Pension Protection Fund

The Purple Book

DB PENSIONS UNIVERSE RISK PROFILE

December 2018

Contents

Overview
Key figures

Number of PPF eligible schemes
2006 7,800 → 2018 5,450

Number of active members
2006 3.6m → 2018 1.3m

Percentage of schemes closed to new benefit accrual
2006 12% → 2018 41%

Percentage of schemes open to new members
2006 43% → 2018 12%

Percentage of schemes closed to new members but open to new benefit accrual
2006 44% → 2018 46%

Percentage of scheme assets invested in bonds
2006 28% → 2018 59%

Percentage of scheme assets invested in equities
2006 61% → 2018 27%

Percentage of scheme assets invested in assets other than equities and bonds
2006 11% → 2018 14%

Funding level (s179 basis)
2006 97% → 2018 96%

Maximum and minimum funding levels (s179 basis)
2007 109% | 2009 80%

Funding level (buy-out basis)
2006 60% → 2018 73%

Average insolvency rate of PPF eligible schemes' sponsoring companies
2006 0.8% → 2018 0.4 %

Annual compensation paid by PPF
2006/07 £1m → 2017/18 £725m

PPF levy in year
2006/07 £271m → 2017/18 £541m

01 Executive summary

Summary

This is the 13th edition of the Pensions Universe Risk Profile (*The Purple Book*). *The Purple Book* provides the most comprehensive data on the UK universe of Defined Benefit (DB) pension schemes in the private sector. This year, *The Purple Book* dataset covers 5,450 schemes – 98.7 per cent of the estimated universe of schemes eligible for PPF compensation.

Scheme demographics

The proportion of schemes open to new members remained stable, compared to *The Purple Book 2017*, at 12 per cent. While the open share fell sharply from 2006 to 2010, the decline has stabilised since then. Schemes continue to move from being closed to new members to also closing to new benefit accrual, with a rise to 41 per cent from 39 per cent in 2017. Despite this, 1.3 million people continue to accrue new benefits in those schemes that are still open to it.

Larger schemes are more likely to be open to new members. 21 per cent of members were in open schemes with a further 53 per cent in schemes that are closed to new members but open to new benefit accrual.

The Purple Book 2018 dataset includes 10.4 million DB scheme members, down slightly from 10.5 million last year. Of these:

- 41 per cent are pensioner members
- 47 per cent are deferred members, and
- 12 per cent are active members.

The number of active members has been falling since the first edition of *The Purple Book* in 2006. There were 1.3 million active members in 2018 down from 3.6 million in 2006.

Scheme funding

Universe scheme funding improved in the year to 31 March 2018. The net funding position on an s179 basis improved to a deficit of £70.5 billion compared to a deficit of £161.8 billion the year before, while the aggregate funding level increased to 95.7 per cent from 90.5 per cent. Half of this increase is due to more up-to-date valuations and the shrinking dataset/universe, while the rest is due to market movements - higher gilt yields driving down liability values and a rise in equity markets helping to increase asset values.

On an estimated full buy-out basis, the net funding position improved to a deficit of £584.0 billion from a deficit of £736.2 billion the year before, with the funding level improving from 67.7 per cent to 72.9 per cent.

There has recently been a lot of market commentary on reductions in liabilities as a result of a slowdown in the rate at which life expectancy is improving. This isn't captured in this *Purple Book* but we should see the impact in the next edition and in the PPF 7800 Index when the new s179 basis comes into force in the December update of the index.

Asset allocation

Continuing the long-term trends, the aggregate proportion of schemes' assets invested in equities fell from 29.0 per cent to 27.0 per cent, while the proportion in bonds rose from 55.7 per cent to 59.0 per cent. While it appears that the proportion of assets held in instruments other than bonds and equities fell from 15.3 per cent to 14.0 per cent, this reflected a larger negative proportion held in cash (-2.5 per cent compared with -0.9 per cent), probably reflecting swap and gilt repurchase arrangements.

Within bonds, the proportions held changed as follows:

	Proportion of bonds held in *Purple Book* dataset		
Type of bond	**2018**	**2017**	**Commentary**
Government fixed interest	24.1%	24.1%	Stable since last year
Corporate fixed interest	28.8%	31.4%	The sixth successive annual decrease
Index-linked	47.1%	44.5%	The ninth successive annual increase

Within equities, the UK-quoted proportion fell from 20.5 per cent to 18.6 per cent, while the proportions of overseas-quoted and unquoted/private equities both increased.

PPF levy, claims, and compensation

- In 2017/18, the levy totaled £541 million, down slightly from the previous year.
- The top 100 levy payers accounted for 42 per cent of the total levy, similar to last year.
- Around 18 per cent of schemes had no risk-based levy while 2.6 per cent of schemes saw the cap of 0.75 per cent of smoothed liabilities apply to their risk-based levy.
- Over three quarters of the total levy came from schemes sponsored by employers categorised as 'Large/Complex' or 'Group £50m+' for Experian scorecard purposes.

In the year to 31 March 2018, 50 new schemes entered PPF assessment. This is similar to the number in each of the preceding three years and much lower than the levels seen before this. However, due to the large size of a few of these claims, the total value of them was, at

£1.7 billion (as measured on an s179 basis), the highest of any year (ending 31 March) in the PPF's history. As at 31 March 2018, seven schemes in assessment had liabilities (s179) of over £250m, compared with three as at 31 March 2017. Despite all of this, our funding level (as measured on the PPF's accounting basis, and including schemes in PPF assessment) rose from 121.6 percent as at 31 March 2017 to 122.8 per cent as at 31 March 2018.

In the year to 31 March 2018, the PPF made compensation payments of £725 million compared with £661 million in the previous year. As at 31 March 2018, 135,377 members were in receipt of compensation, up from 129,661 a year earlier. The average annual compensation in payment to pensioners and dependants was £4,380, slightly up from £4,309 as at 31 March 2017.

Risk reduction

DB pension schemes have continued to close to new benefit accrual. And in terms of asset-side risk reduction, they have also continued to move their investment allocation away from equities and towards bonds.

Scheme sponsors have been making Deficit-Reduction Contributions. Data from the Office for National Statistics covering around 360 large pension schemes (including 100 local authorities and some Defined Contribution (DC) schemes) show that in the year to 31 March 2018, sponsoring employers made £13.5 billion in special contributions compared with £12.2 billion in the year to 31 March 2017.

Analysis of The Pensions Regulator's latest Technical Provisions and recovery plan data shows that in Tranche 11[1], the length of the average recovery plan was 7.8 years, just under a year less than that of Tranche 8 (comparable given the three-year valuation cycle) and 0.3 years longer than Tranche 10. Assets as a percentage of Technical Provisions rose from 82.4 per cent in Tranche 8 to 87.2 per cent in Tranche 11.

The total number of Contingent Assets submitted to the PPF for the 2018/19 levy year was 519, compared with 601 in 2017/18. This reflects a reduction in the number of Type A contingent assets (employer parent or group guarantees).

There were £22 billion worth of risk transfer deals (e.g. longevity swaps, buy-outs, buy-ins) in the year to 30 June 2018, up from £16 billion the previous year, but nevertheless a relatively small amount in the context of the whole universe of schemes.

According to ONS data covering 360 schemes, the value of pension liabilities transferred out of their schemes by pension scheme members amounted to £10.6 billion in Q1 2018, the highest since the introduction of Pensions Freedoms in April 2015 and an all-time high, but again a relatively small amount in the context of the whole universe of schemes.

[1] Tranche 11 covers schemes with valuation dates between 22 September 2015 and 21 September 2016.

Economy and market background

Annual GDP growth fell from 1.8 per cent in the first quarter of 2017 to 1.2 per cent in the first quarter of 2018. The Official Bank Rate rose from 25 to 50 basis points in November 2017 (and then to 75 basis points in August 2018).

The following table sets out how some key market indicators in the assessment of universe scheme assets and s179 liabilities have changed over the year:

Market indicator	**Change over the year to 31 March 2018**
10-year fixed interest gilt yield	+29pp
15-year fixed interest gilt yield	+7pp
20-year fixed interest gilt yield	-2pp
FTSE All-Share Index (Total Return)	+1.25%
FTSE All-World Ex-UK Index (Total Return)	+3.06%

pp = percentage point(s)

02 The data

2.1 Summary

- The main analysis in *The Purple Book 2018* is based on new scheme returns submitted to The Pensions Regulator (TPR) for a dataset of 5,450 Defined Benefit (DB) schemes, covering 10.4 million members[2]. This represents virtually all PPF-eligible schemes and universe liabilities. At the time of writing, complete 2018 information for the remaining schemes was not yet available and so these have been excluded from the sample. These exclusions include one (*The Purple Book 2017*: one) scheme with over 10,000 members.
- It is estimated that the eligible universe of schemes was 5,524 as at 31 March 2018, a reduction from 5,671 at 31 March 2017. The declining universe reflects schemes winding up, scheme mergers, and schemes entering PPF assessment.
- The fact that the dataset accounts for such a large proportion of the universe means that results for the whole universe would only be slightly different from those presented in *The Purple Book 2018*.
- As in previous *Purple Books*, the bulk of the analysis uses funding with pension scheme liability values measured on a section 179 (s179) basis. This is, broadly speaking, what would have to be paid to an insurance company to take on the payment of PPF levels of compensation.

2.2 Sources of data

The information used in Chapters 3 to 8 of this publication comes from three primary sources, as described below.

Scheme returns provided to The Pensions Regulator

Most of the analysis in this year's publication is based on new scheme returns issued in December 2017 and January 2018 and returned by 31 March 2018.

Voluntary form reporting

Electronic forms are available on TPR's website so pension schemes can provide data regarding Contingent Assets (CAs), valuation results on an s179 basis, Deficit-Reduction Contributions (DRCs), the s179 valuation results following block transfers, and Asset-Backed Contributions. More information on DRCs and CAs is given in Chapter 12 (Risk reduction).

[2] One individual can have multiple memberships (for example of different pension schemes). Hence the number of members exceeds the number of individuals.

Sponsor failure scores

From the levy year 2015/16, Experian has given us scores for calculating the PPF levy using the PPF-specific model. This is a statistical model, developed using observed insolvencies among employers and guarantors of DB pension schemes. More detail on the model can be found on our website.

The starting point in establishing the insolvency risk element of the risk-based levy is normally the annual average of a scheme's Experian Monthly Scores. The average Monthly Score is then matched to one of ten levy bands and the corresponding levy rate is used.

The data used in Chapters 9 (PPF levy 2017/18), 10 (Schemes in assessment) and 11 (PPF compensation 2017/18) are derived from the PPF's business operations. The data from Chapter 12 is mostly taken from a variety of public sources, as noted underneath each figure.

2.3 Scheme funding

As in previous *Purple Books*, the bulk of our analysis uses funding estimates on an s179 basis. This is, broadly speaking, what would have to be paid to an insurance company to take on PPF levels of compensation, and estimates of this are what we use in the calculation of scheme-based levies. The analysis in Chapter 4 (Scheme funding) uses data that, as far as possible, reflects the position at 31 March 2018 with the s179 assumptions that came into effect on 1 December 2016. As in previous years, PPF actuaries have also produced full buy-out estimates (i.e. based on original scheme levels of compensation) of the funding position for *The Purple Book 2018* dataset.

2.4 The PPF-eligible DB universe and *The Purple Book 2018* dataset

The PPF covers certain DB occupational schemes and DB elements of hybrid schemes. Some DB schemes will be exempt from the PPF, including[3]:

- unfunded public sector schemes,
- some funded public sector schemes, for example, those providing pensions to local government employees,
- schemes to which a Minister of the Crown has given a guarantee,
- schemes with fewer than two members, and
- schemes which began to wind up, or were completely wound up, before 6 April 2005.

[3] For a more comprehensive list see 'eligible schemes' on our website.

The Purple Book 2018 sample covers almost all of the estimated PPF-eligible schemes.

Figure 2.1 | Distribution of schemes excluding those in assessment by size of scheme membership as at 31 March 2018

Number of members	2-99	100-999	1,000-4,999	5,000-9,999	10,000+	Total
Estimated 2018 universe (number of schemes)	1,985	2,411	759	171	198	**5,524**
The Purple Book 2018 dataset (number of schemes)	1,934	2,392	756	171	197	**5,450**
The Purple Book 2018 dataset as a % of 2018 PPF-eligible DB universe	97.4%	99.2%	99.6%	100.0%	99.5%	**98.7%**

Source: PPF

Large schemes with over 5,000 members make up 7 per cent of the total number of schemes in *The Purple Book 2018* dataset but around 75 per cent of each of total assets, liabilities and members.

Figure 2.2 | Distribution of assets, s179 liabilities and members in *The Purple Book 2018* dataset as at 31 March 2018

Number of members	2-99	100-999	1,000-4,999	5,000-9,999	10,000+	Total
Assets (£b)	16.5	136.1	258.0	193.5	969.2	**1,573.3**
s179 liabilities (£b)	16.1	146.5	278.4	202.3	1,000.5	**1,643.8**
Number of members (000's)	84	838	1,720	1,200	6,540	**10,382**

Source: PPF

Figure 2.3 | *Purple Book* datasets

Purple Book **dataset**	**Number of schemes**
2010	6,596
2011	6,432
2012	6,316
2013	6,150
2014	6,057
2015	5,945
2016	5,794
2017	5,588
2018	5,450

Source: PPF

The declining universe reflects schemes winding up, scheme mergers and schemes transferring into the PPF.

03 Scheme demographics

3.1 Summary

This chapter describes the dataset used for this year's edition of *The Purple Book* and includes some comparisons with data from previous years. Figures for the total number of schemes and total scheme membership are included, with breakdowns by scheme size, scheme status, and member status.

How we categorise schemes has varied in previous editions of *The Purple Book* as more informative breakdowns became available. For more detailed information, see the appendix.

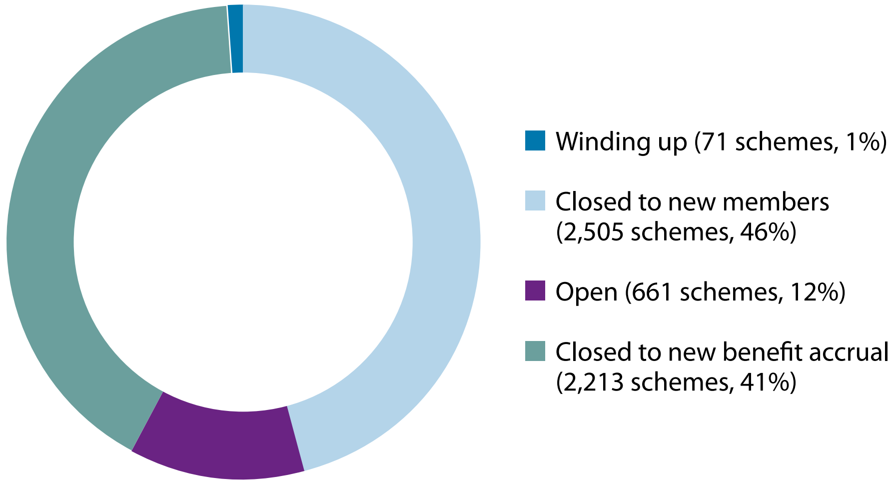
Some statistics from this chapter are summarised in the following table:

	Date of ***Purple Book***	
	31 March 2018	**31 March 2017**
Number of schemes in *The Purple Book* dataset	5,450	5,588
Proportion of schemes that are:		
open to new members	12%	12%
closed to new members (but open to new benefit accrual)	46%	47%
closed to new benefit accrual	41%	39%
winding up	1%	2%
Number of members covered by schemes in *The Purple Book* dataset, of which:	10.4m	10.5m
pensioner members	41%	40%
deferred members	47%	47%
active members (still accruing benefits)	12%	12%

- The number of active members is less than half of those found in the first *Purple Book* dataset in 2006.
- In line with the recent trend, there has been little change in the proportion of schemes that are open to new members, at 12 per cent (this contrasts with a rapid closure of schemes in the period 2006 to 2010). However, open schemes account for 21 per cent of universe members.
- 74 per cent of schemes have total asset values of less than £100 million.

3.2 Scheme status

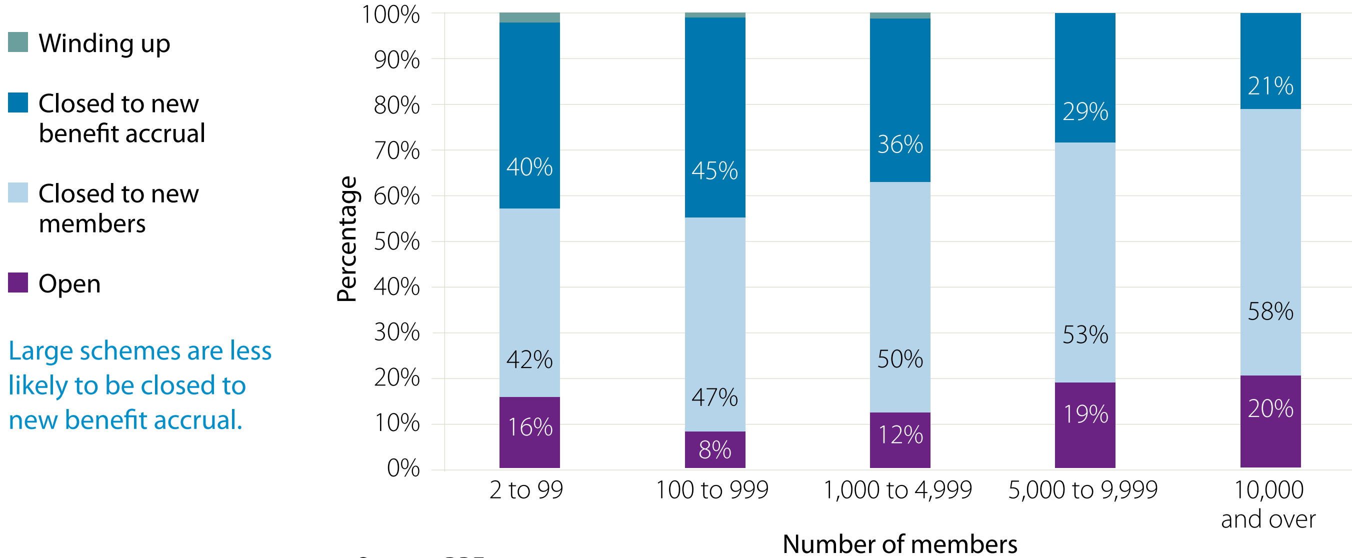
Figure 3.1 | Distribution of schemes by scheme status



Source: PPF

46 per cent of schemes are closed to new members, and another 41 per cent are also closed to new benefit accrual.

Figure 3.2 | Distribution of schemes by scheme status and member group



Large schemes are less likely to be closed to new benefit accrual.

Source: PPF

Note: the percentages may not sum to 100 per cent because of rounding.

Figure 3.3 | Distribution of schemes by scheme status and year

Percentage of schemes	Open	Closed to new members	Closed to new benefit accrual	Winding up
2006	43%	44%	12%	1%
2007	36%	45%	16%	2%
2008	31%	50%	17%	2%
2009	27%	52%	19%	2%
2010	18%	58%	21%	2%
2011	16%	58%	24%	2%
2012	14%	57%	26%	2%
2013	14%	54%	30%	2%
2014	13%	53%	32%	2%
2015	13%	51%	34%	2%
2016	13%	50%	35%	2%
2017	12%	47%	39%	2%
2018	12%	46%	41%	1%

The distribution of schemes by scheme status is broadly unchanged from 2017.

Source: PPF

Note: the percentages may not sum to 100 per cent because of rounding.

Figure 3.4 | Distribution of schemes by scheme status and year (excluding hybrid schemes[4])

Percentage of schemes	Open	Closed to new members	Closed to new benefit accrual	Winding up
2006	35%	49%	15%	1%
2007	33%	49%	17%	1%
2008	26%	52%	19%	3%
2009	22%	55%	20%	3%
2010	21%	54%	23%	2%
2011	18%	54%	26%	2%
2012	17%	53%	29%	2%
2013	16%	51%	31%	2%
2014	15%	50%	33%	2%
2015	14%	49%	35%	2%
2016	14%	47%	37%	2%
2017	13%	45%	40%	2%
2018	13%	44%	42%	1%

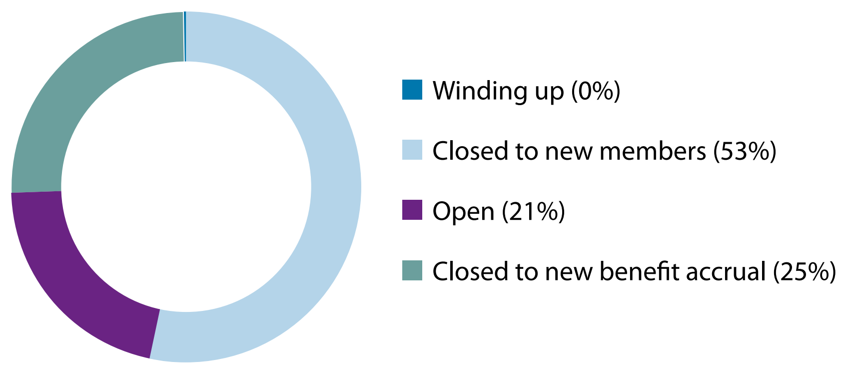
The distribution of schemes by status in *The Purple Book 2018* dataset is similar whether or not hybrid schemes are excluded.

Source: PPF

Note: the percentages may not sum to 100 per cent because of rounding.

