropriate for those with low to average incomes and medium to high risk appetites as they contain volatility protection but also provide more opportunity for high returns.
- Diversified funds provide a level of certainty and are least likely to incur very low returns. Median returns from a benchmark DGF are similar to those from a lifestyle fund.

Those with higher incomes and high risk appetites might prioritise returns over protection from loss:

- A high risk fund, invested mostly or all in equities might be the most appropriate fund for these members as it provides the highest opportunities for return. However, high risk funds are also the most likely to incur a loss within the first five years and run the risk of very low returns. High levels of uncertainty are the price one must pay for the opportunity of accruing high gains.

In the case of a financial market crash, diversified funds might provide the best protection from severe losses due to the reliance on a wider number of asset classes. Under a market crash scenario, diversified funds might be the most appropriate fund for those of all income levels and risk appetites, unless they have time and opportunity to recover any losses through further investment.

### The most appropriate fund type will differ between people based on their intentions for accessing savings in retirement

Those who wish to convert their savings into a relatively certain level of income at retirement may benefit most from funds which de-risk as people approach retirement, such as lifestyle funds. On the other hand, those who wish to continue investing their pension savings after retirement (in their scheme or an alternative product) may benefit from a fund still exposed to higher potential for gain. This poses a difficulty for default fund designs which serve people who will access retirement savings in a variety of ways. Diversified funds are a potential solution as they offer opportunity for gains while protecting from volatility, but they limit the opportunity for very high returns and may therefore not suit those who prioritise the opportunity for high gains.

# Chapter five: Reflections on policy

Chapter five contains reflections on the policy themes highlighted by the report from leading thinkers and commentators in the pensions world.

Writers include:

- Toby Nangle
- Malcolm McLean
- Paul Todd
- Chris Curry

Toby Nangle
Head of Multi-Asset, EMEA at
Columbia Threadneedle Investments

## The role of Diversified Growth Funds in DC Pensions: turn off the autopilot as the weather worsens

There are myriad issues facing pension savers and schemes, as highlighted in this year's edition of ***The Future Book: unravelling workplace pensions***. One of the issues becoming increasingly apparent is that many DC pension savers are not investing their pension in a way that makes the most of their assets or provides adequate protection against market downturns. The overwhelming majority of people invest in their scheme's default fund which usually employs a lifestyle strategy. These strategies have fared well in an environment that over the last two decades has experienced strong, multi-year returns from both equities and bonds.

Going forward, however, pension savers and scheme trustees cannot rely on the underlying conditions that facilitated these returns to hold. In fact, I would describe this period as something of an historical freak. As we enter an investment climate in which an impactful market drawdown is not unthinkable, the key consideration for pension investors and trustees is which investment strategy best protects their assets while, in this context, providing the best possible financial outcomes in retirement.

## Long-run equity returns, while hard to beat, are volatile

Equities have shown over long periods of time to offer high total real returns. Consequently, investors seeking to achieve decent returns and have a ***high*** tolerance for volatility have found this mix in pure equity portfolios. And so they should, given their inherent characteristics.

First, equity is the most junior and riskiest part of a firm's capital structure and as such can have high levels of uncertainty attached to its worth. This uncertainty tends to manifest itself in high degrees of price volatility over a market cycle, and also periodic large drawdowns. Furthermore, these drawdowns have also been well-correlated to individuals' and companies' economic lives and so are

poorly suited to being vehicles for precautionary or rainy day savings. Second, equity holdings can take a long time to recover from drawdowns, and prospective retirees may find their time-horizons incompatible with the sort of holding periods that have historically been associated with markets recouping losses. In 1929, the US stock market did not recover until 1948 in nominal terms. The total return of the Finnish stock market is negative after 17 years and the Japanese market has yet to recover 27 years on. Furthermore, in instances of profound political change or revolution, hopes of recovery have been ultimately unfounded.

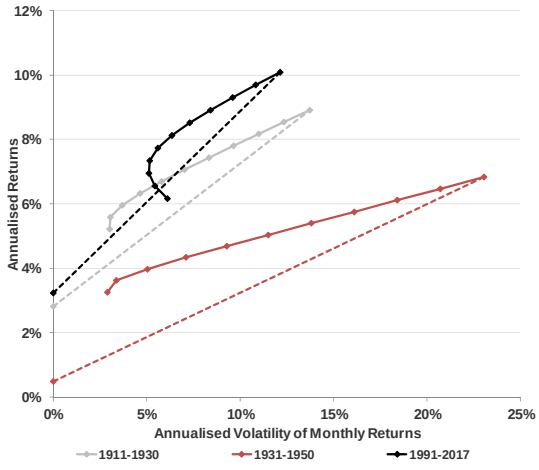
Not every pension saver is willing to endure such equity price volatility, or has an investment horizon long enough to withstand such periods of drawdown that may compromise a sustainable income withdrawal rate in retirement. And not everyone has sufficient conviction that equities will continue to deliver the returns they have done in the past.

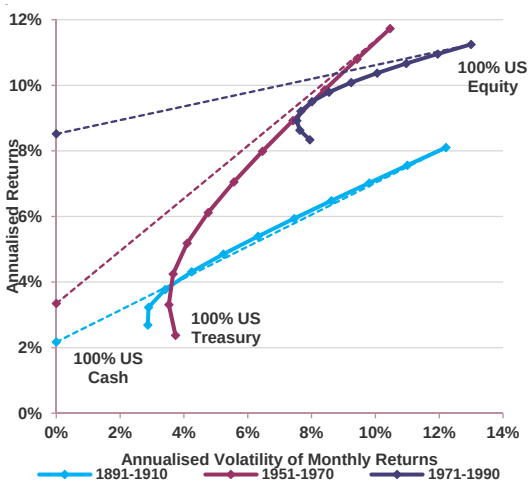
A well-managed, diversified and dynamically managed Diversified Growth Fund (DGF) may well be a better alternative for pension savers. There are manifold approaches to managing DGFs, but their mission, simply put, it is to deliver a combination of decent returns and low levels of return volatility. Decent returns might be expressed as an 'inflation plus 4%' or a 'cash plus X%' target, where these targets are typically comparable to the long-run equity real return. Despite this, Lifestyle strategies have been the most popular default fund choice for master trusts and pension trustees.

## Success in static asset allocation requires three conditions, but how likely are they to continue?

Firstly it must be said that Lifestyle funds have been able to deliver decent returns with low levels of volatility by combining static mixes of bonds and equities with great success. That said, for such a static asset allocation approach to flourish in the future, a few conditions need to hold. First, equity returns need to be positive. Second, other returns need to beat cash. Lastly, other returns need to diversify equity returns. These three conditions have in most part held in recent years. And so the risk-adjusted returns delivered by DGFs, while being strong in many cases, have not stood out strongly as superior to lifestyle investment approaches. DGFs, in essence, have been attempting to solve a problem that did not – in retrospect – exist. When examining recent historical data (Figure 1) it is clear that static asset allocation has been most favourable in the period 1991-2017, but this looks to be something of a historical freak.

***Figure 1: First graph - Mixtures of equities and bonds beat mixtures of equities and cash. Second graph - Mixtures of equities and cash beat mixtures of equities and bonds***

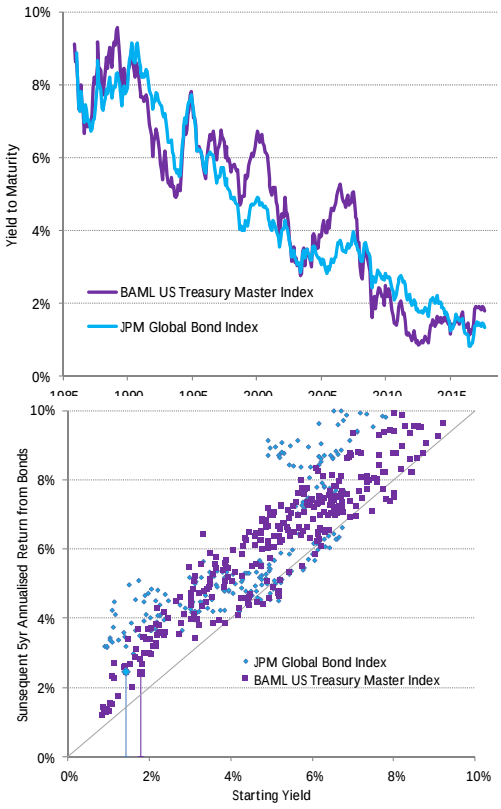





***Source: Columbia Threadneedle Investments, as at April 2017***

The dilemma facing pension schemes is how best to position themselves to protect capital in real terms and limit exposure to drawdowns – and the efficient frontier only goes so far as an accurate forecasting model. The mean variance analysis framework is itself over 60 years old and somewhat two-dimensional. Hindsight is a wonderful thing, but foresight is even better. On a forward-looking basis, schemes should perhaps be less concerned with short-term volatility and more concerned about left tail risk and drawdowns.