3.3 Scheme status and scheme members

Figure 3.5 | Distribution of members by scheme status



21 per cent of members are in schemes that are open to new members with a further 53 per cent in schemes that are closed to new members but open to new benefit accrual.

Source: PPF

[4] A hybrid scheme is one that provides defined benefit (DB) and defined contribution (DC) benefits. The treatment of such schemes has varied in past editions of *The Purple Book* as better data has become available (see the appendix for a detailed explanation). At present we define a scheme as closed if the DB section is closed, even if the DC section remains open.

The proportion of members in open schemes has declined from 66 per cent in 2006 to 21 per cent in 2018.

Figure 3.6 | Distribution of members by scheme status and year

Percentage of members	Open	Closed to new members	Closed to new benefit accrual	Winding up
2006	66%	32%	2%	1%
2007	50%	46%	3%	0%
2008	44%	52%	4%	0%
2009	37%	59%	4%	0%
2010	34%	60%	5%	1%
2011	31%	62%	6%	0%
2012	28%	64%	8%	0%
2013	23%	65%	12%	0%
2014	22%	62%	15%	0%
2015	22%	62%	16%	0%
2016	19%	60%	20%	1%
2017	21%	55%	24%	0%
2018	21%	53%	25%	0%

Source: PPF

Note: the percentages may not sum to 100 per cent because of rounding.

Excluding hybrid schemes had a large effect on the distribution of members by scheme status in *The Purple Book 2018* dataset. This is due to one very large scheme changing from pure DB to hybrid status.

Figure 3.7 | Distribution of members by scheme status and year (excluding hybrid schemes)

Percentage of members	Open	Closed to new members	Closed to new benefit accrual	Winding up
2006	35%	49%	15%	1%
2007	55%	41%	3%	0%
2008	46%	49%	4%	0%
2009	38%	57%	5%	0%
2010	38%	56%	6%	1%
2011	34%	58%	8%	0%
2012	30%	61%	9%	0%
2013	27%	61%	11%	0%
2014	25%	60%	14%	1%
2015	24%	59%	16%	1%
2016	19%	56%	24%	1%
2017	19%	53%	27%	1%
2018	14%	54%	32%	0%

Source: PPF

Note: the percentages may not sum to 100 per cent because of rounding.

3.4 Scheme membership

The distribution of member types is similar to the previous year.

Figure 3.8 | Number and distribution of members by member type and scheme status, 31 March 2018

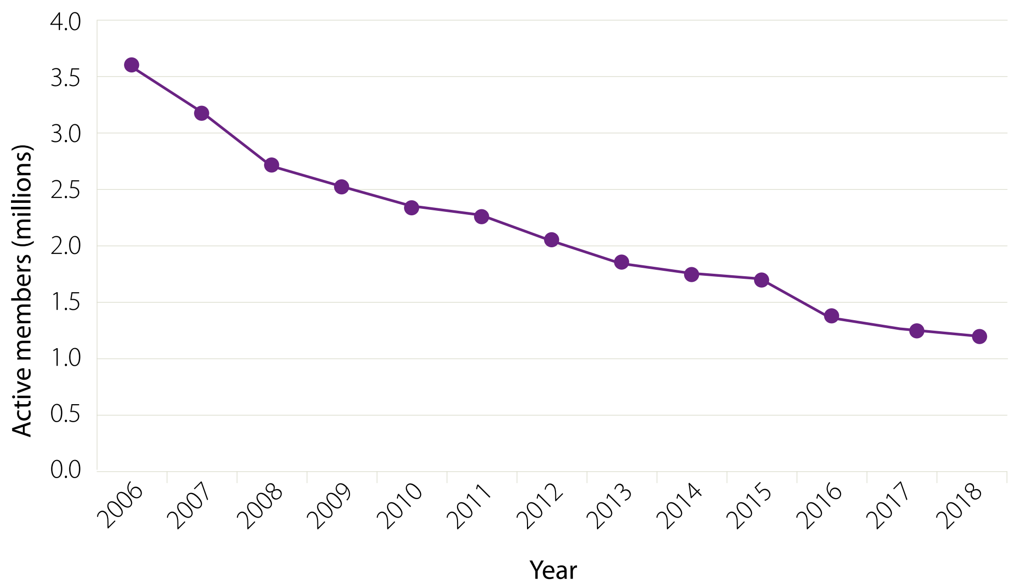
Number (1000's)/%	Open	Closed to new members	Closed to new benefit accrual	Winding up	All
Active members	661.3 6%	614.3 6%	- 0%	- 0%	**1,275.6** **12%**
Deferred members	808.6 8%	2,474.8 24%	1,568.1 15%	11.7 0%	**4,863.1** **47%**
Pensioner members	711.9 7%	2,449.0 24%	1,063.9 10%	18.7 0%	**4,243.5** **41%**
Total	**2,181.8** **21%**	**5,538.1** **53%**	**2,632.0** **25%**	**30.4** **0%**	**10,382.2** **100%**

Source: PPF

Note: the components may not sum to the total because of rounding.

The number of active members in the PPF universe has been falling since 2006.

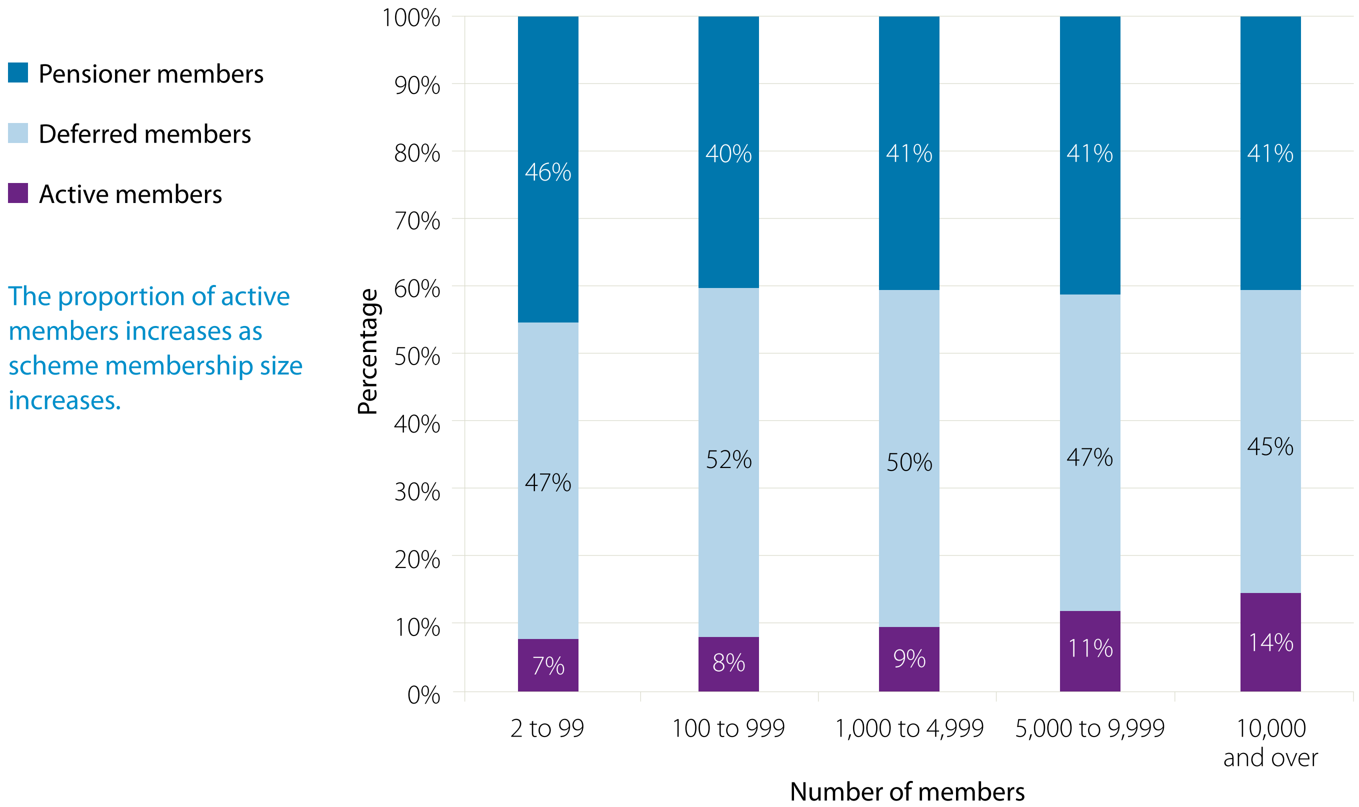
Figure 3.9 | Active members in *Purple Book* datasets



Source: PPF

Figure 3.10 | Distribution of member type, by scheme membership size

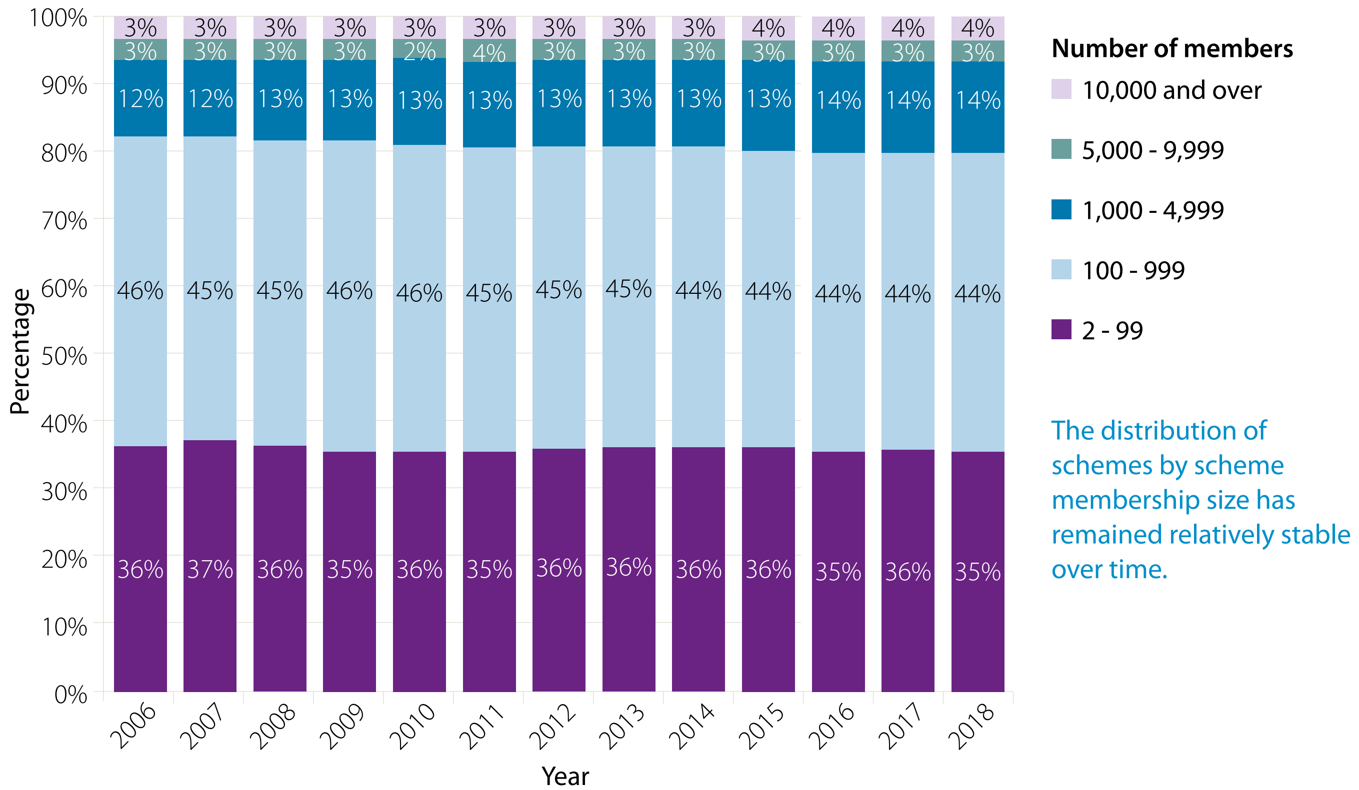
The proportion of active members increases as scheme membership size increases.



Source: PPF

Note: the percentages may not sum to 100 per cent because of rounding.

Figure 3.11 | Proportion of schemes by scheme membership size, by year



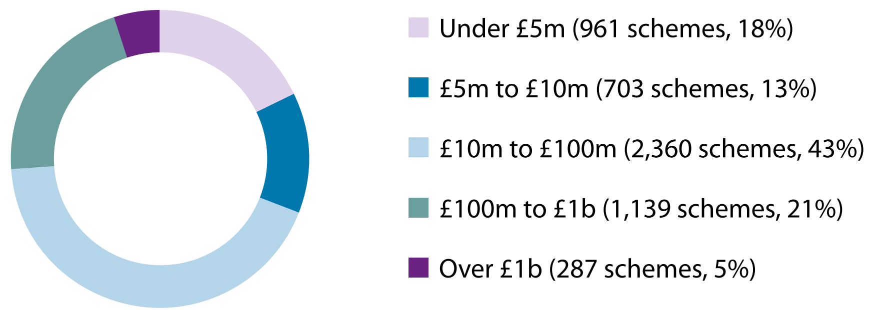
The distribution of schemes by scheme membership size has remained relatively stable over time.

Source: PPF

Note: the percentages may not sum to 100 per cent because of rounding.

3.5 Asset size

Figure 3.12 | Distribution of schemes by asset size



74 per cent of schemes have assets of less than £100 million.

Source: PPF

04 Scheme funding

4.1 Summary

This chapter covers funding on an s179 basis as at 31 March 2018[5]. Funding information supplied in scheme returns submitted to The Pensions Regulator (TPR) is processed so the funding levels can be estimated at a common date, allowing us to use consistent totals. In *The Purple Book* we have added Deficit-Reduction Contributions (DRCs), as submitted for levy purposes, to the asset values submitted in s179 valuations.

A scheme that is 100 per cent funded on an s179 basis has broadly enough assets to pay an insurance company to take on the scheme with PPF levels of compensation.

In addition, this chapter considers estimated full buy-out funding information. This has been calculated using the same valuation assumptions and underlying data as for the s179 calculations but includes an approximate allowance for the difference between the PPF level of compensation and full scheme benefits.

Some of the statistics summarising these calculations are shown below:

	The Purple Book	
Item	**31 March 2018**	**31 March 2017**
Net funding position (£b)	70.5 deficit	161.8 deficit
s179 liabilities (£b)	1,643.8	1,702.9
Assets (£b)	1,573.3	1,541.1
Funding level:		
s179 basis	95.7%	90.5%
Estimated full buy-out basis	72.9%	67.7%

The following table sets out how some of those market indicators used to assess and roll forward pension scheme assets and s179 liabilities have changed over the year:

Market indicator	**Change over the year to 31 March 2018**
10-year fixed interest gilt yield	+29pp
15-year fixed interest gilt yield	+7pp
20-year fixed interest gilt yield	-2pp
5-15-year index-linked gilt yield	+34pp
FTSE All-Share Index (Total Return)	+1.25%
FTSE All-World Ex-UK Index (Total Return)	+3.06%

pp = percentage point(s)

- The impact of market movements alone would have resulted in an increase in the s179 funding level of around 2.6 percentage points, due to higher gilt yields driving down liability values and a rise in equity markets helping to increase asset values.
- The other 2.6 percentage point increase in funding level is due to us updating to the new *Purple Book 2018* dataset, which allows for more up-to-date scheme valuations and a shrinking universe.
- Funding levels are higher among:
    - more mature schemes (i.e. those with a higher proportion of liabilities that relate to pensioners), and
    - the smallest and largest schemes (compared to mid-size schemes).
- Since 2010, the proportion of liabilities that relates to pensioner members has remained relatively stable at around 40 per cent, whereas the proportion relating to active members has reduced from 32 per cent to 23 per cent.

[5] Latest effective s179 assumptions guidance is available on our website.

4.2 Overall funding

The net s179 funding position of the schemes in *The Purple Book 2018* dataset at 31 March 2018 was a deficit of £70.5 billion, corresponding to a funding level of 95.7 per cent.

Figure 4.1 | Key funding statistics as at 31 March 2018

	s179	Estimated full buy-out
Total number of schemes	5,450	5,450
Total assets (£b)	1,573.3	1,573.3
Total liabilities (£b)	1,643.8	2,157.3
Net funding position (£b)	-70.5	-584.0
Aggregate funding level	95.7%	72.9%
Number of schemes in deficit	3,449	3,449
Number of schemes in surplus	2,001	2,001
Net funding position for schemes in deficit (£b)	-187.6	-594.3
Net funding position for schemes in surplus (£b)	117.1	10.3

Source: PPF

Note: for this chapter we deem a scheme to be 'in deficit' if its s179 liabilities exceed its assets.

Figure 4.2 | Current and historical funding figures on an s179 basis

Year	Number of schemes	Total assets (£b)	s179					
			Liabilities (£b)	Net funding position (£b)	Aggregate funding level	Deficit of schemes in deficit (£b)	Surplus of schemes in surplus (£b)
2006	7,751	769.5	792.2	-22.7	97.1%	-76.3	53.5
2007	7,542	837.7	769.9	67.8	108.8%	-46.8	96.5
2008	6,897	837.2	842.3	-5.1	99.4%	-67.7	62.6
2009	6,885	780.4	981.0	-200.6	79.6%	-216.7	16.0
2010	6,596	926.2	887.9	38.3	104.3%	-49.1	87.4
2011	6,432	968.5	969.7	-1.2	99.9%	-78.3	77.1
2012	6,316	1,026.8	1,231.0	-204.2	83.4%	-231.3	27.1
2013	6,150	1,118.5	1,329.2	-210.8	84.1%	-245.8	35.0
2014	6,057	1,137.5	1,176.8	-39.3	96.7%	-119.0	79.7
2015	5,945	1,298.3	1,542.5	-244.2	84.2%	-285.3	41.1
2016	5,794	1,341.4	1,563.1	-221.7	85.8%	-273.5	51.8
2017	5,588	1,541.1	1,702.9	-161.8	90.5%	-246.7	84.9
2018	5,450	1,573.3	1,643.8	-70.5	95.7%	-187.6	117.1

Source: PPF

The aggregate s179 funding level as at 31 March 2018 was 95.7 per cent, up from 90.5 per cent a year earlier. Total liability values decreased by 3.5 per cent and total assets increased by 2.1 per cent.

Figure 4.3 | Current and historical funding figures on an estimated full buy-out basis

Year	Total assets (£b)	Estimated full buy-out					
		Liabilities (£b)	Net funding position (£b)	Aggregate funding level	Deficit of schemes in deficit (£b)	Surplus of schemes in surplus (£b)
2006	769.5	1,273.5	-504.0	60.4%	n/a	n/a
2007	837.7	1,289.3	-451.6	65.0%	n/a	n/a
2008	837.2	1,356.0	-518.6	61.7%	-520.4	1.6
2009	780.4	1,351.6	-571.2	57.7%	-572.3	1.1
2010	926.2	1,359.2	-433.0	68.1%	-436.5	3.5
2011	968.5	1,435.5	-467.0	67.5%	-470.7	3.7
2012	1,026.8	1,702.6	-675.8	60.3%	-677.3	1.5
2013	1,118.5	1,826.7	-708.2	61.2%	-709.9	1.7
2014	1,137.5	1,690.3	-552.8	67.3%	-558.2	5.4
2015	1,298.3	2,099.2	-800.9	61.8%	-804.9	4.0
2016	1,341.4	2,121.3	-779.9	63.2%	-784.0	4.1
2017	1,541.1	2,277.3	-736.2	67.7%	-741.6	5.4
2018	1,573.3	2,157.3	-584.0	72.9%	-594.3	10.3

Source: PPF

The aggregate estimated full buy-out funding level increased from 67.7 per cent to 72.9 per cent over the year to 31 March 2018, and the net funding position improved from a deficit of £736.2 billion to a deficit of £584.0 billion.

4.3 Analysis of funding by scheme membership size

The best funded schemes were the smallest, with an aggregate s179 funding level of 102.5 per cent for schemes with fewer than 100 members.

Figure 4.4 | s179 funding levels by size of scheme membership as at 31 March 2018

Scheme size (members)	Number of schemes	Total assets (£b)	Liabilities (£b)	Net funding position (£b)	Aggregate funding level	Simple average funding level*
2 to 99	1,934	16.5	16.1	0.4	102.5%	100.2%
100 to 999	2,392	136.1	146.5	-10.4	92.9%	90.3%
1,000 to 4,999	756	258.0	278.4	-20.4	92.7%	90.6%
5,000 to 9,999	171	193.5	202.3	-8.8	95.7%	93.7%
10,000 and over	197	969.2	1,000.5	-31.3	96.9%	97.8%
Total	**5,450**	**1,573.3**	**1,643.8**	**-70.5**	**95.7%**	**94.2%**

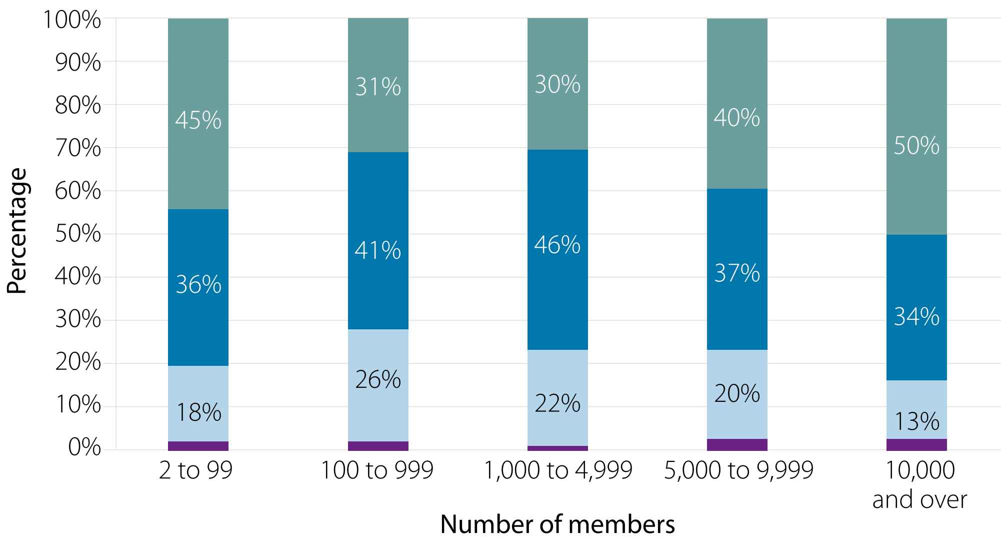
Source: PPF

* Whereas aggregate funding levels are determined by comparing the total assets and liabilities for all schemes, the simple average funding level is the average of all of the schemes' individual funding levels. Note that 23 schemes with funding levels over 200 per cent (on an estimated full buy-out measure) were excluded from the simple averages to avoid distortions.

Figure 4.5 | Distribution of s179 funding levels by size of scheme membership as at 31 March 2018

s179 funding level

- Over 100%
- 75% to 100%
- 50% to 75%
- 0% to 50%



Schemes with 10,000 or more members are less likely to have an s179 funding level under 75 per cent.

Source: PPF

Note: the percentages in each column may not sum to 100 because of rounding.

Figure 4.6 | Estimated full buy-out levels by size of scheme membership as at 31 March 2018

Members (number)	Number of schemes	Total assets (£b)	Liabilities (£b)	Net funding position (£b)	Aggregate funding level	Simple average funding level*
2 to 99	1,934	16.5	21.0	-4.5	78.6%	76.8%
100 to 999	2,392	136.1	190.3	-54.2	71.5%	69.1%
1,000 to 4,999	756	258.0	364.3	-106.3	70.8%	69.2%
5,000 to 9,999	171	193.5	264.4	-70.9	73.2%	69.5%
10,000 and over	197	969.2	1,317.3	-348.2	73.6%	74.1%
Total	**5,450**	**1,573.3**	**2,157.3**	**-584.0**	**72.9%**	**72.1%**

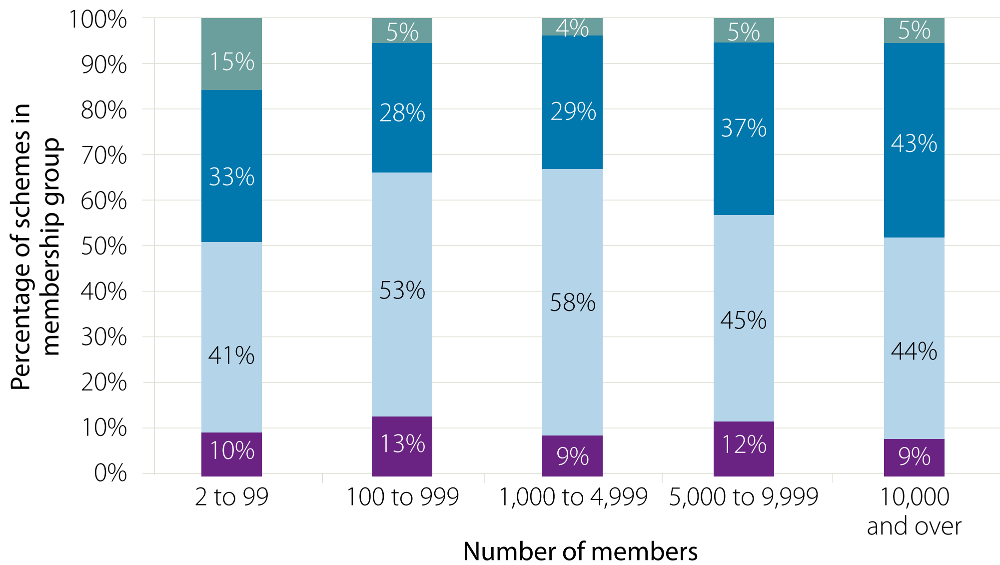
The best funded schemes were the smallest, with an aggregate buy-out funding level of 78.6 per cent for schemes with fewer than 100 members.

Source: PPF

Note: the columns may not sum to the totals due to rounding.

*23 schemes with funding levels over 200 per cent (on an estimated full buy-out measure) were excluded from the simple averages to avoid distortions.

Figure 4.7 | Distribution of estimated full buy-out funding levels by size of scheme membership as at 31 March 2018



Estimated full buy-out funding level

- Over 100%
- 75% to 100%
- 50% to 75%
- 0% to 50%

Schemes with fewer than 100 members, or more than 10,000 members, are less likely to have an estimated full buy-out funding level under 75 per cent.

Source: PPF

Note: the percentages in each column may not sum to 100 because of rounding.

4.4 Analysis of funding by scheme maturity

Maturity is measured here as the percentage of the scheme liabilities relating to pensioners.

More mature schemes tend to have higher funding levels.

Figure 4.8 | Analysis of s179 funding levels by scheme maturity as at 31 March 2018

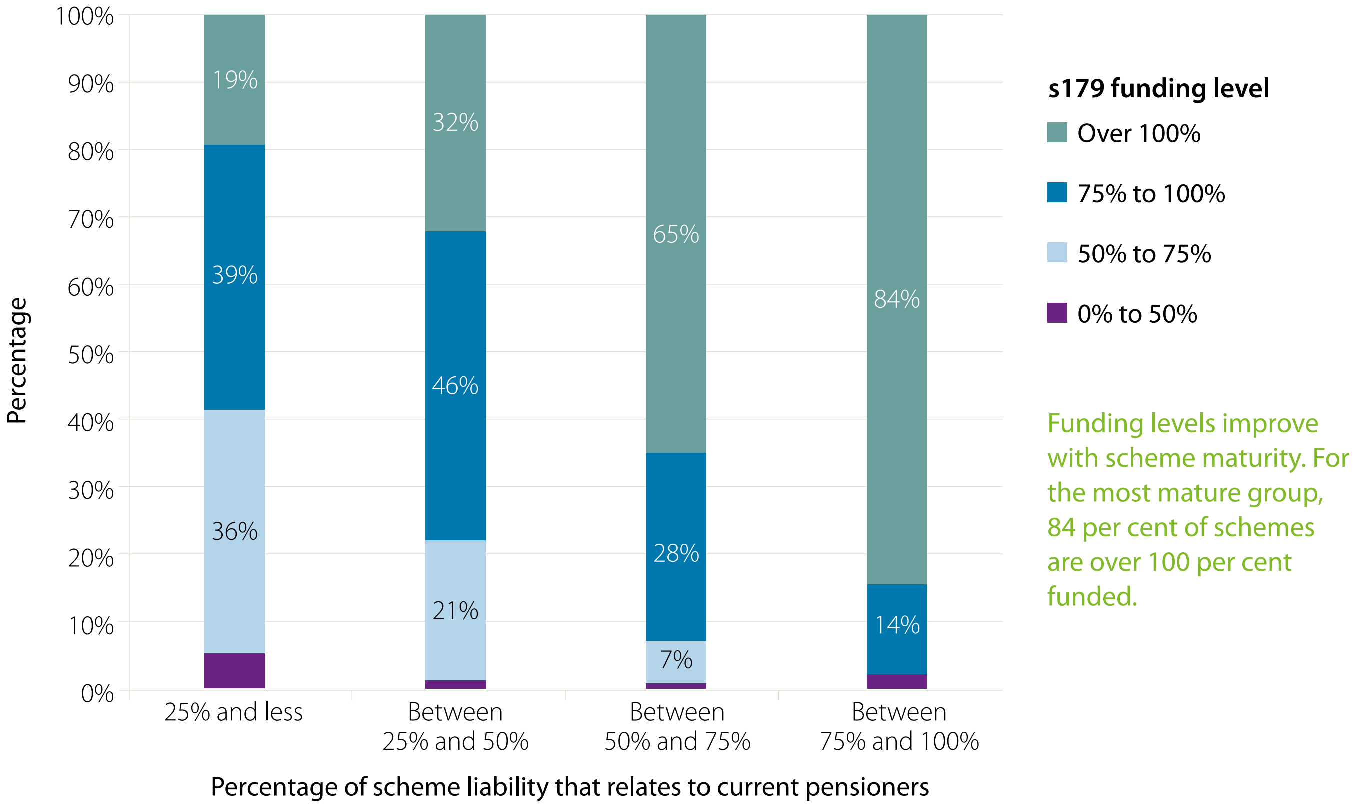
Proportion of s179 liabilities relating to pensioners	Number of schemes	Total assets (£b)	Liabilities (£b)	Net funding position (£b)	Aggregate funding level	Simple average funding level*
25% and less	1,512	224.9	285.8	-61.0	78.7%	82.8%
Between 25% and 50%	2,692	962.9	1,006.5	-43.6	95.7%	91.9%
Between 50% and 75%	1,040	349.9	324.3	25.5	107.9%	110.6%
Between 75% and 100%	206	35.7	27.1	8.6	131.7%	128.4%
Total	**5,450**	**1,573.3**	**1,643.8**	**-70.5**	**95.7%**	**94.2%**

Source: PPF

Note: the components may not sum to the totals because of rounding.

*23 schemes with funding levels over 200 per cent (on an estimated full buy-out measure) were excluded from the simple averages to avoid distortions.

Figure 4.9 | Distribution of funding levels on an s179 basis by scheme maturity as at 31 March 2018



Funding levels improve with scheme maturity. For the most mature group, 84 per cent of schemes are over 100 per cent funded.

Source: PPF

Note: the percentages of each column may not sum to 100 because of rounding.

4.5 Analysis of funding by scheme status

Schemes that were open to new members were the worst funded, with an aggregate funding level of 84.3 per cent.

Figure 4.10 | Analysis of s179 funding levels by scheme status as at 31 March 2018

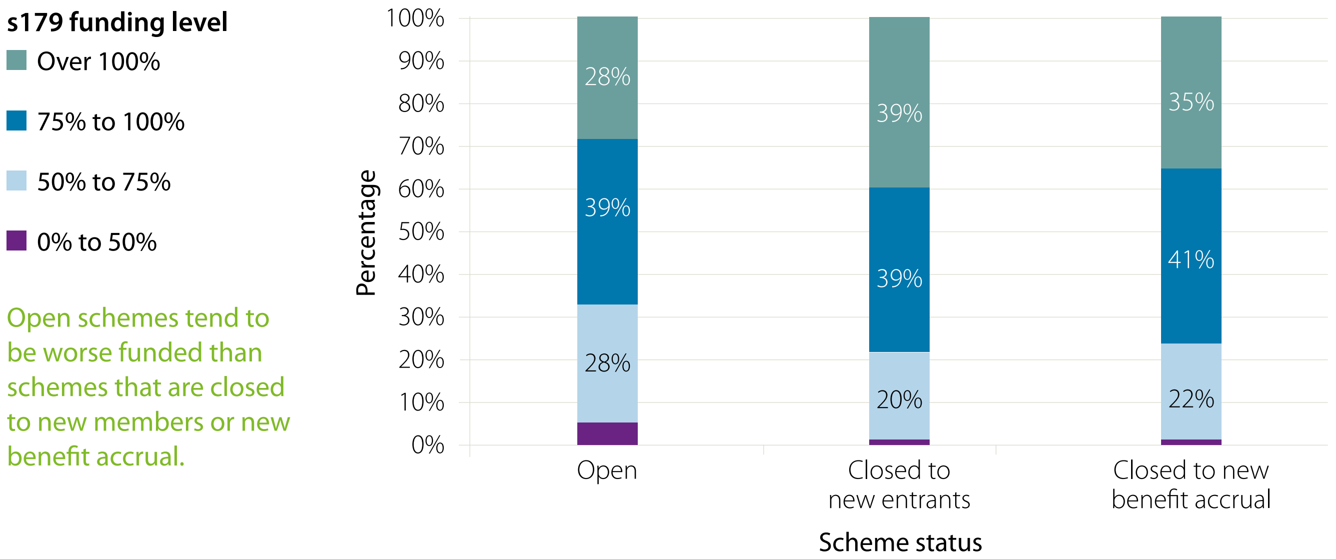
Status	Number of schemes	Total assets (£b)	Liabilities (£b)	Net funding position (£b)	Aggregate funding level	Simple average funding level*
Open	661	281.0	333.2	-52.1	84.3%	88.1%
Closed to new members	2,505	969.5	971.2	-1.6	99.8%	96.3%
Closed to new benefit accrual	2,213	319.2	336.1	-16.9	95.0%	93.2%
Winding up	71	3.6	3.4	0.2	105.9%	111.5%
Total	**5,450**	**1,573.3**	**1,643.8**	**-70.5**	**95.7%**	**94.2%**

Source: PPF

Note: the components may not sum to the totals because of rounding.

*23 schemes with funding levels over 200 per cent (on an estimated full buy-out measure) were excluded from the simple averages to avoid distortions.

Figure 4.11 | Distribution of schemes by s179 funding levels within scheme status groups as at 31 March 2018



Open schemes tend to be worse funded than schemes that are closed to new members or new benefit accrual.

Source: PPF

Note: the percentages of each column may not sum to 100 because of rounding.

Figure 4.12 | Analysis of estimated full buy-out funding levels by scheme status as at 31 March 2018

Status	Number of schemes	Total assets (£b)	Liabilities (£b)	Net funding position (£b)	Aggregate funding level	Simple average funding level*
Open	661	281.0	429.7	-148.7	65.4%	70.4%
Closed to new members	2,505	969.5	1,281.2	-311.6	75.7%	73.6%
Closed to new benefit accrual	2,213	319.2	441.8	-122.6	72.2%	70.6%
Winding up	71	3.6	4.7	-1.1	76.6%	83.1%
Total	**5,450**	**1,573.3**	**2,157.3**	**-584.0**	**72.9%**	**72.1%**

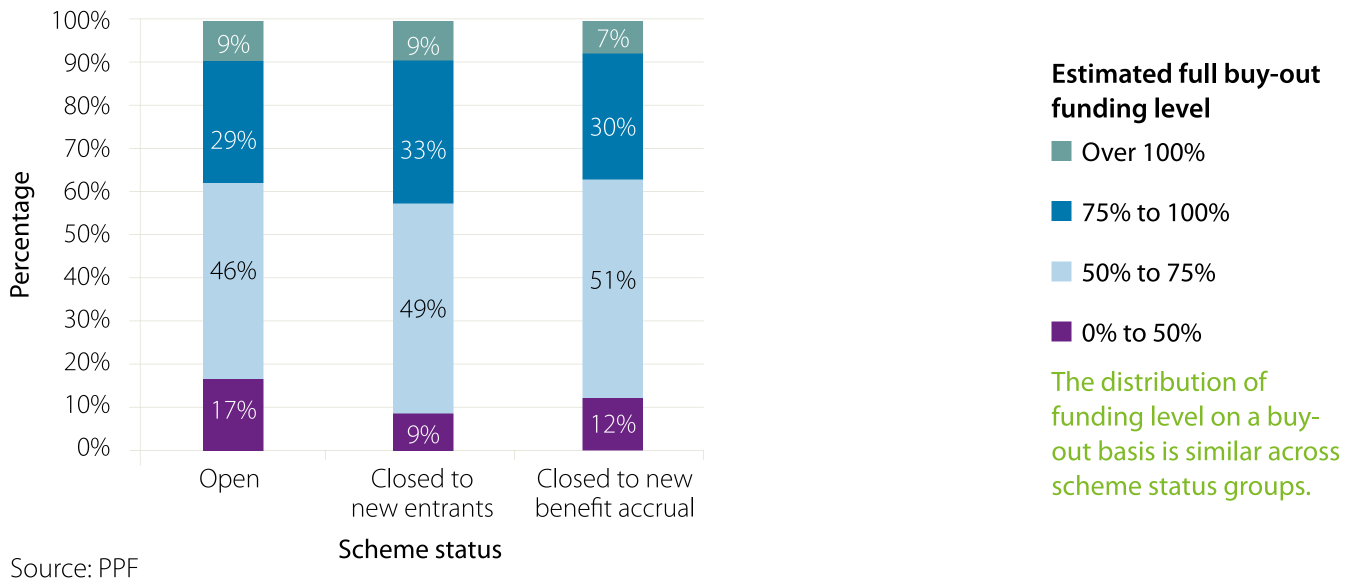
Open schemes are worse funded than closed schemes, as measured by the aggregate buy-out funding level.

Source: PPF

Note: the components may not sum to the totals because of rounding.

*23 schemes with funding levels over 200 per cent (on a full buy-out measure) were excluded from the simple averages to avoid distortions.

Figure 4.13 | Distribution of schemes by estimated full buy-out funding levels within scheme status groups as at 31 March 2018

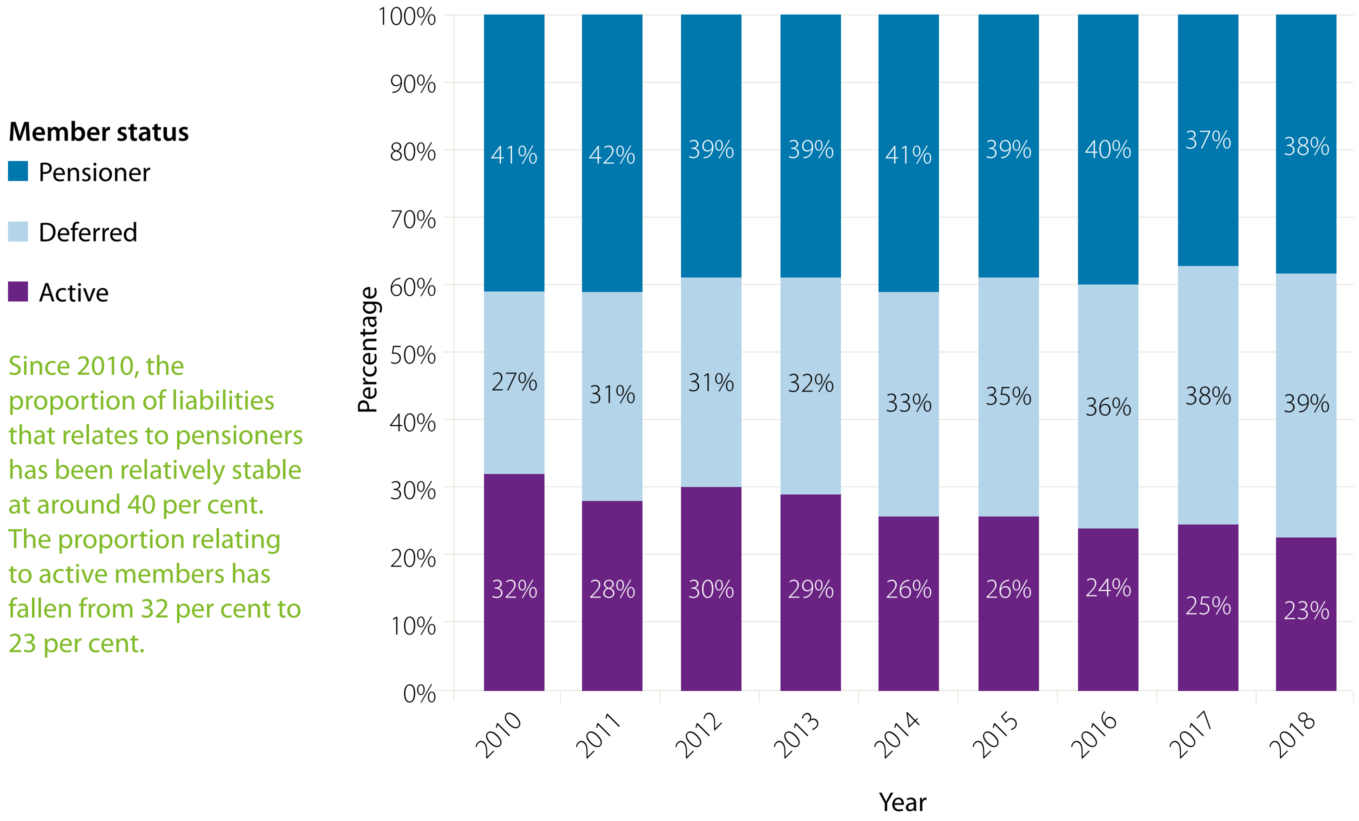


The distribution of funding level on a buy-out basis is similar across scheme status groups.

Source: PPF

Note: the percentages of each column may not sum to 100 per cent because of rounding.

Figure 4.14 | s179 liabilities by member status in current and historical *Purple Book* datasets



Source: PPF

Note: the percentages in each column may not sum to 100 per cent because of rounding.

Since 2010, the proportion of liabilities that relates to pensioners has been relatively stable at around 40 per cent. The proportion relating to active members has fallen from 32 per cent to 23 per cent.

05 Funding sensitivities

5.1 Summary

- Section 5.2 of Chapter 5 gives the historical changes in section 179 (s179) scheme funding since 2006. The series in this section take the estimated funding position at 31 March in previous years' *Purple Books*.
- The estimated funding position of the universe of schemes can change over time owing to changes in a number of factors including financial markets, actuarial assumptions, the decline in the number of Defined Benefit (DB) schemes, and sponsoring employers' special contributions.
- Section 5.3 gives various funding sensitivities. All of these are on an s179 basis, taking the funding position as at 31 March 2018[6] as the base and using *The Purple Book 2018* dataset.