***Figure 2: First graph - Yield to Maturity on BAML US Treasury Master Index and JP Morgan Global Bond Index 1985-2017. Second graph - Five year rolling return on BAML US Treasury Master Index and JP Morgan Global Bond Index versus starting yield to maturity***




***Source: Columbia Threadneedle Investments, as at April 2017.***

The reason why static asset allocation has worked so well in the past appears to be found in the level and pattern of bond market returns. Bond returns are, over the medium-term, a function of starting yield and yield changes. As bond yields fall, so prices rise. Figure 3 (left hand graph ) shows the starting bond yield since 1985 to date, which has been on a downward trajectory over the past 30+ years. Indeed, Figure 3 (right hand graph) shows the relationship, since 1985, of five-year holding period returns that followed a given starting bond yield. Dots above the 45 degree line represent holding-periods that experienced falling yields (and rising prices); dots below the line represent rising yield (falling prices) holding periods.

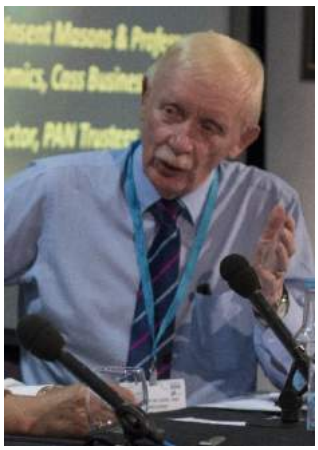
With 10-year gilts today carrying a starting yield of c.1.0%, very large yield falls are required from hereon for bonds to generate strong positive returns. Moreover, bond yields have fallen quickly during periods of equity market weakness and economic malaise, but have not risen during periods of economic strength. Consequently, bonds have provided a 'crash protection' to equity holdings in static portfolios, reducing overall portfolio volatility, while also contributing to strong positive returns.

### The journey from here on

Going forward, the bond market rally is unlikely to continue, given that it has largely been a result of globalisation and its effect on the global workforce, with emerging market (specifically Chinese) workers joining the world's labour ranks at the same time as labour power in the West diminished. This has dragged down interest rates, and with them bond yields, paving the way for looser monetary policy and quantitative easing. But as the world sits on the threshold of quantitative tightening, these conditions are unlikely to persist.

By taking an active approach to asset allocation, DGFs aim to deliver the strong risk-adjusted returns that static approaches have so successfully delivered of late, without relying on the continuation of the three above mentioned conditions to hold. Indeed, given the low level of starting bond yields for today's investor, it looks bold to rely on these three conditions continuing to hold from hereon.

In the current environment, DGFs can therefore be a fit-for-purpose default solution for DC pension schemes, with the ability to deliver strong returns over the pension savings period while adequately protecting investors against market downturns.



Malcolm McLean
Senior Consultant, Barnett Waddingham

### Default fund investment

The vast majority of DC pension scheme members invest their contributions in the default fund. Getting the default fund design right is therefore key, but also presents some challenges. How can you design a strategy that will deliver sufficient investment returns to meet members' retirement needs, when each member's needs will be different?

Well, you start with what is the same. And the main risks facing different members at the same stages of their savings journey are very similar.

### It's all about the risk

The biggest risk for younger members is that of not having enough in their pension pot when they reach retirement.

Many people will be familiar with the concept that taking too much investment risk might leave them falling short of their retirement target.

Fewer people will appreciate that taking too little investment risk might also leave them short - and with much greater certainty. Higher contributions is one answer, but is not a solution that is available or palatable to all.

Younger members therefore need to invest for growth (whether they like it or not). They also need to do it efficiently, as unnecessary charges at this stage can compound considerably.

The biggest risk for members nearing retirement is that a sudden change forces them to reassess retirement plans at short notice. This is where different member needs matter.

- A member wishing to take her pension pot as a series of lump sums, or through income drawdown is going to need to protect the value of her fund from sudden falls, but will also need it to keep pace with inflation. Above inflation growth would also be desirable, particularly as her pension pot is likely to be at its largest at this stage so even modest percentage returns can be meaningful.
- A member planning to purchase an annuity will need to be protected against sudden changes in the prices of annuities, so starting to invest to track annuity prices will be beneficial here.