Change in s179 funding position over time

- Both the historical net funding position (total assets less total liabilities) and funding level had been trending downwards since 2006, although by March 2018 both had increased from their all-time lows in August 2016 to levels last seen in spring 2014.
- The proportion of schemes in deficit on an s179 basis was around 63 per cent in March 2018, which is lower than the average (since March 2006) of 73 per cent.

Funding sensitivities as at 31 March 2018

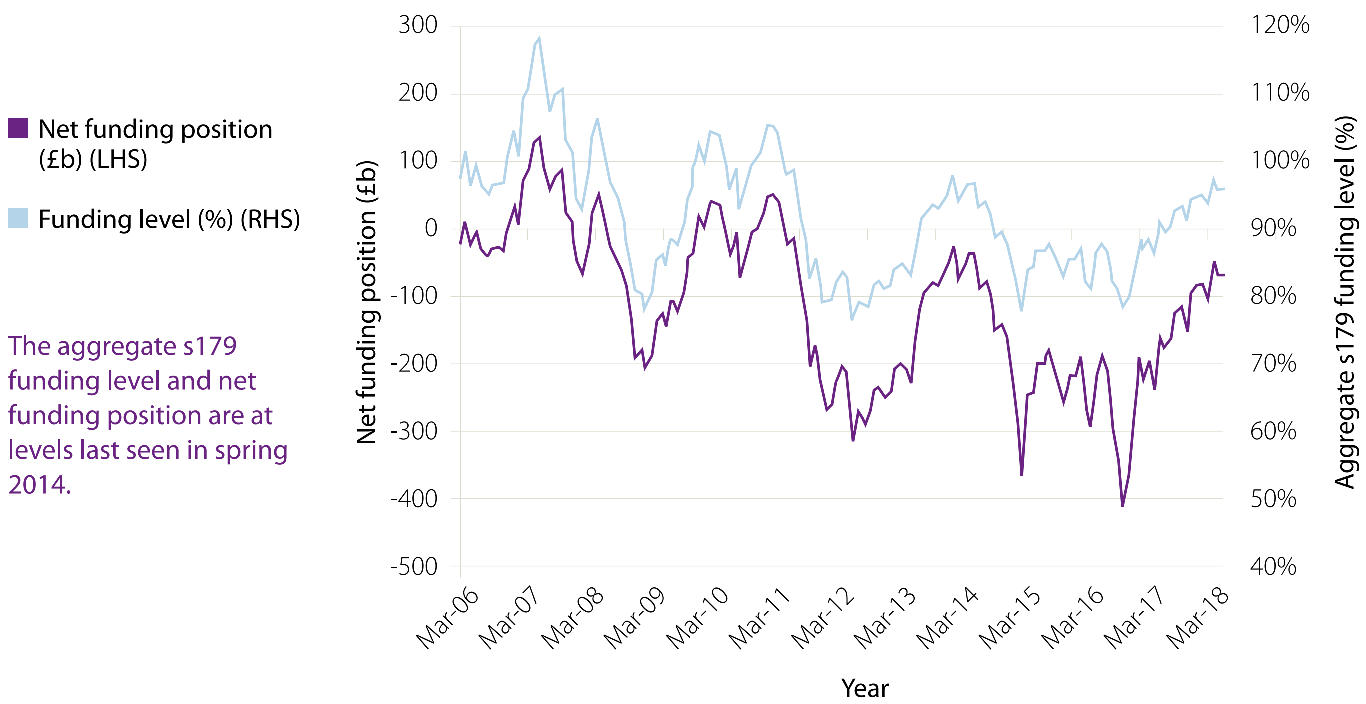
- A 0.1 percentage point (10 basis point) rise in both nominal and real gilt yields improves the 31 March 2018 net funding position by £21.2 billion from -£70.5 billion to -£49.3 billion. A five per cent rise in equity prices would improve the net funding position by a similar amount.
- A 0.1 percentage point (10 basis point) reduction in both nominal and real gilt yields raises aggregate scheme liabilities by 2.0 per cent and raises aggregate scheme assets by 0.7 per cent. A five per cent rise in equity markets raises scheme assets by 1.4 per cent.
- An increase in life expectancy such that the experienced life expectancy is now equivalent to that of individuals two years younger would increase schemes' liabilities by 7.3 per cent, or £120.4 billion.

[6] Using the valuation guidance as in Chapter 4. For more information, see our website.

5.2 Historical changes in s179 scheme funding since 2006

The estimated funding position of schemes can change over time owing to changes in a number of factors including financial markets, actuarial assumptions, the decline in the number of DB schemes, and sponsoring employers' special contributions. The historical series in this section take the estimated funding position at 31 March from previous *Purple Books*. The monthly profiles between end-March of one year and end–February of the next are obtained by rolling forward the assets and liabilities using movements in nominal and real gilt yields and equity markets.

Figure 5.1 | Historical s179 aggregate funding level and net funding position of pension schemes in *The Purple Book* datasets



Source: PPF

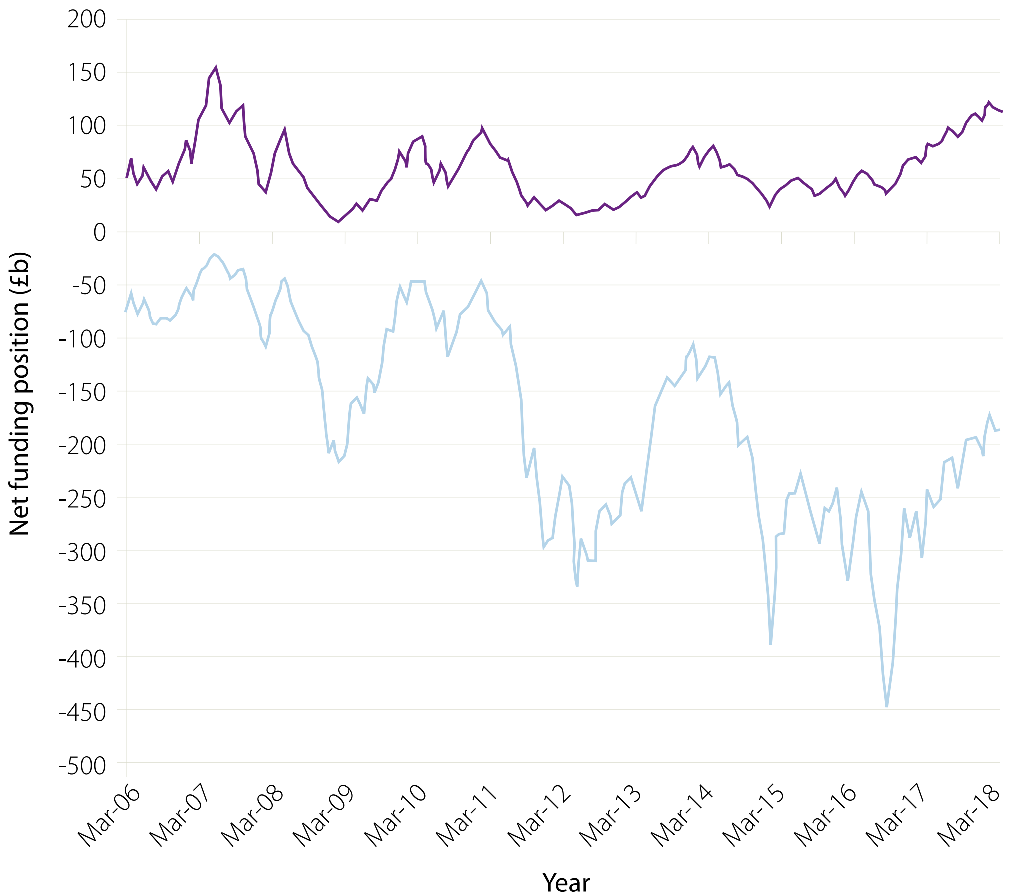
The aggregate s179 funding level and net funding position are at levels last seen in spring 2014.

Figure 5.2 | Historical movements in assets and s179 liabilities of schemes in *The Purple Book* datasets

Source: PPF

There has been a general upward trend in both assets and liabilities since 2006.

Figure 5.3 | Historical aggregate funding position for schemes in deficit and surplus



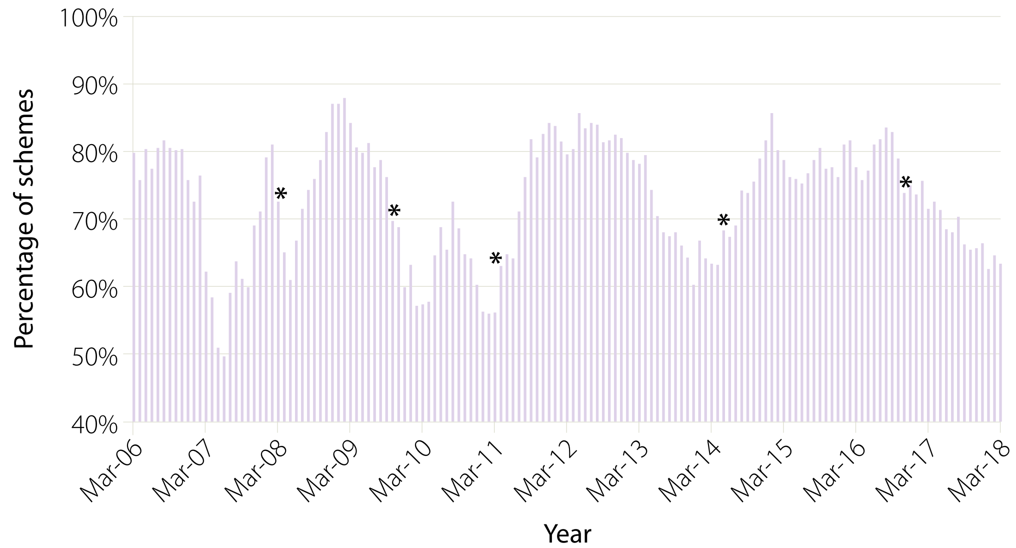
■ Schemes in surplus

■ Schemes in deficit

Source: PPF

The deficit of schemes in deficit was at its largest in August 2016 at £451 billion. At 31 March 2018 this deficit had fallen to around £190 billion.

Figure 5.4 | Historical percentage of schemes in deficit each month in *The Purple Book* datasets*

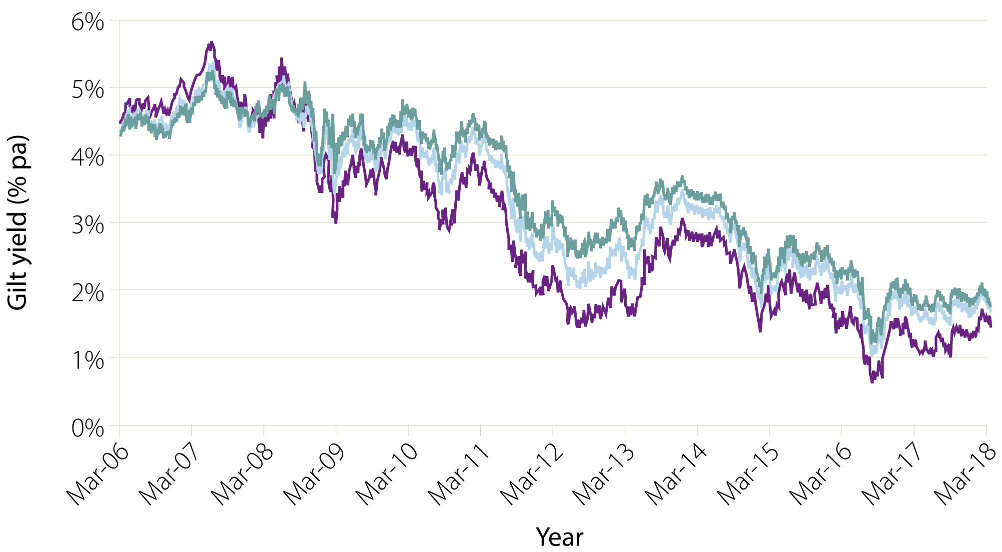


Source: PPF

*The changes to assumptions in March 2008 and October 2009 reduced the number of schemes in deficit by 412 and 566, respectively, while the changes to assumptions in April 2011 and May 2014 raised the number of schemes in deficit by 107 and 259, respectively. The changes to assumptions in November 2016 reduced the number of schemes in deficit by 157.

In March 2018, around 63 per cent of schemes were in deficit.

Figure 5.5 | Movements in gilt yields



Source: Bloomberg

Gilt yields reached their all-time low in August 2016, but have since recovered a little.

Figure 5.6 | Movements in equity indices

Source: Bloomberg

The FTSE All-Share and All-World Ex-UK Total Return Indices reached all-time highs in January 2018, but had reduced slightly by 31 March.

5.3 Funding sensitivities: rules of thumb

Funding levels are sensitive to movements in financial markets, with equity and gilt prices in particular having a major impact upon scheme assets, and gilt yields affecting liability values. In this section we show the effect on scheme funding positions of changes in equity and gilt markets. We have accurately calculated the impact of a change of a 7.5 per cent rise in equity prices and a 0.3 percentage point increase in gilt yields, and interpolated to obtain the rest of the results.

The sensitivities do not take into account the use of derivative instruments to hedge changes in interest rates, inflation, equity levels or life expectancy.

Figure 5.7 | Impact of changes in gilt yields and equity prices on s179 funding positions from a base net funding position of -£70.5 billion as at 31 March 2018

Net funding position (assets less s179 liabilities) (£b)							
Movement in equity prices	Movement in nominal and real gilt yields						
	-0.3pp	-0.2pp	-0.1pp	0.0pp	0.1pp	0.2pp	0.3pp
7.5%	-100.5	-79.7	-58.8	-37.9	-16.7	4.5	25.8
5.0%	-111.3	-90.6	-69.7	-48.7	-27.6	-6.4	15.0
2.5%	-122.2	-101.5	-80.6	-59.6	-38.5	-17.3	4.1
0.0%	-133.1	-112.3	-91.4	**-70.5**	-49.3	-28.1	-6.8
-2.5%	-143.9	-123.2	-102.3	-81.3	-60.2	-39.0	-17.6
-5.0%	-154.8	-134.1	-113.2	-92.2	-71.1	-49.9	-28.5
-7.5%	-165.7	-144.9	-124.1	-103.1	-81.9	-60.7	-39.4

Source: PPF

A 0.1 percentage point rise in both nominal and real gilt yields would have improved the end-March 2018 s179 net funding position by £21.2 billion from -£70.5 billion (bold) to -£49.3 billion (shaded). That's around the same impact as a five per cent increase in equity prices (shaded).

A five per cent increase in equity prices would raise scheme assets by 1.4 per cent (shaded). A 0.1 percentage point decrease in gilt yields would increase scheme assets by 0.7 per cent (shaded).

Figure 5.8 | Impact of changes in gilt yields and equity prices on assets from a base of 100 as at 31 March 2018

Assets relative to a base of 100							
Movement in equity prices	Movement in gilt yields						
	-0.3pp	-0.2pp	-0.1pp	0.0pp	0.1pp	0.2pp	0.3pp
7.5%	104.3	103.5	102.8	102.1	101.4	100.7	100.0
5.0%	103.6	102.8	102.1	101.4	100.7	100.0	99.3
2.5%	102.9	102.1	101.4	100.7	100.0	99.3	98.6
0.0%	102.2	101.4	100.7	**100.0**	99.3	98.6	97.9
-2.5%	101.5	100.8	100.0	99.3	98.6	97.9	97.2
-5.0%	100.8	100.1	99.3	98.6	97.9	97.2	96.5
-7.5%	100.1	99.4	98.6	97.9	97.2	96.5	95.8

Source: PPF

A 0.1 percentage point movement in gilt yields would impact s179 liabilities by around two per cent.

Figure 5.9 | Impact of changes in gilt yields on s179 liabilities as at 31 March 2018

Impact on s179 liabilities						
	Movement in both nominal and real gilt yields					
	-0.3pp	-0.2pp	-0.1pp	0.1pp	0.2pp	0.3pp
Percentage change	5.9%	3.9%	2.0%	-2.0%	-3.9%	-5.9%

Source: PPF

Figure 5.10 | Impact of changes in nominal or real gilt yields on s179 liabilities as at 31 March 2018 (base = £1,643.8 billion)

Impact on s179 liabilities				
	Change in nominal yields		Change in real yields	
	-0.1pp	0.1pp	-0.1pp	0.1pp
£b	1,667.3	1,620.2	1,653.7	1,633.9
Percentage change	1.4%	-1.4%	0.6%	-0.6%

Source: PPF

Note: s179 liabilities are assessed using a combination of various nominal and real gilt yields. Whereas Figure 5.9 shows the impact of universal stresses across both nominal and real yields, Figure 5.10 stresses the nominal and real gilt yields separately.

As at 31 March 2018, the s179 liabilities were over twice as sensitive to changes in nominal yields as to changes in real yields.

Figure 5.11 | Impact of changes in life expectancy assumptions on s179 liabilities as at 31 March 2018 (base = £1,643.8 billion)

	s179 liabilities	**% change from base**
Age rating + 2 years	1,524.6	-7.3%
Age rating - 2 years	1,764.2	7.3%

Source: PPF

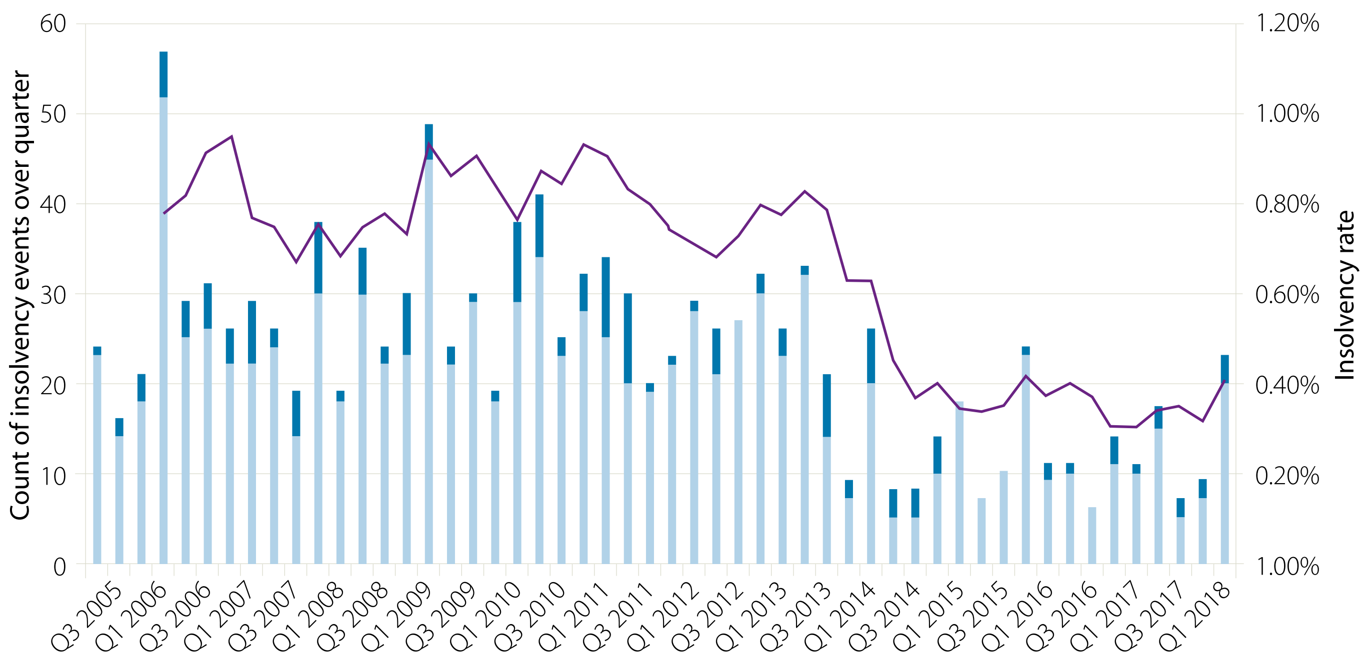
If individuals' life expectancies were to increase to those of someone two years younger, total scheme s179 liabilities would increase by £120.4 billion, or 7.3 per cent.

06 Insolvency risk

6.1 Summary

- The average insolvency rate in the PPF universe fell sharply between the second quarter of 2013 and the fourth quarter of 2014, since when it has been broadly flat.
- UK growth has slowed since the end of 2014. Real GDP growth stood at around 1.2 per cent in Q1 2018, down from 1.8 per cent in Q1 2017.
- The number of whole UK economy insolvencies has increased slightly since last year.
- Schemes with the fewest members tend to have sponsors with higher insolvency probabilities.