### Simplicity versus sophistication

Armed with these commonalities we can start to design a default strategy that will be flexible enough to accommodate most members' needs.

At a high level, a range of lifestyling strategies with a common growth phase transitioning to different funds in the years before retirement to reflect different ways of drawing benefits will achieve this very simply. Further sophistication can then be added as appropriate for the individual scheme's governance budget.

For example, in the design of the growth phase, a basic strategy might rely heavily on passive global equities, but more sophistication can be added by introducing multi asset credit or illiquid exposure.

Additional sophistication and flexibility can also be added by allowing members to choose to allocate different portions of their fund to different retirement paths with different end points. For example, a member might decide they wish to allocate half their pot to fund a series of lump sums from age 65 and reserve the remainder to fund an annuity purchase at age 75.

In this way members can very easily and simply build highly tailored investment strategies without once having to express an opinion on what proportion of their fund they would like to allocate to Pacific rim equities - and importantly, do it within a realistic scheme governance budget.

### It's not all about investment

Finally, a good default strategy needs good support to get the most out of it. This includes decent contribution levels, a robust and flexible administration system and a well-thought-out member communication and support strategy.

DC pension schemes which can provide these things for their members may still not be able to guarantee a particular outcome, but they will have provided members with the best possible chance.

Paul Todd
Director of investment development and delivery, NEST Corporation

## Getting the default strategy right

Getting the default strategy right is the most important element of delivering better outcomes for our members. Over 99% of our 5 million members are in our default strategy at present. Whilst that number may come down a little over time, we expect the performance of the default fund to be the main investment experience for NEST members.

Prior to launching NEST undertook a lot of research into the characteristics, attitudes and aspirations of our expected membership. On the whole this was a group of people for whom DC investment strategies and not been designed for previously. We continue to update our member evidence base to ensure the default approach meets their developing needs.

Key elements of our strategy derived from member research, which were (and in some cases still are) novel is NEST's approach to managing risk throughout a members lifetime. Unlike other schemes we take a little less investment risk on behalf of members when they first start out on their savings career. Taking varying degrees of risk when pot sizes are small makes little to no difference to final pot sizes, but attitudinal research into our membership suggested it could make a significant difference to people's appetite to continue saving. This was particularly acute for younger savers who were extremely alarmed at the prospect of poor performance when saving for the first time.

Similarly a single default strategy wouldn't provide sufficient flexibility to adapt and evolve our approach as our membership grows or as the legislative landscape changes. This has proven particularly prescient in relation to the Freedom and choice reforms. Using target date funds as our default allows us a great deal of flexibility. For example we were able to react to the end of compulsory annuity purchase quickly at fund level, rather than having to disrupt tens of thousands of individual lifestyle paths. NEST has nearly 50 target date funds, which not only help with member communications and expectations (it's very clear when we expect members to retire and what we are doing to manage their journey) but also has significant benefits in terms of operational efficiency and reducing transaction and trading costs / drag on performance.

Another of our investment beliefs is about the importance of having an in-house investment team of professional investment practitioners. The in-house team make the key decisions and recommendations to the trustee about asset allocation, risk management and stewardship. There is general consensus that getting asset allocation decisions right is the key determinant of overall performance. Central to our approach for the default strategy is making sure we have access to the right asset class building blocks, at the right

price and have well developed relationships with the external managers who directly manage the underlying securities of our approach. We firmly believe that aligning interests across the investment chain, is a big part of providing a high quality investment strategy for our members, and due to the benefits of scale doing that at low cost. Our portfolios to date are made up of 15 different building block funds, including emerging market debt and climate aware equities, which we added this year.

Our overall objective when managing members' money in the default strategy is to look to maximise their investment return, without exposing them to unacceptable levels of risk or uncertainty. We aim to grow their pots significantly more than cost of living change. For example our investment objective in the 'growth phase' (where most members spend most time), is to out-perform inflation by 3% after charges. Managing risk to achieve this in different market and economic environments is a central tenet of our approach. We try and look at risk in an increasingly holistic way. For example alongside examining traditional risk factors such as inflation, credit or liquidity we are also looking at a broader set of risks around things like corporate governance, or how companies are managing the transition to a low carbon economy. We think the close monitoring of risk, throughout our members' savings career will play a significant part in reassuring savers of the benefits of long-term saving and investing and provide better long-term outcomes overall.

Chris Curry
Director, Pensions Policy Institute

Throughout 2017 the Department for Work and Pensions has been undertaking a Review of Automatic Enrolment, and I am lucky enough to be one of three co-chairs to the advisory group to the review (along with Jamie Jenkins and Ruston Smith). There is plenty of new evidence in this edition of the Future Book that is of relevance to the review.

There is some very good news. The number of individuals bought in to workplace pension saving continues to increase as automatic enrolment is being rolled out among smaller employers, and the evidence so far suggests that opt-out rates remain low. Many individuals who are not directly eligible to be automatically enrolled are now saving, some through opt-in and some through employers simply enrolling all of their staff.

We can also see the power of inertia, with the vast majority of scheme members remaining in default pension funds rather than making an active choice. This is not unexpected, but does place an important onus on to pension providers and employers, to make sure that the default funds are suitable for the employees who are placed into it. This version of the Future Book

highlights clearly how important the choice of default can be.

But this report also highlights a number of areas where there may be more to be done to improve the DC pensions landscape. There are still 6 million workers ineligible for automatic enrolment – not including the self-employed. Contributions are still relatively low – we would expect the median contribution to increase over time as the minimum automatic enrolment contribution level increases in 2018 and 2019, but the figures suggest that currently many individuals are only saving at the minimum contribution level. We know that, in the absence of other savings or assets, this is unlikely to be enough to deliver a good retirement.
So there is a challenge to both continue to increase the number of people saving, and the amount that either they or their employers save on their behalf.

We also have little information about the persistency of pension saving under automatic enrolment. This edition highlights that the proportion of the population eligible for automatic enrolment making a pension contribution in at least 3 of the last 4 years has not increased significantly since 2012 (at around 77%). While we know that opt-out rates are low, these figures only pick up those who act within one calendar month of being enrolled. We don't know how many stop contributions after the first month. Although we do know that there are many pension pots no longer receiving contributions, we can't tell if these are people who have left employment, no longer qualify for automatic enrolment or who have simply chosen to stop contributing.

There are also some questions that this edition of the Future Book can't answer, but which will be important in future editions – what will happen as the increased minimum contribution levels for automatic enrolment are phased-in in April 2018 and 2019? Will more individuals opt-out of pensions when they are automatically enrolled? Will those currently saving at low levels choose to stop making contributions to pensions if they have to pay more, and lose out on tax relief and the employer contribution?

The DC pensions landscape is constantly changing, which is why the Future Book is so important. Without information to help understand how and why the landscape is changing, it becomes much harder to set policy to improve retirement outcomes.

# Appendix: PPI modelling for The Future Book

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. The assumed median values for each of these values are listed below:

CPI: 2.0%
Earnings: 4.3%
Equity return: 7%
Bond Return: 4%
Risk-free Return: 2%

## 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).

## Asset allocation

Unless otherwise specified, asset distributions are assumed to be 56.7% invested in equities, 33.3% invested in bonds and 10% in cash such that the median return is 5.7%. These assumptions are consistent with those used across the PPI modelling suite and are the result of consultation with the PPI's modelling review board, which consists of a number of experts in the field of financial modelling.

Fund charges are assumed to be 0.75% for existing workplace DC schemes,[92] and 0.5% for Other DC / master trust schemes set up for automatic enrolment.[93]

[92] Average charges for trust-based schemes are 0.71% and for contract-based schemes 0.95%, DWP (2012b), and a 0.75% charge cap will be introduced for any DC default funds being used for automatic enrolment from April 2015 onwards.

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

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,[94] 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.

### The Economic Scenario Generator

The PPI's Economic Scenario Generator (ESG) is used to produce randomly generated future 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.

### *Summary of modelling approach*

The six identified risk factors modelled are:

G Nominal GDP
P CPI

[94] OBR (2017)

| | |
|---|---|
| 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 $\varepsilon_t$ are independent multivariate Gaussian random variables with zero mean. The matrix $A$ and the covariance matrix of the $\varepsilon_t$ 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.

## PPI Aggregate Model

### Overview of Aggregate Modelling of Private Pensions

The PPI Aggregate Model links changes in the UK population, the labour market and economic assumptions to project forward private (and state) pension savings. Population projections are taken from 2014-based figures published by the ONS.