Figure 6.1 | PPF universe insolvency rates*



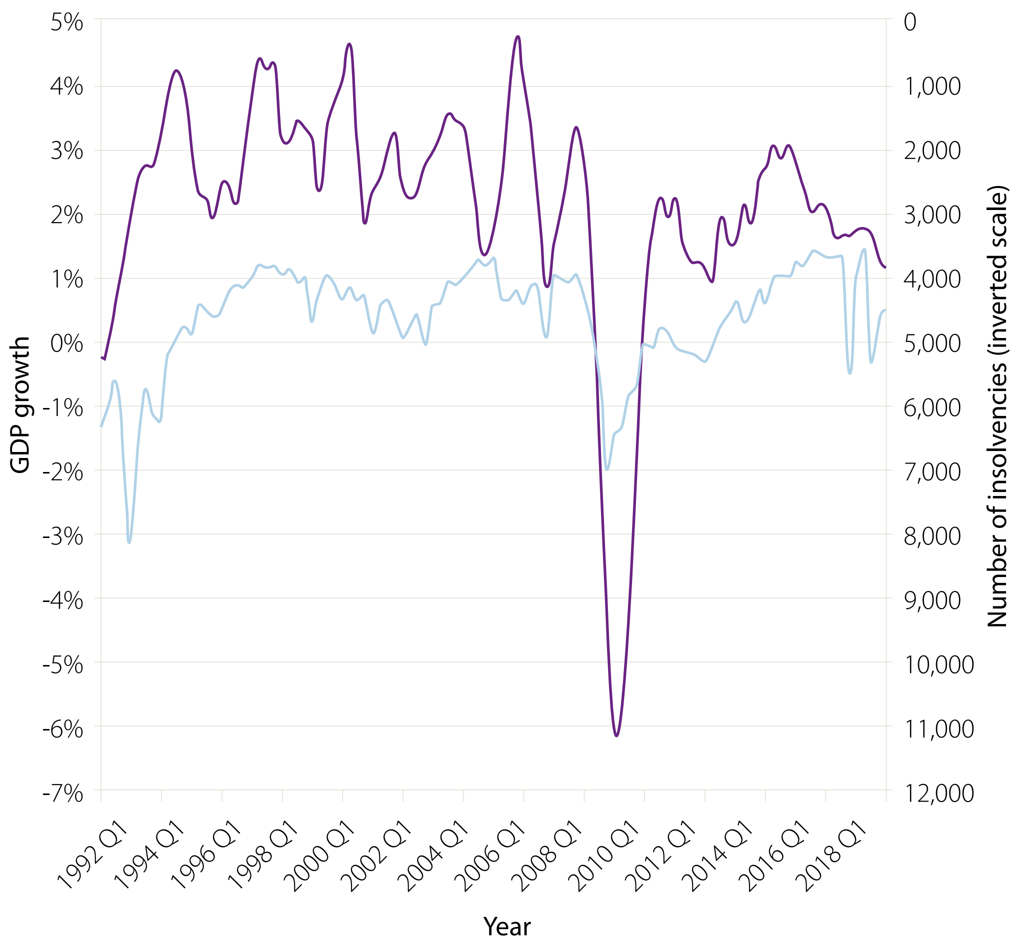
The number of PPF universe insolvencies fell sharply between the second quarter of 2013 and the fourth quarter of 2014 since when they have levelled out.

- Insolvency events in deficit at assessment date (LHS)
- Insolvency events in surplus at assessment date (LHS)
- Four-quarter average insolvency rate (RHS)

Source: PPF

*There are around 14,000 companies in the PPF universe compared with around three million companies in the UK.

Figure 6.2 | UK company insolvencies



- Real GDP growth year-on-year (LHS)
- Number of insolvencies quarterly (RHS)

GDP growth at Q1 2018 stood at around 1.2 per cent, still lower than seen in 2014.

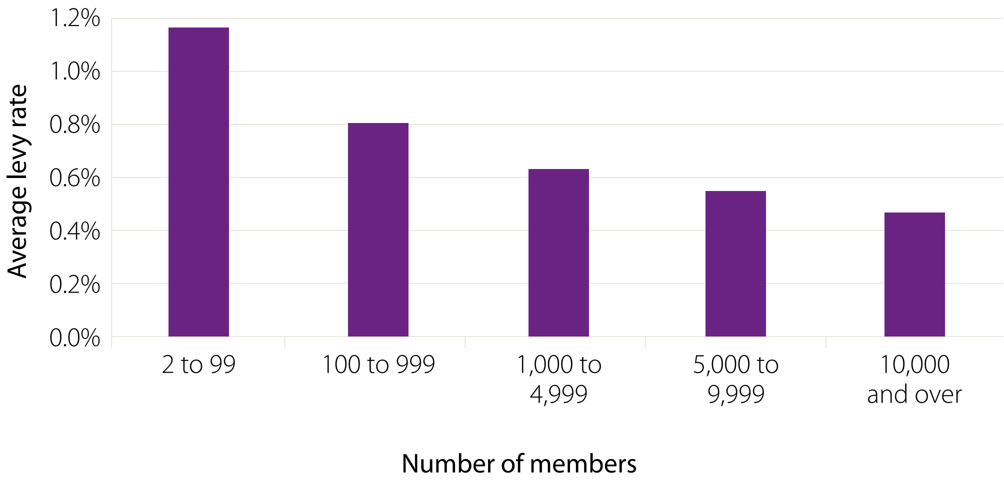
Source: Office for National Statistics (ONS) and the UK Insolvency Service

Note: the spikes in Q4 2016 and Q3 2017 result from large numbers of connected companies all entering insolvency procedures at the same time.

Note: as the ONS and UK Insolvency Service revise their methodologies and receive new data, the figures for previous time periods may be updated.

Schemes with the fewest members tend to have sponsors with higher insolvency probabilities.

Figure 6.3 | Average levy rates of sponsoring companies by scheme membership size, as at 31 March 2018*



Source: PPF

*We have used the schemes' levy rates, as used in calculating the PPF levy, as a proxy for the insolvency probabilities. As such, please note the above chart has been presented differently to previous years' *Purple Books* (except 2017).

07 Asset allocation

7.1 Summary

- Around 99 per cent of schemes' asset allocations in *The Purple Book 2018* dataset were less than two years old as at 31 March 2018.
- The following table looks at some of the movements in asset allocations from the 2017 to the 2018 *Purple Book* datasets:

	Aggregate proportion (weighted) held in *The Purple Book* dataset		
	2018	**2017**	**Commentary**
Bonds	59.0%	55.7%	Proportion held in fixed interest gilts unchanged between *Purple Books* 2017 and 2018 following five years of increases.
of which:			
Government fixed interest	24.1%	24.1%	
Corporate	28.8%	31.4%	
Index-linked	47.1%	44.5%	
Equities	27.0%	29.0%	Continues long-term trend of moving out of equity, and into bonds.
of which:			
UK-quoted	18.6%	20.5%	
Overseas	69.4%	69.0%	
Unquoted/ private	12.0%	10.5%	
Other	14.0%	15.3%	While it appears that the proportion of assets held in securities other than bonds and equities has declined, this reflected a larger negative proportion held in cash (-2.5% compared with -0.9%), probably related to swap and gilt repurchase arrangements.

- Within equities, smaller schemes tend to hold higher proportions in UK equities with smaller proportions in overseas and unquoted/private equities.
- Within bonds, smaller schemes tend to have higher proportions in government and corporate fixed interest bonds than in index-linked bonds.
- The best funded schemes tend to have the greatest proportion of their assets invested in bonds and a smaller proportion invested in equities.
- As scheme maturity increases, the proportion of bonds rises and the proportions of equities and hedge funds fall.

7.2 Asset data[7]

Figure 7.1 | Distribution of schemes by asset allocation date*

Asset allocation year	Number of schemes	Percentage of *The Purple Book 2018* dataset
2006 -2012	8	0.1%
2013	5	0.1%
2014	13	0.2%
2015	37	0.7%
2016	1,820	33.4%
2017	3,545	65.0%
2018	22	0.4%
Total	**5,450**	**100%**

Around 99 per cent of schemes provided an asset allocation less than two years old.

Source: PPF

Note: the percentage column does not sum to 100 per cent due to rounding.

*There can be a significant gap between the date of the scheme return and the date at which the asset allocation was taken. This means that the date at which asset allocation data is provided differs from scheme to scheme.

[7] Asset allocations submitted by schemes are not adjusted for market movements. Most of this chapter uses weighted average asset allocations. For example, the weighted average share of equities is the total amount of equities across all schemes divided by the total amount of assets across all schemes. The simple average takes the arithmetic average of each scheme's proportion of its assets held in equities.

Figure 7.2 | Weighted average asset allocation in total assets

	Asset class							
				Breakdown of other investments				
Year/ *The Purple Book* dataset	**Equities**	**Bonds**	**Other investments**	***Property***	***Cash and deposits***	***Insurance policies***	***Hedge funds***	***Miscellaneous****
2006	61.1%	28.3%	10.6%	4.3%	2.3%	0.9%	n/a	3.1%
2007	59.5%	29.6%	10.9%	5.2%	2.3%	0.8%	n/a	2.5%
2008	53.6%	32.9%	13.5%	5.6%	3.0%	1.1%	n/a	3.8%
2009	46.4%	37.1%	16.5%	5.2%	3.9%	1.4%	1.5%	4.5%
2010	42.0%	40.4%	17.6%	4.6%	3.9%	1.4%	2.2%	5.4%
2011	41.1%	40.1%	18.8%	4.4%	4.1%	1.6%	2.4%	6.3%
2012	38.5%	43.2%	18.3%	4.9%	5.1%	0.2%	4.5%	3.6%
2013	35.1%	44.8%	20.1%	4.7%	6.7%	0.1%	5.2%	3.5%
2014	35.0%	44.1%	20.9%	4.6%	6.1%	0.1%	5.8%	4.3%
2015	33.0%	47.7%	19.3%	4.9%	3.5%	0.1%	6.1%	4.7%
2016	30.3%	51.3%	18.4%	4.8%	3.0%	0.1%	6.6%	3.8%
2017	29.0%	55.7%	15.3%	5.3%	-0.9%	0.1%	6.7%	4.1%
2018	27.0%	59.0%	14.0%	4.8%	-2.5%	0.1%	7.0%	4.6%

Source: PPF

* Other alternative investments excluding hedge funds. 3.4 per cent of the total 2018 figure relates to annuity policies held in the schemes' names, sometimes referred to as 'buy-ins'.

The weighted average proportion of assets held in cash and deposits being negative represents a number of large schemes with significant negative cash holdings which are likely to be related to investments such as swaps and repurchase agreements.

Note: figures may not sum to 100 per cent or the 'other investments' total due to rounding.

In *The Purple Book 2018* dataset, the proportion invested in bonds rose while the proportion in equities fell, continuing the long-term trend.

Figure 7.3 | Asset allocation: simple averages

Year/ *The Purple Book* dataset	Asset class							
				Breakdown of other investments				
	Equities	**Bonds**	**Other investments**	***Property***	***Cash and deposits***	***Insurance policies***	***Hedge funds***	***Miscellaneous****
2006	52.6%	22.6%	24.8%	2.1%	3.9%	14.9%	n/a	3.6%
2007	53.5%	24.0%	22.5%	2.5%	3.7%	13.7%	n/a	2.6%
2008	50.2%	26.5%	23.3%	2.9%	4.4%	13.0%	n/a	2.9%
2009	46.6%	29.2%	24.2%	2.8%	5.6%	12.4%	0.7%	2.6%
2010	43.1%	32.6%	24.3%	2.6%	5.7%	12.3%	0.9%	2.8%
2011	43.7%	32.6%	23.7%	2.7%	4.9%	11.8%	1.0%	3.3%
2012	43.7%	36.1%	20.2%	3.5%	5.5%	4.4%	3.7%	3.2%
2013	40.6%	39.1%	20.3%	3.6%	6.2%	2.0%	5.0%	3.5%
2014	39.4%	39.0%	21.6%	3.5%	6.4%	1.8%	6.2%	3.9%
2015	38.8%	39.4%	21.8%	3.6%	5.7%	1.7%	7.3%	3.7%
2016	36.8%	41.1%	22.1%	3.7%	5.4%	1.2%	7.9%	3.9%
2017	34.5%	41.4%	24.1%	3.7%	3.6%	0.7%	7.9%	8.1%
2018	32.4%	43.1%	24.5%	3.3%	1.8%	0.6%	8.5%	10.3%

Source: PPF

* Other alternative investments excluding hedge funds. 8.9 per cent of the total 2018 figure relates to annuity policies held in the schemes' names, sometimes referred to as 'buy-ins'.

A comparison of simple and weighted averages in 2018 shows there is a greater weighted allocation to bonds and smaller allocations to equities and other investments.

Figure 7.4 | Bond splits

Year/ *The Purple Book* dataset	Bonds					
	Weighted average			Simple average		
	Government fixed interest	**Corporate fixed interest**	**Index-linked**	**Government fixed interest**	**Corporate fixed interest**	**Index-linked**
2008	33.2%	32.6%	33.9%	47.2%	33.0%	19.8%
2009	29.0%	38.3%	32.6%	45.6%	37.3%	17.1%
2010	24.6%	42.2%	33.1%	37.3%	43.0%	19.8%
2011	19.6%	44.3%	36.1%	31.2%	47.1%	21.7%
2012	17.7%	44.8%	37.5%	28.2%	49.4%	22.4%
2013	18.5%	40.6%	40.9%	27.0%	49.6%	23.4%
2014	18.6%	40.3%	41.1%	23.8%	51.9%	24.4%
2015	20.3%	37.7%	42.0%	23.8%	51.2%	25.0%
2016	21.9%	33.7%	44.4%	24.4%	49.0%	26.6%
2017	24.1%	31.4%	44.5%	25.9%	46.8%	27.3%
2018	24.1%	28.8%	47.1%	27.2%	42.1%	30.8%

Source: PPF

Note: the rows may not sum to 100 per cent due to rounding.

Within bonds, the proportion invested in corporate bonds declined in 2018 for the sixth consecutive year, while the proportion invested in index-linked bonds rose.

Within equities, the proportions invested in overseas and in unquoted/private equities continued to rise, while the proportion invested in UK equities continued to fall.

Figure 7.5 | Equity splits

Year/ *The Purple Book* dataset	Equities					
	Weighted average			Simple average		
	UK quoted	Overseas quoted	Unquoted/ Private	UK quoted	Overseas quoted	Unquoted/ Private
2008	48.0%	51.6%	n/a	60.4%	39.6%	n/a
2009	44.2%	53.8%	1.9%	57.6%	41.7%	0.7%
2010	40.1%	55.3%	4.4%	55.3%	43.7%	1.0%
2011	38.0%	57.2%	4.8%	52.7%	46.1%	1.2%
2012	33.9%	60.0%	6.1%	49.9%	48.5%	1.7%
2013	31.0%	61.3%	7.7%	47.5%	50.3%	2.2%
2014	28.9%	62.4%	8.7%	44.9%	52.7%	2.4%
2015	25.6%	65.4%	9.0%	42.2%	55.3%	2.5%
2016	22.4%	68.6%	9.0%	38.8%	58.6%	2.6%
2017	20.5%	69.0%	10.5%	36.3%	61.0%	2.7%
2018	18.6%	69.4%	12.0%*	32.1%	65.0%	3.0%*

Source: PPF

*Most of the unquoted/private equity investment is carried out by the largest schemes – see figure 7.7.

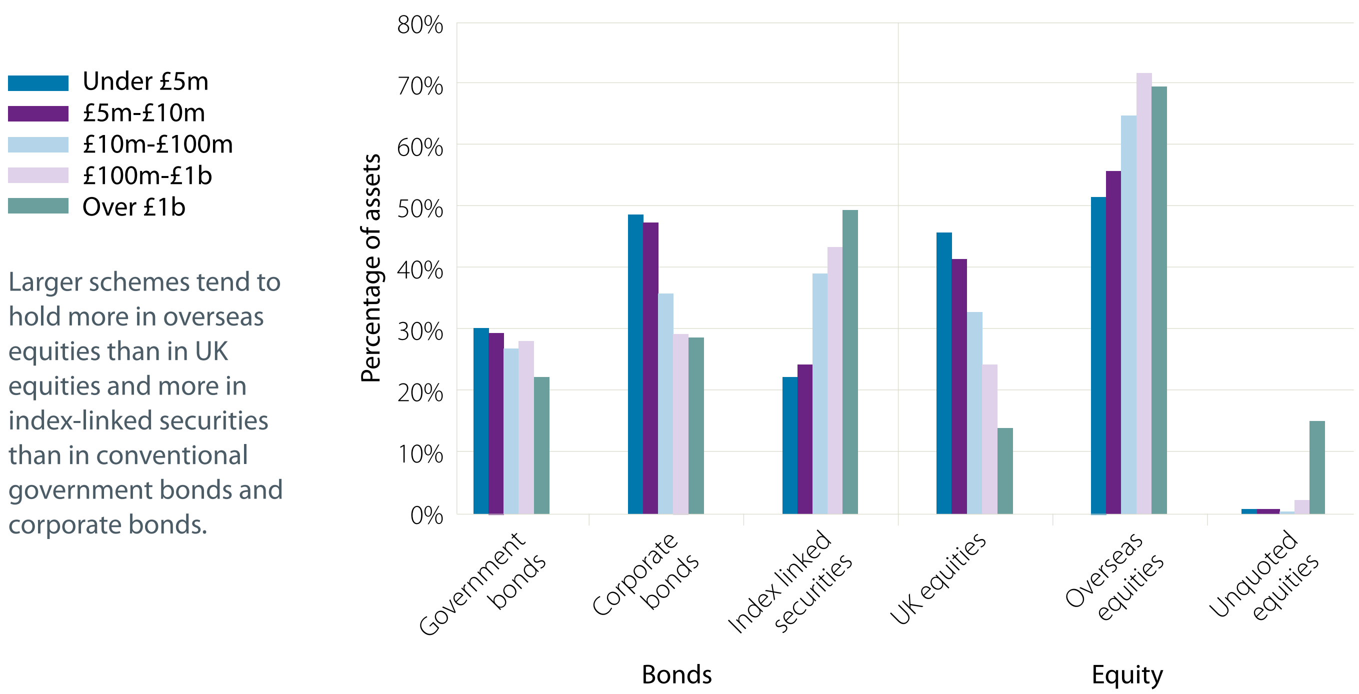
Figure 7.6 | Weighted average asset allocation of schemes by asset size

Source: PPF

*Other alternative investments excluding hedge funds.

The proportion of assets held in bonds tends to increase with scheme asset size, while equities display the opposite relationship.

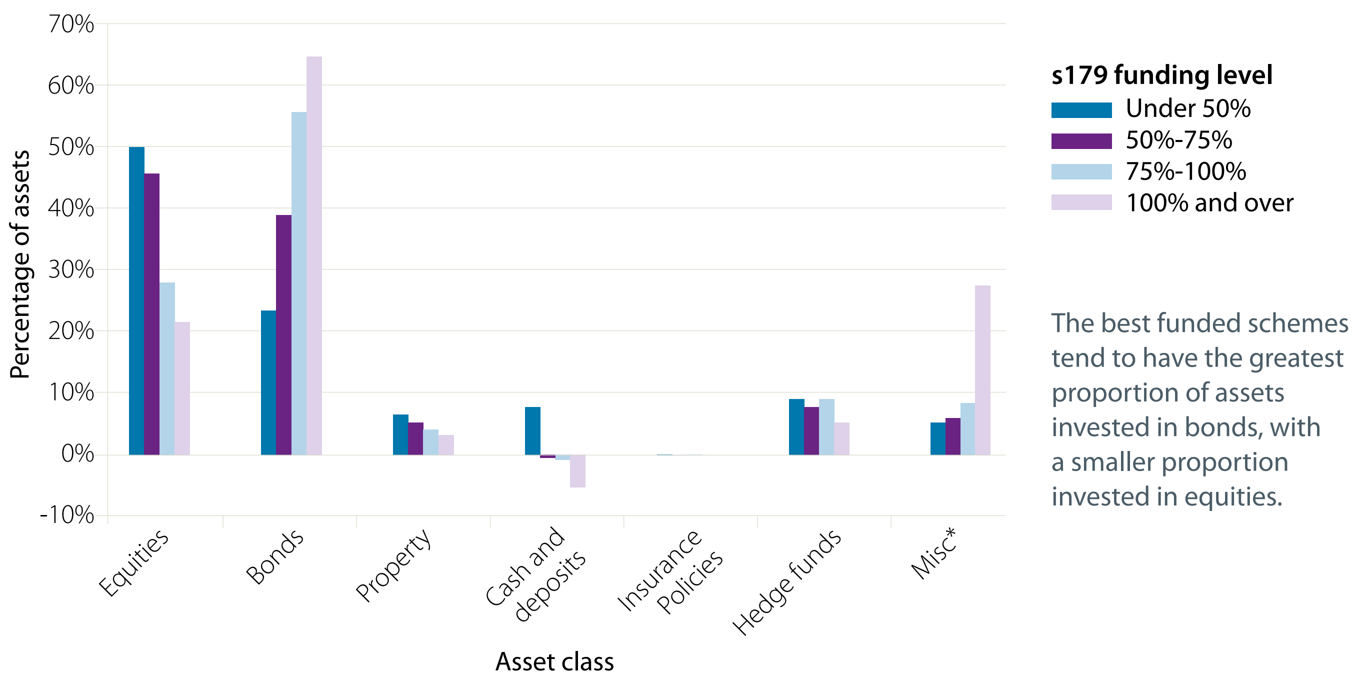
Figure 7.7 | Weighted averages of equity and bond holdings split by asset size



Source: PPF

Larger schemes tend to hold more in overseas equities than in UK equities and more in index-linked securities than in conventional government bonds and corporate bonds.

Figure 7.8 | Weighted average asset allocation by s179 funding level



Source: PPF

*Other alternative investments, excluding hedge funds.

The best funded schemes tend to have the greatest proportion of assets invested in bonds, with a smaller proportion invested in equities.