Current distributions of individuals across pension scheme types are taken from the Lifetime Labour Market Database (LLMDB)[95] a panel dataset of 1% of UK National Insurance records. The workforce data includes numbers of individuals and average earnings split by age, gender and earnings band. The data are further split between public and private sector contracted-out schemes and those who are contracted-in to the State Second Pension (S2P).

### Initial Conditions

In the base year of projection (2010), individuals with private sector pension arrangements are split between public and private Defined Benefit (DB) schemes and workplace Defined Contribution (DC) schemes. 17.5% of working individuals are assumed to be members of DC workplace pensions and 32.1% of individuals are assumed to be members of DB workplace schemes.[96] 73.2% of those in DB schemes are assumed to work within the public sector,[97] leaving 8.6% of the workforce in private sector workplace DB schemes.

The workforce not initially enrolled in public sector DB, private sector DB or private sector workplace DC, are considered as the eligible population for automatic enrolment. This includes individuals not in workplace pension schemes who contribute to personal pensions.

Stocks of existing assets for DB schemes and workplace DC schemes are split across cohorts by contribution levels. Initial stocks of workplace DB assets were assumed to be £890 billion in the base year.[98] It was assumed that the stocks of DC assets in 2010 were £275 billion.[99]

### Movement of individuals between schemes due to decline in DB schemes

The proportion of individuals in each scheme is not stable over time: the proportion of the total workforce who are enrolled in a private sector DB scheme is assumed to decline by 80% between 2010 and 2030 and these individuals are moved into the existing DC workplace schemes.

[95] Data from LLMDB 2010-11

[96] ONS (2013a)

[97] Average proportion of males and females employed in public sector COSR schemes according to LLMDB 2010-11

[98] TPR (2012) The Purple Book Chapter 4 Table 4.1 Assets discounted to the base year.

[99] Workplace DC assets taken from ONS (2012) Table 3, adjusted for decumulated assets.

### Movement of individuals between schemes post automatic enrolment

From 2012, employees in the private sector without workplace DC provision are placed in a scheme to represent automatic enrolment, which is split further into master trust schemes and other DC schemes, assuming 63% are automatically enrolled into master trusts and the remaining into other DC schemes. Individuals are enrolled in proportion to the likely number of employees becoming eligible each year due to staging of their employers. Similarly, during the staging period, employees in existing DC schemes who become eligible for automatic enrolment either remain in the existing scheme or are moved to a new automatic enrolment workplace DC scheme (again split into master trusts and other DC schemes in the same proportions as mentioned above). It is assumed that 80% of existing members remain in their current scheme, and 20% are expected to move to the new automatic enrolment scheme. New members to DC schemes who have an employer with an existing scheme either join the new automatic enrolment scheme (80%) or join an existing DC scheme (20%).

Overall, after 2012 the private sector workforce is assumed to contribute to either private sector DB pension schemes, DC schemes which were existing prior to automatic enrolment, DC which were set up for automatic enrolment, or schemes set up for those that are eligible for automatic enrolment that did not contribute before the implementation of automatic enrolment. It is assumed that 14%[100] of the workforce change jobs from year to year, which causes individuals to shift from existing DC schemes into new DC automatic enrolment schemes over time.

### Contributions

Contributions are taken as a percentage of total earnings for employer provided schemes (both existing schemes and those set up after automatic enrolment) and are taken across band earnings for individuals automatically enrolled who previously were not saving. The earning band is taken to be £5,876 to £45,000 with an earnings trigger of £10,000 (all in 2017/18 terms).

When automatically enrolled, individuals and their employers are assumed to contribute at the minimum levels required under automatic enrolment legislation (phased in from a combined contribution of 2% of band earnings in 2012, rising to 8% of band earnings in 2018 in accordance with existing regulations) unless otherwise stated.

[100] Average annual workforce churn. DWP (2010) p49

### *PPI Modelled Projection of Wealth and Assets Survey Data*

The projection of pension wealth at retirement has been calculated by age cohorts based upon current pension wealth and level of saving.

#### Base data

These projections are based upon wave 3 data from the Wealth and Assets Survey (WAS).

The WAS is a longitudinal survey that interviewed across Great Britain; England, Wales and Scotland (excluding North of the Caledonian Canal and the Isles of Scilly). Wave three achieved approximately 21,000 household interviews in the period July 2010 to June 2012.

Personal data:

- Age band, used to assess cohort
- Sex, used to assess retirement age
- Income, used to assess automatic enrolment eligibility

Scheme data:

- Pension scheme wealth
- Scheme type
- Contribution style
- Contribution level for employee and employer

Individuals have been rolled forward to 2017, subject to earnings growth, pension wealth growth and automatic enrolment.

#### Model assumptions

Assumptions used are consistent with the aggregate model unless stated otherwise, economic modelling is deterministic using the central economic returns.

- Behaviours are unchanged over the accumulation period, contribution levels remain constant.
- To assess potential retirement outcomes it is assumed that an individual will not opt-out of automatic enrolment.
- Imputed values in WAS are assumed to be appropriate.
- All results are stated in 2017 earnings terms.

#### Projection of current pension wealth

Current pension wealth is expected to grow in line with the PPI's economic basis subject to fund management charges.

#### Projection of current pension contributions

The current level of regular employee and employer contributions to occupational DC schemes are projected assuming that the individual remains in work and is subject to earnings increases. Tax relief is applied to the contributions where appropriate based upon current rules.

### Projection of future automatic enrolment pension wealth

Individuals are assumed to commence automatic enrolment contributions subject to not already making regular contributions to a pension scheme and being in suitable employment and eligible for automatic enrolment.

## *Individual modelling funds*

### Pension funds

A number of pension fund portfolios have been modelled to reflect alternative investment strategies.

Charges have been modelled as a proportion of fund. Total charge, including investment charges and admin charges, to the individual:

- 0.5% where fund investment is in equity, bonds & cash only
- 0.7% where a more diversified fund is used

### Life styled fund

| Life styled fund | | | |
|---|---|---|---|
| | Low volatility start | Accumulation phase | Life styling phase |
| ***Duration*** | 5 years<br>***Not applied in the "Lifestyle default fund"*** | | Length: 10 years<br>· Based upon published investment strategies of Mastertrusts<br>· Similar weighting between equities and bonds at 10 & 20 years from retirement results in DC survey<br>· Linear transition to at retirement asset split |
| ***Asset Split*** | · 20% equity<br>· 70% bond<br>· 10% cash | · 80% equity<br>· 20% bond | · 25% equity<br>· 50% bond<br>· 25% cash |
| ***Source*** | This is based upon the results coming out of the DC survey (Low-risk fund) | This is based upon the results coming out of the DC survey (Master trust default strategy) | This is based upon the results coming out of the DC survey (Master trust default strategy)<br>· Using the "At retirement date" |

| | | | |
|---|---|---|---|
| | | · Using the "20 years prior to member retirement date"<br>· Excluding "other"<br>· The "10 years prior to member retirement date" show a similar weighting between equities and bonds | |

### Other equity bond portfolios

| Equity / Bond portfolios | | |
|---|---|---|
| | Low volatility fund | High risk fund |
| ***Asset Split*** | · 20% equity<br>· 70% bond<br>· 10% cash | · 100% equity |
| ***Source*** | This is based upon the results coming out of the DC survey (Low-risk fund) | This is based upon a simple equity investment strategy |

### Diversified funds

These funds are based upon a view taken from analysis of diversified growth fund performance and benchmarking.[101] The sensitivities have been made based upon a view of historical performance and reflect the returns observed over a partial economic cycle. This may not reflect long-term performance of the funds.

| Diversified funds | | |
|---|---|---|
| | Benchmark fund | Sensitivities |
| ***Volatility benchmark*** | 50% equity | |
| ***Investment return benchmark*** | 90% equity or Inflation + 4.3% | · Additional 0.2% long-term return<br>· 75% equity return |

[101] PiRho (2015): Diversified Growth Funds: do they meet expectations; Hymans Robertson LLP (2017): DGFs for DC Schemes; Cambridge Associates (2015): Navigating the Diversified Growth Fund Maze; UBS (2016): Pension Fund Indicators 2016; Allenbridge (2016): Diversified Growth Funds – doing a good job

### Underlying asset returns and inflation returns

Where volatility has been adjusted this is measured against the historical volatility of equity returns.

### Individuals

The individual is assumed to work continuously until retirement at the legislated State Pension Age (SPA). Their earnings are assumed to follow an age and gender based profile derived from the Labour Force Survey (LFS).