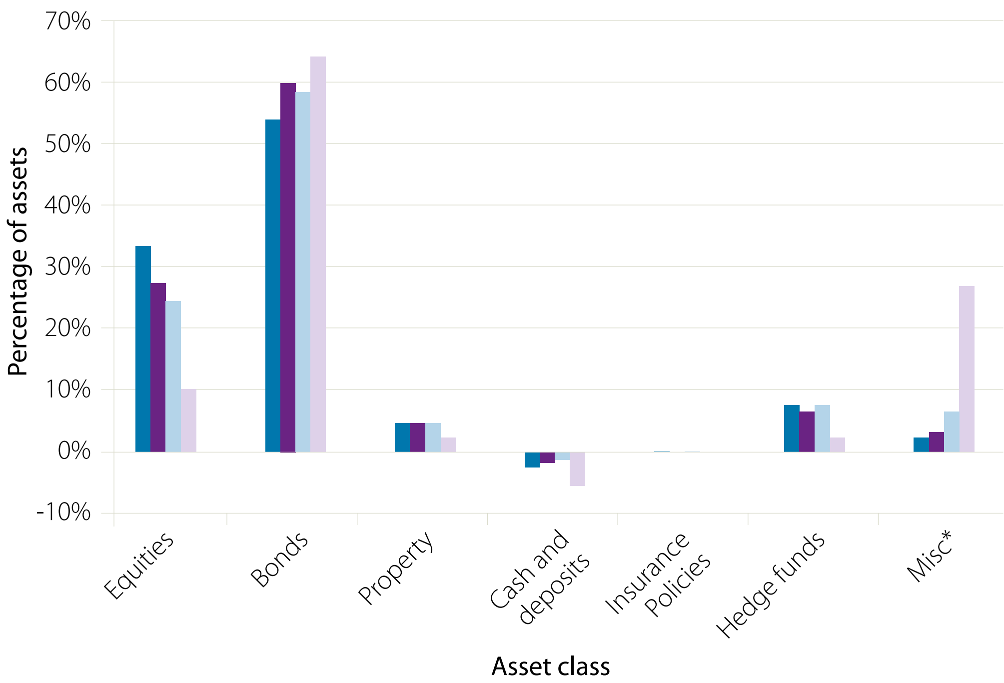
Asset allocation

Proportion of liabilities relating to current pensioners

- 0%-25%
- 25%-50%
- 50%-75%
- 75%-100%

As scheme maturity increases, the proportion of bonds rises and the proportions of equities and hedge funds fall.

Figure 7.9 | Weighted average asset allocation of schemes by scheme maturity



Source: PPF

*Other alternative investments, excluding hedge funds.

Note: the heavy concentration in 'misc' for mature schemes is explained by one large scheme with a heavy concentration in annuity policies.

08 PPF risk developments

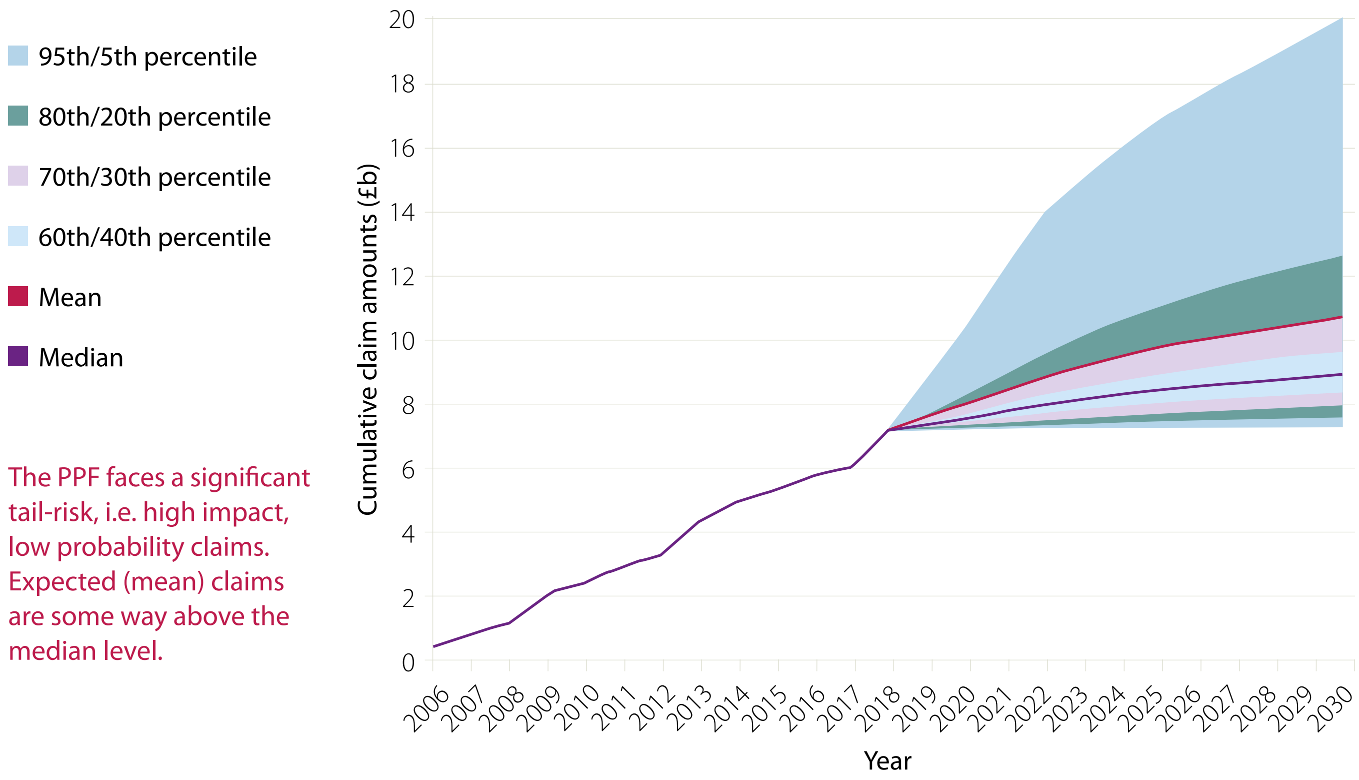
8.1 Summary

- We published our long-term funding strategy in August 2010[8] and our most recent annual update was in July 2018[9]. The strategy established a long-term funding objective and a framework for monitoring progress towards this target.
- Our long-term funding objective is to be self-sufficient by our target funding horizon, currently set to be the year 2030. Self-sufficiency means that the PPF is fully-funded with minimal exposure to market, inflation and interest rate risk, and is protected against a number of risks beyond the funding horizon (in 9 out of 10 modelled scenarios). Currently we consider that this protection could be afforded by a funding reserve equivalent to 10 per cent of PPF liabilities.
- We use the 'probability of success' and 'downside risk'[10] statistics to monitor progress against our funding objective. As at 31 March 2018, our model results showed a 91 per cent probability of meeting our funding objective, down two percentage points from 31 March 2017, while the 'downside risk' remained unchanged at £2 billion.
- The decrease in the reported probability of success over the year was caused by a deterioration in the economic outlook in the projections, offset to an extent by improvements in the funding level (as measured in the PPF 7800 Index) and the insolvency outlook of schemes in the universe.
- Claims on the PPF in the year to 31 March 2018 neared £1.2 billion (as measured for the purpose of our Annual Report and Accounts), the highest in any year since the PPF's inception.

[8] For more information see our website.
[9] For more information see our website.
[10] See section 8.3 for definitions of these terms.

8.2 Long-term risk

Figure 8.1 | Historical amount of claims made on the PPF and projected deficits of schemes entering the PPF from 31 March 2018*



Source: PPF

*As projected in the PPF's internal model. Claims on the PPF are the pension deficits that are brought into the PPF when scheme sponsors suffer insolvency. The fan chart depicts the probability that the cumulative deficits of schemes entering the PPF from 31 March 2018 will be within certain boundaries.

The PPF faces a significant tail-risk, i.e. high impact, low probability claims. Expected (mean) claims are some way above the median level.

8.3 The PPF's long-term funding strategy

- We published our long-term funding strategy in August 2010 and our most recent annual update was in July 2018. The strategy established a long-term funding objective and a framework for monitoring progress towards this target.
- Our long-term funding objective is to be self-sufficient by our target funding horizon, currently set to be the year 2030. Self-sufficiency means that the PPF is fully-funded with minimal exposure to market, inflation and interest rate risk and is protected against risks beyond the funding horizon such as future claims, members living longer than expected, the PPF's RPI-linked assets not exactly tracking its CPI-linked liabilities, and operational risk. The assumption is that from 2030 the PPF levy will be set at a level to match future expected claims.
- Exposure to market, inflation and interest rate risk can be reduced using conventional hedging arrangements and investment in low-risk securities. Analysis of output from our internal model described below suggests that a funding reserve equivalent to 10 per cent of PPF liabilities at the current funding horizon of 2030 would be enough to cover unexpected claims, life expectancy, operational and matching risk (over the lifetime of the PPF) in 9 out of 10 scenarios.
- We use two key measures to monitor progress against its funding objective – the 'probability of success' and the 'downside risk'.

Probability of success

The chances of being self-sufficient at the funding horizon if the PPF continues on its current course to self-sufficiency with no change to our investment strategy or to the PPF levy formula.

Downside risk

A measure of how poorly funded the PPF might become on its path to self-sufficiency. We calculate such that in 10 per cent of modelled scenarios the PPF's deficit will reach at least that level at some point before it reaches its funding horizon.

- To measure these statistics, we have developed an internal model that projects the level of PPF assets and liabilities in future years. It generates an extensive range of claims from eligible schemes, asset returns, insolvency and longevity scenarios and then projects a range of PPF balance sheet outcomes. The process of using a large number of modelled scenarios to create a distribution of outcomes is called stochastic analysis. It is widely used in the financial services industry and has a primary advantage over deterministic or 'single point' forecasts because having a distribution of outcomes allows us to assess not just our best estimate of the future, but also the likelihood of specific variations from that outcome.
- As with any financial model, it is important to exercise an appropriate degree of caution when analysing output. To help assess the level of model and parameter risk, we carry out multiple runs to test how sensitive the output is to changes in the key assumptions – see Figure 8.2.
- Figure 8.3 shows the history of claims made on the PPF (measured for the purpose of the Annual Report and Accounts at the relevant time), as well as expected levy collections (as published in the Levy Determination) since its inception.

The probability of the PPF meeting its funding objective was 91 per cent as at 31 March 2018.

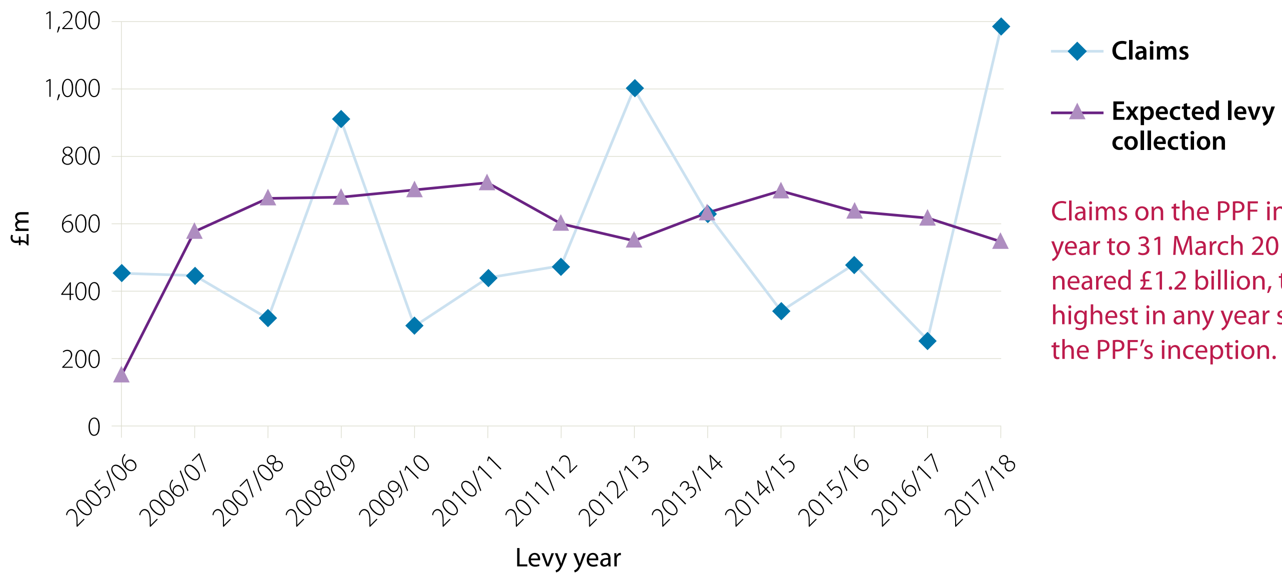
Figure 8.2 | Sensitivities of the probability of the PPF meeting its funding objective, and downside risk, to key assumptions, as at 31 March 2018

Scenario	Change in probability of meeting funding objective (percentage points)	Downside risk (£b)
Base case	91%	2
Scheme s179 funding levels reduce by 10 percentage points as a result of a decrease in asset values	-5	+4
Recovery plans five years longer	-1	+1
Technical Provision levels targeted by schemes reduced by 10% (relative to s179 basis) leading to lower Deficit-Reduction Contribution amounts	-2	+1
Schemes close to new benefit accruals immediately	<1 improvement	<1 improvement
Sponsor credit rating falls by one rating notch	-2	+2
Simulated large claim (immediate claim with liabilities of £10b and assets of £5b)	-9	+6
Initial PPF funding reduced by 10 percentage points as a result of decrease in asset values	-6	+4
Size of the PPF increases by 20% (assets and liabilities)	<1 improvement	<1 improvement
PPF levies lower by 10%	<1 worsening	<1 worsening
Reduction in asset returns of 1.0 percentage point pa (excluding cash and government bonds)	-6	+2
CPI is 50 basis points pa lower than best-estimate pa (difference between RPI and CPI widens from 1.0% to 1.5% pa)	+3	-1
CPI is 50 basis points pa higher than best-estimate (difference between RPI and CPI narrows from 1.0% to 0.5% pa)	-5	+2
Continued low interest rate*	-5	+3
Life expectancy sensitivity (probability of death in any single year reduced by 20%)	-5	+5

Source: PPF

*See *Funding Strategy Update*, July 2018 for more detail of how this was modelled.

Figure 8.3 | History of claims made on the PPF and published levy estimate



Source: PPF

Claims on the PPF in the year to 31 March 2018 neared £1.2 billion, the highest in any year since the PPF's inception.

09 PPF levy 2017/18

9.1 Summary

- Since 2006/7, the PPF has collected a total of £6.8 billion through levies determined mainly by the risk schemes pose to the PPF.
- Some of the key statistics from this chapter are summarised in the following table:

	2017/18*	2016/17*
Total levy since 2006/7	£6.8b	£6.3b
Total levy in year[11]	£541m	£563m
Proportion of total scheme assets	0.04%	0.05%
Number of schemes which contributed to this	5,639	5,773
Amount and proportion of total levy contributed by the top	£226m	£237m
100 levy payers (by size of levy)	42%	42%
Proportion of schemes which paid no risk-based levy	18%	17%
Number of schemes with a capped risk-based levy**	147	187
Proportion of total number of schemes	3%	3%
PPF levy band whose schemes made the largest contribution in the year	1	1
Levy contribution made by these schemes	£187m	£192m
Proportion of total levy contribution	35%	34%
Proportion of total liabilities accounted for by schemes in this category	56%	58%
Proportion of PPF levy that came from schemes sponsored by employers categorised as Large/Complex or Group with a turnover of £50m+ for Experian scorecard purposes	Over 75%	Over 75%

* year from 1 April to 31 March
** i.e. those where the levy would otherwise have been larger than 0.75 per cent of smoothed liabilities

[11] Whereas this is the total amount of levy invoiced, the figure disclosed in the PPF's Annual Report and Accounts (ARA) is the amount collected, which in places includes levies collected in the year to 31 March 2018 in respect of the previous year. The ARA also makes an allowance for credit notes, accrued invoices, and bad debt provisions, which *The Purple Book* does not.

- Assets and liabilities, and therefore funding levels, in this chapter are on a smoothed, stressed basis unless otherwise stated and exclude Deficit-Reduction Contributions (DRCs). For more information on these and other terms and definitions used in this chapter, see the 17/18 Levy Determination, and its associated appendices, available on our website.

9.2 Total levy by year

In this section we compare total levy by levy year, starting from levy year 2012/13 when the New Levy Framework was introduced, up to 2017/18. We look at the distribution across schemes broken down by size and levy band, considering the risk-based levy and scheme-based levy separately.

The total levy in 2017/18 is the lowest since 2012/13, continuing the general downwards trend.

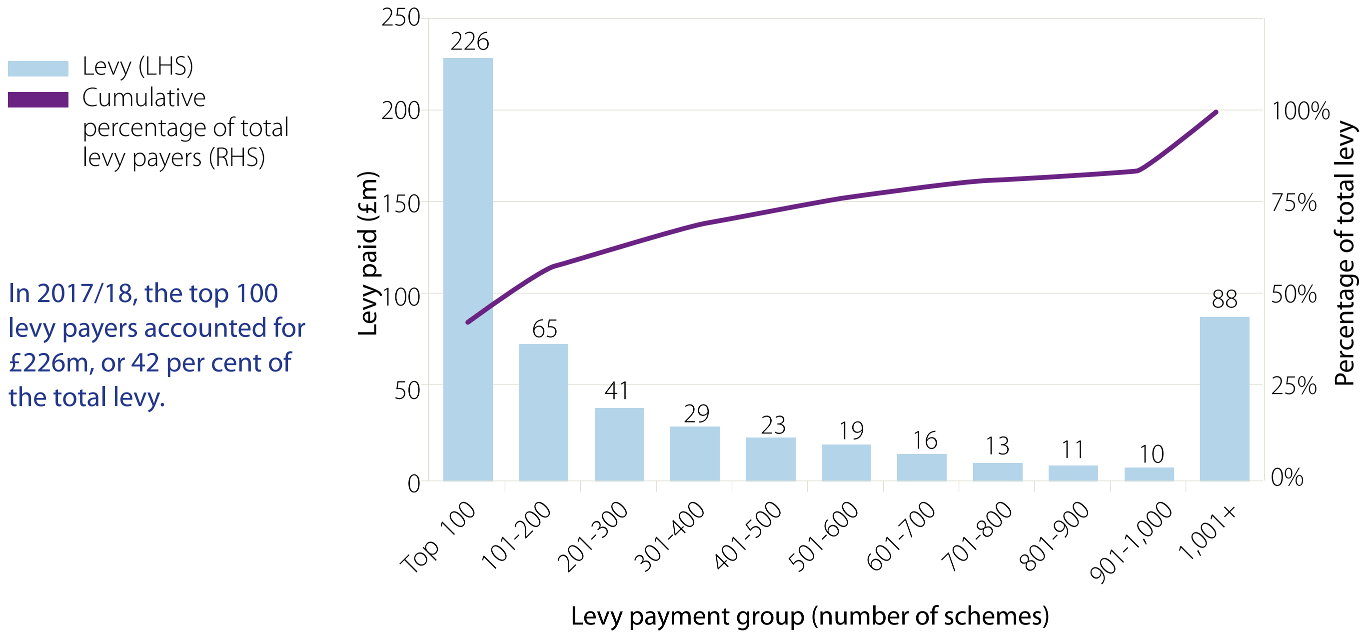
Figure 9.1 | Total levy

Levy year	Total levy (£m)[a]	Levy as a percentage of assets[b]	Number of capped schemes[c]
2012/13	648	0.08%	427
2013/14	577	0.06%	302
2014/15	579	0.06%	274
2015/16	560	0.05%	211
2016/17	563	0.05%	187
2017/18	541	0.04%	147

Source: PPF

Notes:
a) The figures quoted in this chapter are based on the total levy for the dataset of 5,639 schemes in 2017/18, or from prior years' *Purple Books*.
b) Total levy as a percentage of levy-paying schemes' total assets.
c) Refers to schemes to which the risk-based levy cap (0.75 per cent of smoothed liabilities for levy year 2017/18) applied.

Figure 9.2 | Distribution of levy by largest levy payers in 2017/18



In 2017/18, the top 100 levy payers accounted for £226m, or 42 per cent of the total levy.

Source: PPF

Note: the 1,001+ category accounts for a relatively large percentage of the total levy as it contains just over 4,600 schemes.

Figure 9.3 | Schemes with no risk-based levy by levy year

Levy year	Number of schemes	Percentage of total schemes	s179 liabilities[12] (£b)	s179 liabilities as percentage of total
2012/13	1,191	19%	199	19%
2013/14	1,056	17%	171	15%
2014/15	1,113	18%	206	17%
2015/16	985	17%	195	14%
2016/17	961	17%	239	16%
2017/18	1,011	18%	405	25%

Source: PPF

The percentage of schemes with no risk-based levy has remained at a similar level since the introduction of the New Levy Framework in 2012/13.

[12] Liabilities are stressed and smoothed.

Figure 9.4 | Number of schemes with capped risk-based levies by levy band

Levy band[13]	Levy rate[14]	Total number of schemes	Number of capped schemes[15]	Percentage of schemes in levy band which are capped
1	0.17%	1,482	0	0.0%
2	0.23%	666	0	0.0%
3	0.30%	705	0	0.0%
4	0.40%	562	0	0.0%
5	0.53%	507	0	0.0%
6	0.81%	580	0	0.0%
7	1.26%	546	3	0.5%
8	1.76%	219	16	7.3%
9	2.39%	206	59	28.6%
10	3.83%	166	69	41.6%
Total		**5,639**	**147**	**2.6%**

The proportion of schemes with a restricted risk-based levy (so as not to exceed the risk-based levy cap) fell from 3.2 per cent in 2016/17 to 2.6 per cent in 2017/18.

Source: PPF

Note: schemes with multiple employers have had their insolvency probability calculated as an average of the corresponding employers, mapped back to the nearest levy band.

Figure 9.5 | Number of schemes with capped risk-based levies by funding level (on a stressed and smoothed basis)

Funding level	Number of capped schemes	Percentage of schemes in funding band which are capped	Total number of schemes
Less than 50%	86	11.3%	760
50%-75%	61	2.5%	2,448
Greater than 75%	0	0.0%	2,431
Total	**147**	**2.6%**	**5,639**

No scheme over 75 per cent funded had its 2017/18 risk-based levy capped.

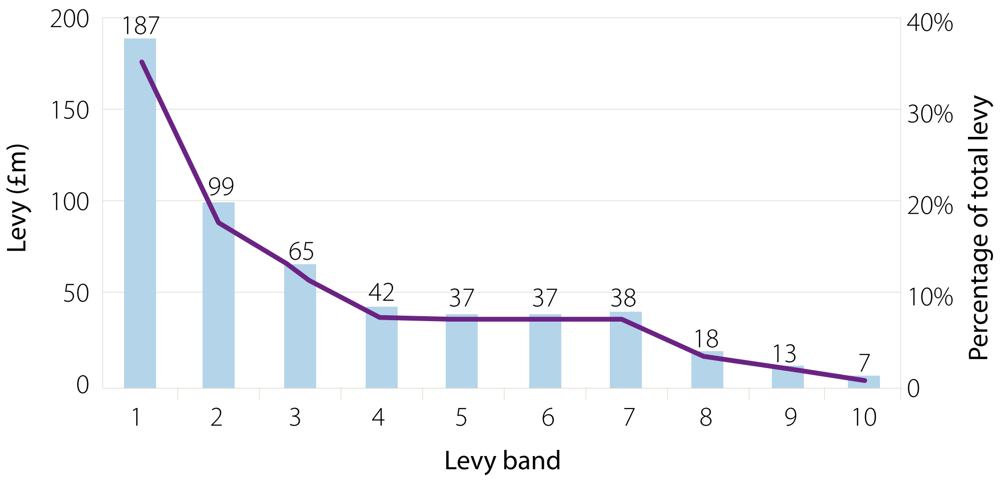
Source: PPF

[13] For full details of the levy bands, or
[14] for the definition of scheme and risk-based levy, and details of the derivation of levy bands, or
[15] for the definition of capped schemes, please see the 17/18 Levy Determination.

Figure 9.6 | Levy distribution by levy band

Levy paid (LHS)
Percentage of total levy (RHS)

Schemes in levy band 1 made the largest contribution to the total levy, paying 35 per cent.

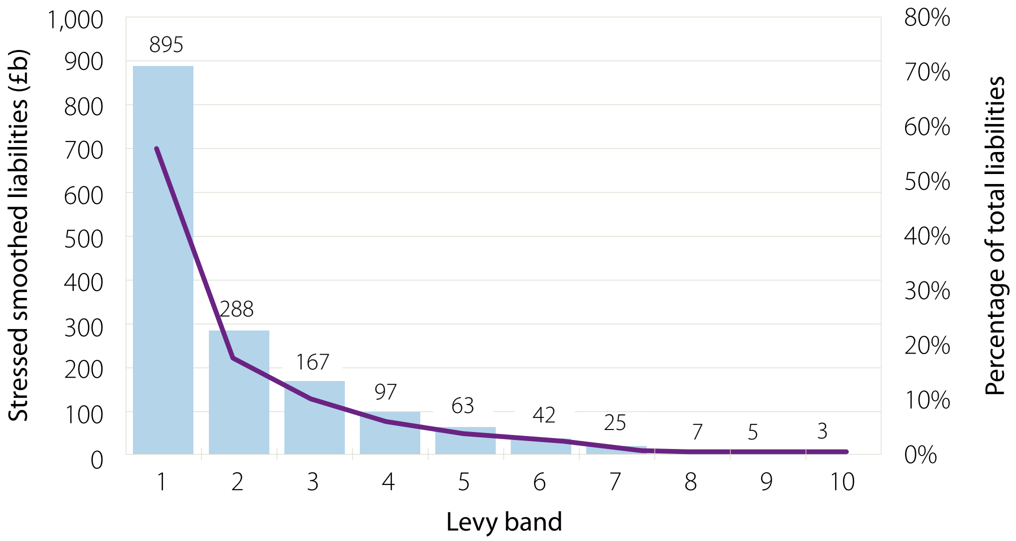


Source: PPF

Figure 9.7 | Liabilities by levy band

Stressed smoothed liabilities (LHS)
Percentage of total stressed smoothed liabilities (RHS)

Schemes in levy band 1 account for 56 per cent of the total liabilities.

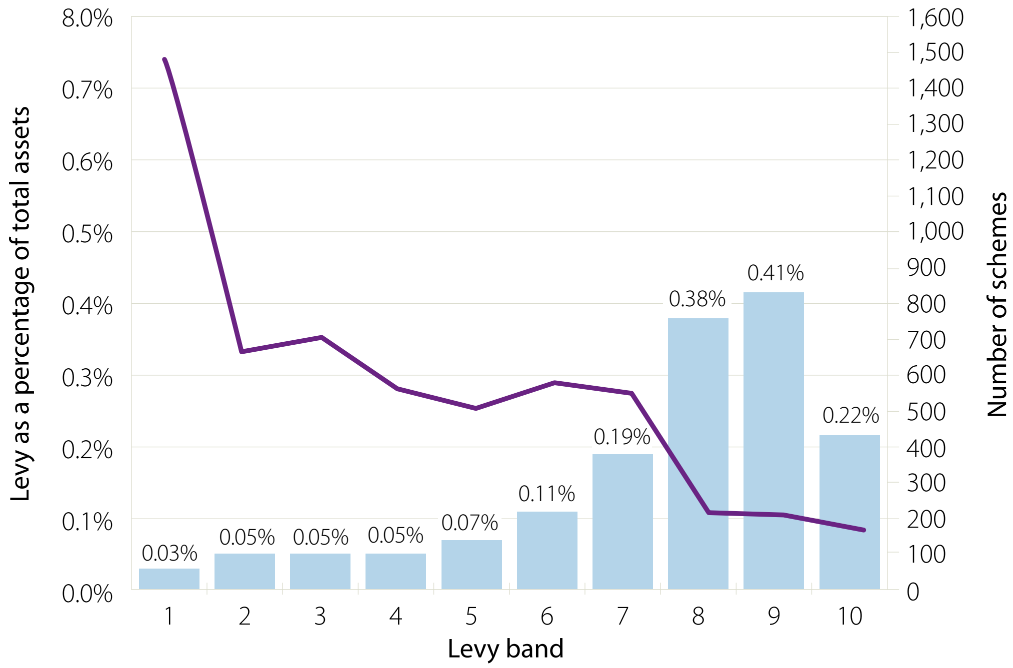


Source: PPF

Figure 9.8 | Levy as a proportion of assets by levy band

Levy as % of assets (LHS)
Number of schemes (RHS)

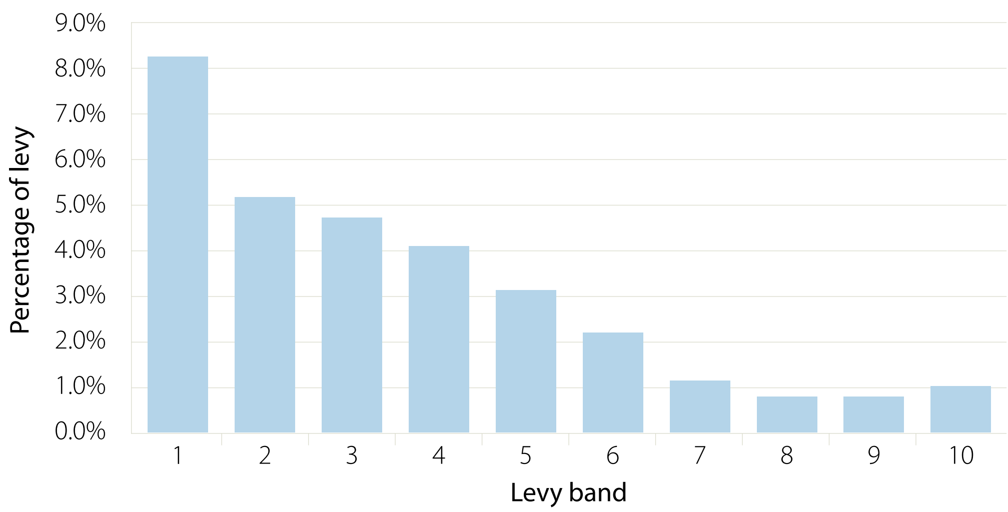
The PPF levy is overall very small compared with the value of total assets. The average proportion was 0.04% per cent in 2017/18.



Source: PPF

Figure 9.9 | Percentage of total levy that is scheme-based[16] by levy band

In general, the proportion of total levy that is scheme-based falls as the band increases.



Source: PPF

The proportion of total levy made up by the scheme-based levy increases as the funding level increases.

Figure 9.10 | Percentage of total levy that is scheme-based by funding level (on a stressed and smoothed basis)

Funding level	**Less than 50%**	**50%-75%**	**75%-100%**	**Over 100%**
Percentage of levy that is scheme-based	1.7%	3.7%	11.9%	96.3%

Source: PPF

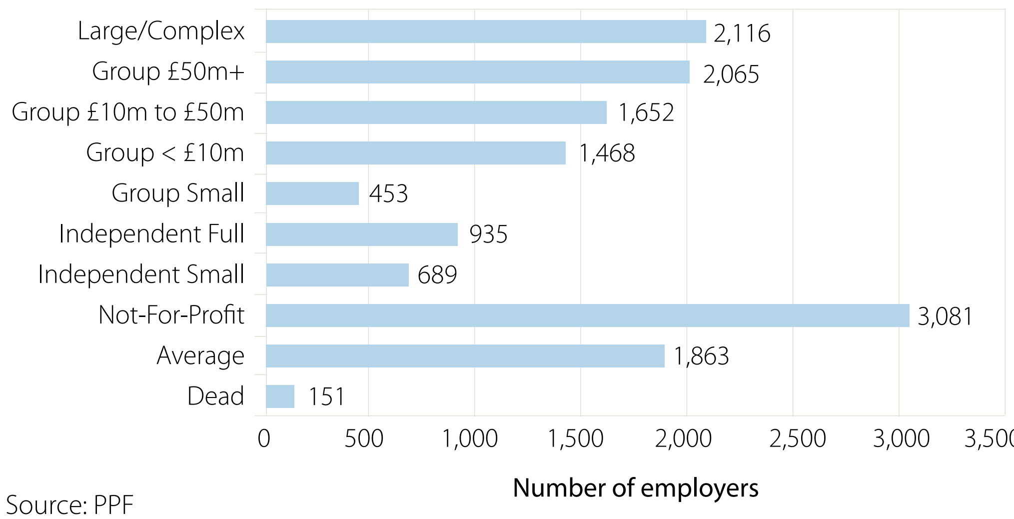
9.3 Experian scorecards

For the 2017/18 levy year, we used Experian for assessing insolvency risk of schemes in the universe. Experian categorised sponsoring employers in one of eight main 'scorecards' (or one of a further two in some circumstances), according to certain criteria[17].

The charts in this section show how many sponsoring employers in the PPF universe are assigned to each scorecard, and how much of the total 2017/18 PPF levy was collected in respect of schemes sponsored by the employers in these categories[18].

Not-For-Profit organisations make up the greatest number of sponsoring employers in the PPF universe.

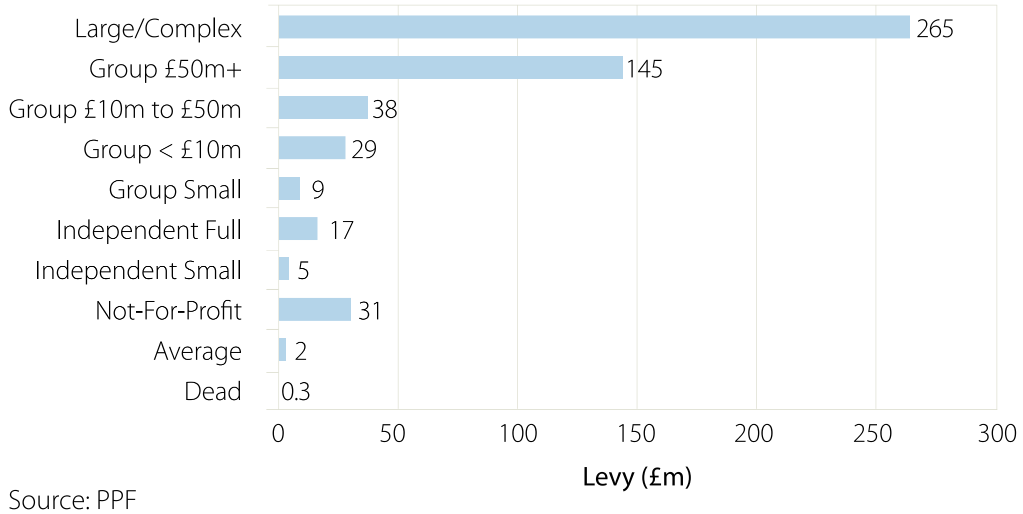
Figure 9.11 | Number of sponsoring companies in each Experian scorecard



Source: PPF

[16] For the definition of scheme-based levy, please visit our website.
[17] For more information on the scorecard criteria, see the 17/18 Levy Determination on our website, as well as Experian's document 'Developing a specific measure of insolvency risk for the PPF'.
[18] For multi-employer schemes (with employers on different scorecards), the levy was split proportionately by membership numbers.

Figure 9.12 | Levy invoiced in respect of schemes with sponsoring employers in each Experian scorecard



Source: PPF

Over three quarters of the levies paid in the 2017/18 levy year came from schemes sponsored by employers categorised as Large/Complex or Group £50 million+.

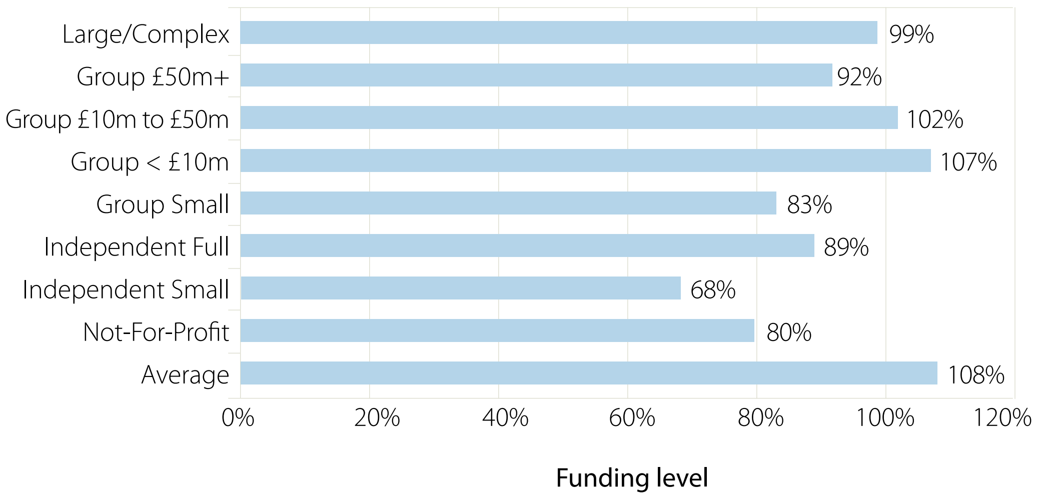
Figure 9.13 | Number of schemes with sponsoring employers in each Experian scorecard

Source: PPF

46 per cent of schemes had sponsors categorised as Large/Complex or Group £50 million+.

Schemes with sponsoring employers categorised as Independent Small or Not-For-Profit have the lowest average funding levels.

Figure 9.14 | Average funding level (unstressed and unsmoothed) of schemes with sponsoring employers in each Experian scorecard



Source: PPF

10 Schemes in assessment

10.1 Summary

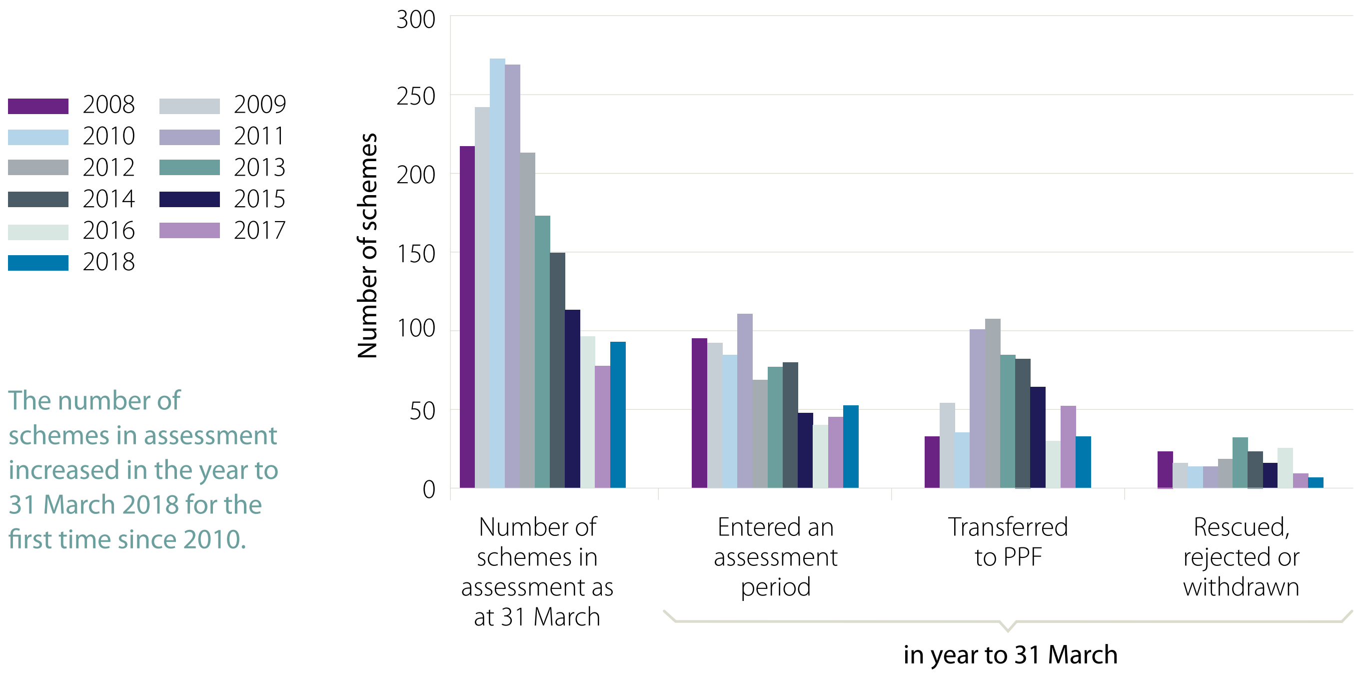
- Before transferring into the PPF, all schemes go through an assessment period to determine their ability to pay PPF levels of compensation.
- In this chapter, we consider the schemes[19] that were in a PPF assessment period as at 31 March 2018. The changes over the year since 31 March 2017 reflect new schemes entering and remaining in assessment, schemes transferring into the PPF and schemes being rescued, rejected or withdrawn.
- The following table sets out some of the statistics about schemes in PPF assessment as at 31 March 2018, including comparisons with both the previous year and schemes in the universe/PPF itself.

		31 March 2018	**31 March 2017**
Schemes in assessment[20]	Number of schemes	91	78
	Number of members	106,000	88,000
	Total assets	£6.9b	£5.6b
	Total liabilities	£9.3b	£6.6b
	Funding level	74%	85%
Schemes in universe	Funding level	96%	91%

[19] For the purpose of this chapter we treat separate sections and segregated parts of the same scheme as one single scheme. We also include overfunded schemes. This is different from the approach in the PPF's Annual Report and Accounts which treats all segregated parts of schemes as separate schemes, and generally excludes overfunded schemes.
[20] These figures differ from those in the Annual Report and Accounts because of the exclusion of expected reapplications in *The Purple Book* and the use of a different set of actuarial assumptions.

10.2 Schemes entering assessment

Figure 10.1 | Number of schemes in assessment each year, as at 31 March



Source: PPF

Note: the figures in the chart exclude those schemes that both claimed and were subsequently rescued, rejected or withdrawn in the same year.

The number of schemes in assessment increased in the year to 31 March 2018 for the first time since 2010.