## *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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# References

Association of British Insurers (2017), ABI Press release, 11 April 2017 "The new retirement market: the evolution continues" ABI, London

Association of British Insurers (2016a), ABI Press release, 15 August 2016 "ABI pension freedom statistics - one year on factsheet" ABI, London

Association of British Insurers (2016b), ABI Press release, 28 March 2016 "ABI pension freedom statistics - one year on factsheet" ABI, London

Association of British Insurers (2015a), ABI Press release, 03 November 2015 "£4.7 billion paid out in first six months of pension freedoms" ABI, London

Association of British Insurers (2015b) ABI Press release, 15 July 2015 "Industry figures reveal more than £1.8 billion withdrawn in first two months as consumers exercise new pension freedoms" ABI, London

Blake, D. Harrison, D. (2014) ***Independent Review of Retirement Income Consultation Paper Pensions Institute*** Cass Business School

Department for Work and Pensions (DWP) (2017) ***Workplace Pension Participation and Savings Trends of Eligible Savers Official Statistics: 2006 to 2016*** DWP, London

Department for Work and Pensions (DWP) (2016a) ***State Pension age independent review: terms of reference*** DWP

Department for Work and Pensions (DWP) (2016b) ***Employers' Pension Provision Survey 2015*** DWP

Department for Work and Pensions (DWP) (2015a***), Review of the automatic enrolment earnings trigger and qualifying earnings band for 2016/17: supporting analysis*** DWP

Department for Work and Pensions (DWP) (2015b) ***Automatic Enrolment evaluation report 2015*** DWP, London

Department for Work and Pensions (DWP) (2014) ***Automatic enrolment opt-out rates: findings from qualitative research with employers staging in 2014*** DWP, London

Financial Conduct Authority (FCA) (2016), ***FCA survey of forms providing financial advice*** FCA

Financial Conduct Authority (FCA) (2015), ***FCA pension freedoms data collection exercise: analysis and findings*** FCA

Her Majesty's Treasury (HMT) Financial Conduct Authority (FCA) (2016) ***Financial Advice Market Review: Final report*** DP15/5 FCA

Institute for Fiscal Studies (IFS) (2016a) ***What happens when employers are obliged to nudge? Automatic enrolment and pension saving in the UK*** IFS Working Paper W16/19, IFS

Institute for Fiscal Studies (IFS) (2016b) Presentation from Launch event of research funded by the IFS Retirement Saving Consortium and the Economic and Social Research Council ***Automatic enrolment: the story so far*** IFS

National Employment Savings Trust (NEST) (2016) ***Advisers' guide to NEST***, NEST

OMB Research Ltd., The Pensions Regulator (TPR) (2017) ***Ongoing duties survey – July 2017*** OMB, TPR

Office for Budget Responsibility (OBR) (2017) ***Fiscal Sustainability Report 2017*** OBR

Office for National Statistics (ONS) (2015) ***Chapter 6: Private Pension Wealth, Wealth in Great Britain 2010-12*** ONS

Pension Protection Fund (PPF) The Pensions Regulator (TPR) (2016) ***The Purple Book. DB Pensions Universe Risk Profile 2014*** PPF

Pensions Policy Institute (PPI) (2016) ***Pension Primer*** PPI

Pensions Policy Institute (PPI) (2015) ***The Future Book: unravelling workplace pensions*** PPI

Pensions Policy Institute (PPI) (2014) ***How complex are the decisions that pension savers need to make at retirement?*** PPI

Pensions Policy Institute (PPI) (2013) ***What level of pension contribution is needed to obtain an adequate retirement income?*** PPI

Pensions Policy Institute (PPI) (2012) ***Closing the gap: the choices and factors that can affect private pension income in retirement*** PPI

Pensions Policy Institute (PPI) (2012a) ***The changing landscape of pension schemes in the private sector in the UK*** PPI

The Pensions Regulator (TPR) (2017a) ***Detailed guidance for employers. 2, Getting ready: First steps to prepare for the new employer duties*** TPR

The Pensions Regulator (2017b) ***Declaration of compliance report July 2012 – end July 2017*** TPR

The Pensions Regulator (2016b) ***Code of practice no.13: Governance and administration of occupational trust-based schemes providing money purchase benefits*** TPR

The Pensions Regulator (2017c) ***Automatic enrolment: Commentary and analysis: April 2016 – March 2017*** TPR

Willis Towers Watson (2017) ***DB member choice survey 2017: the rise of pension flexibility*** Willis Towers Watson

UBS Asset Management (2016) ***The right ingredients: Pension Fund Indicators 2016*** UBS

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