Figure 10.2 | Funding statistics for schemes in assessment each year, as at 31 March

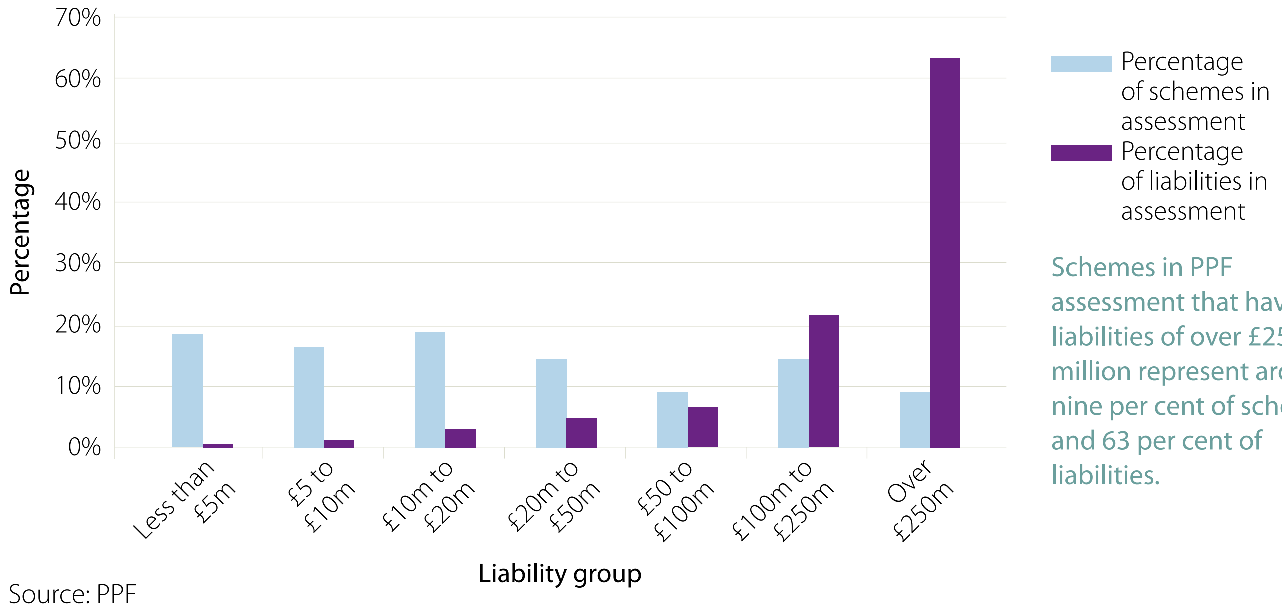
Year	Assets (£b)	Liabilities (£b)	(Deficit)/ Surplus (£b)	Funding level	Universe funding level
2007	4.0	4.7	-0.7	85%	109%
2008	4.2	5.4	-1.2	78%	99%
2009	6.7	9.4	-2.8	71%	80%
2010	8.9	10.0	-1.1	89%	104%
2011	9.5	10.9	-1.4	87%	100%
2012	6.2	8.4	-2.2	74%	83%
2013	5.8	7.6	-1.8	77%	84%
2014	5.8	7.6	-1.7	77%	97%
2015	5.3	7.5	-2.3	70%	84%
2016	5.0	7.4	-2.4	68%	86%
2017	5.6	6.6	-1.0	85%	91%
2018	6.9	9.3	-2.4	74%	96%

Source: PPF

Following some large claims, the funding level at 31 March 2018 was 74 per cent.

10.3 Scheme demographics

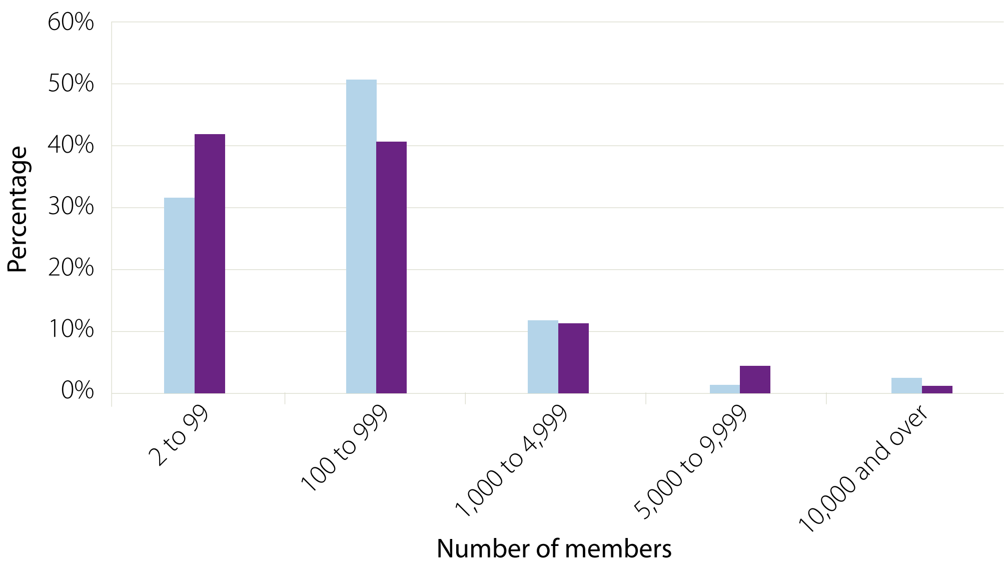
Figure 10.3 | Percentage of schemes and percentage of s179 liabilities grouped by size of liabilities for schemes in assessment, as at 31 March 2018



Source: PPF

Schemes in PPF assessment that have liabilities of over £250 million represent around nine per cent of schemes and 63 per cent of liabilities.

Figure 10.4 | Proportion of schemes in assessment by membership size

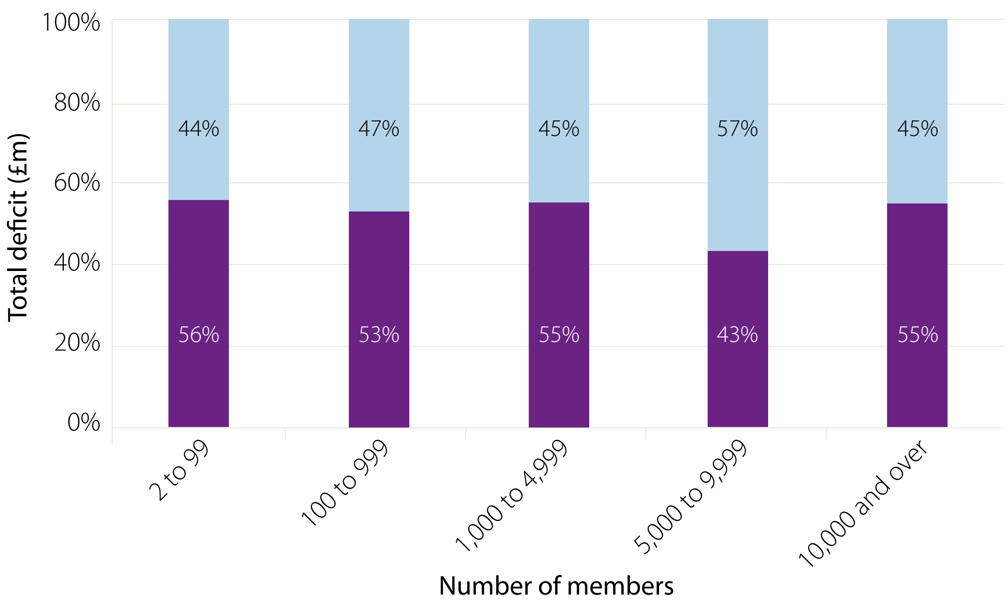


Source: PPF

2017
2018

Over 80 per cent of schemes in assessment have fewer than 1,000 members.

Figure 10.5 | Maturity of schemes in assessment by membership size



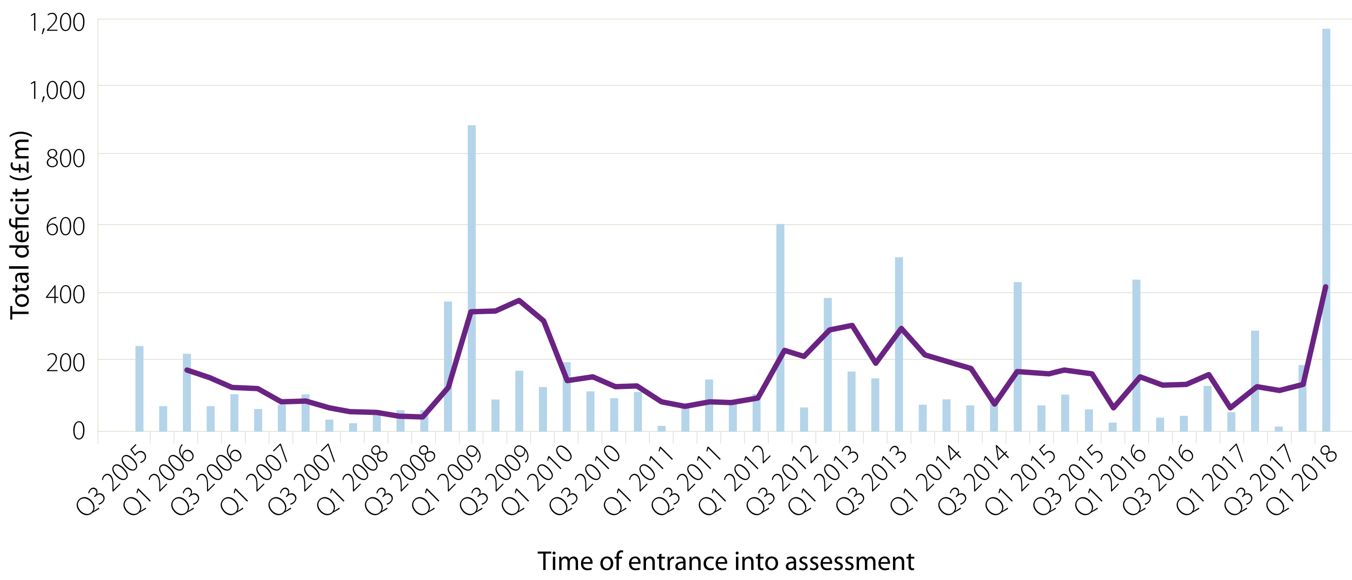
Source: PPF

Pensioners
Deferred members

The proportion of pensioners in schemes in PPF assessment is relatively stable across membership size, except schemes with 5,000 to 9,999 members where it is a little larger.

10.4 Funding level

Figure 10.6 | Total s179 deficits for schemes entering an assessment period

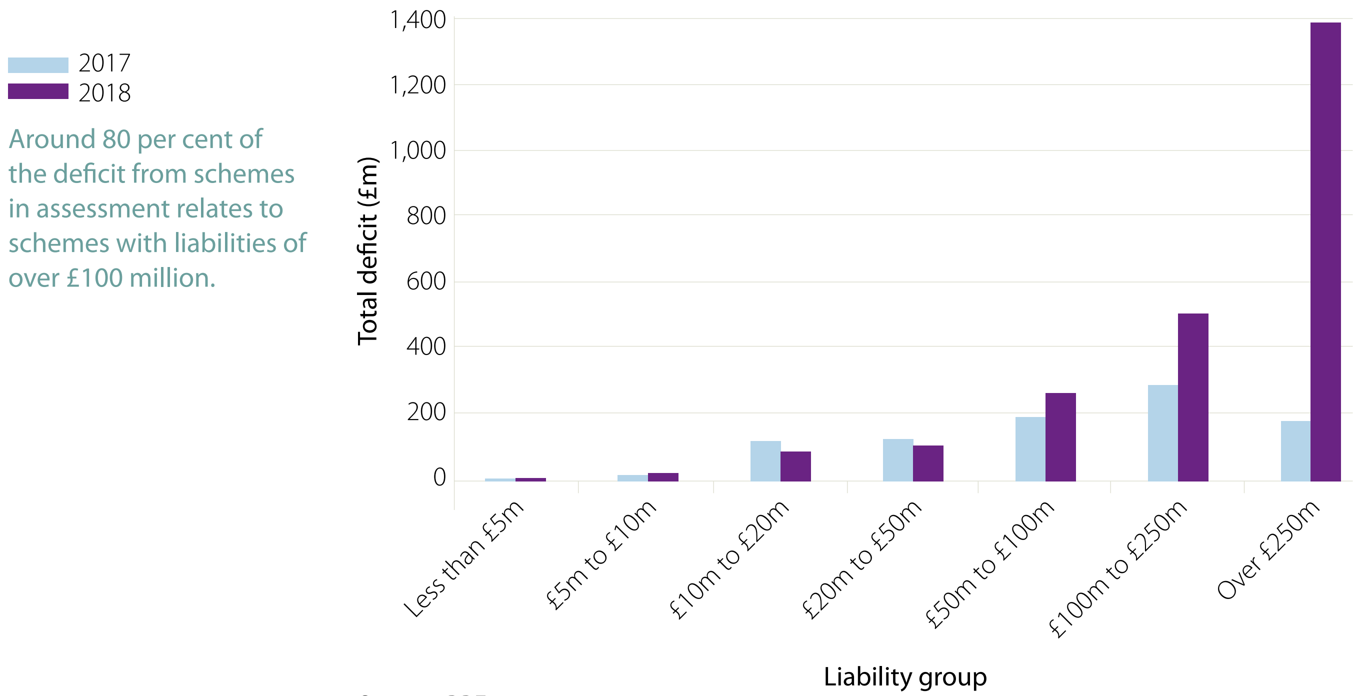


Total deficit
Quarterly moving average

Source: PPF

The total deficit of schemes entering assessment in the year to 31 March 2018 was £1,661 million, a large increase from £261 million the year before due to a small number of large claims.

Figure 10.7 | Total s179 deficit of schemes in assessment by liability size



Source: PPF

Around 80 per cent of the deficit from schemes in assessment relates to schemes with liabilities of over £100 million.

11 PPF compensation 2017/18

11.1 Summary

When a scheme transfers into the PPF, we generally pay compensation of 90 per cent of the scheme pension (subject to a compensation cap) to members who have not reached their Normal Pension Age (NPA) at the date the scheme entered assessment. We will generally pay a starting level of compensation equivalent to 100 per cent of the scheme pension to those members who are over their NPA at the start of the assessment period.

Here are some of the key statistics featured in this chapter:

	31 March 2018	**31 March 2017**
PPF compensation paid in the year	£725m	£661m
Number of pensioner and dependant members in receipt of compensation	135,377	129,661
Average annual amount of compensation payments to pensioners and dependants	£4,380	£4,309
Number of deferred pensioner members*	107,759	110,478
Average annual compensation accrued by deferred pensioner members (ignoring any impact of the compensation cap)	£3,362	£3,361

*(i.e. members with compensation not yet in payment)

11.2 Total compensation and other member statistics

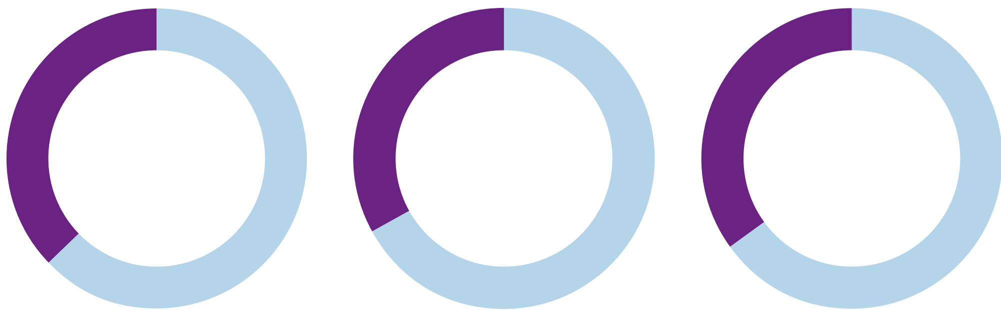
Figure 11.1 | Total compensation and number of members

Year ended 31 March	Total compensation paid	Number of members[21]		
		Pensioners	Deferred members	Total
2007	1.4	1,457	5,621	7,078
2008	17.3	3,596	8,577	12,173
2009	37.6	12,723	18,009	30,732
2010	81.6	20,775	26,058	46,833
2011	119.5	33,069	42,063	75,132
2012	203.3	57,506	70,608	128,114
2013	331.8	80,665	91,353	172,018
2014	445.1	95,599	100,070	195,669
2015	564.0	114,028	110,681	224,709
2016	616.0	121,059	109,143	230,202
2017	661.3	129,661	110,478	240,139
2018	724.5	135,377	107,759	243,136

Source: PPF

Total compensation paid in the year to 31 March 2018 was £724.5 million, nearly 10 per cent above the amount paid in the year to 31 March 2017.

Figure 11.2 | Sex of members in the PPF



Pensioners
- Male (63%)
- Female (37%)

Deferred pensioners
- Male (67%)
- Female (33%)

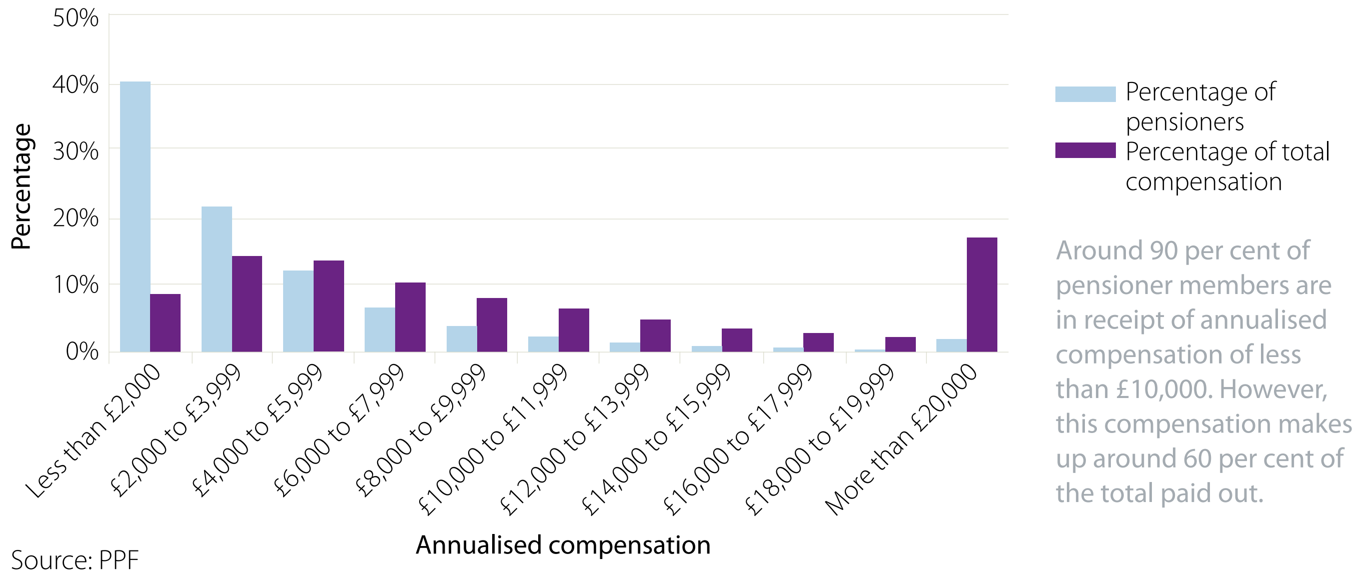
Overall
- Male (65%)
- Female (35%)

Source: PPF

65 per cent of our members are male.

[21] Please note that these refer to the numbers of member records. As some members have more than one record (for example because of different periods of service or tranches of benefit), these numbers may be different to those stated in the PPF's Annual Report and Accounts, for which purpose individuals are counted only once, regardless of the number of records.

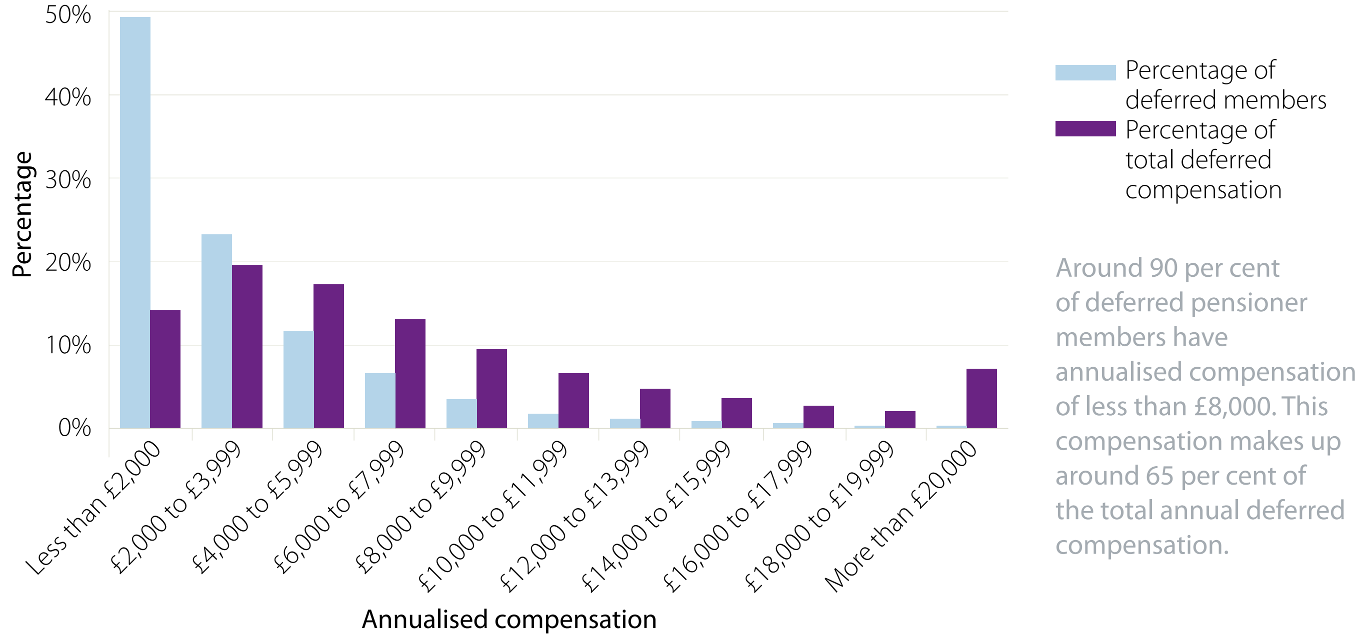
Figure 11.3 | Distribution of pensioners by annualised compensation level



Source: PPF

Around 90 per cent of pensioner members are in receipt of annualised compensation of less than £10,000. However, this compensation makes up around 60 per cent of the total paid out.

Figure 11.4 | Distribution of deferred pensioners by annualised compensation level



Source: PPF

Around 90 per cent of deferred pensioner members have annualised compensation of less than £8,000. This compensation makes up around 65 per cent of the total annual deferred compensation.

Figure 11.5 | Proportions of members and spouses/other dependants within the current PPF pensioner population

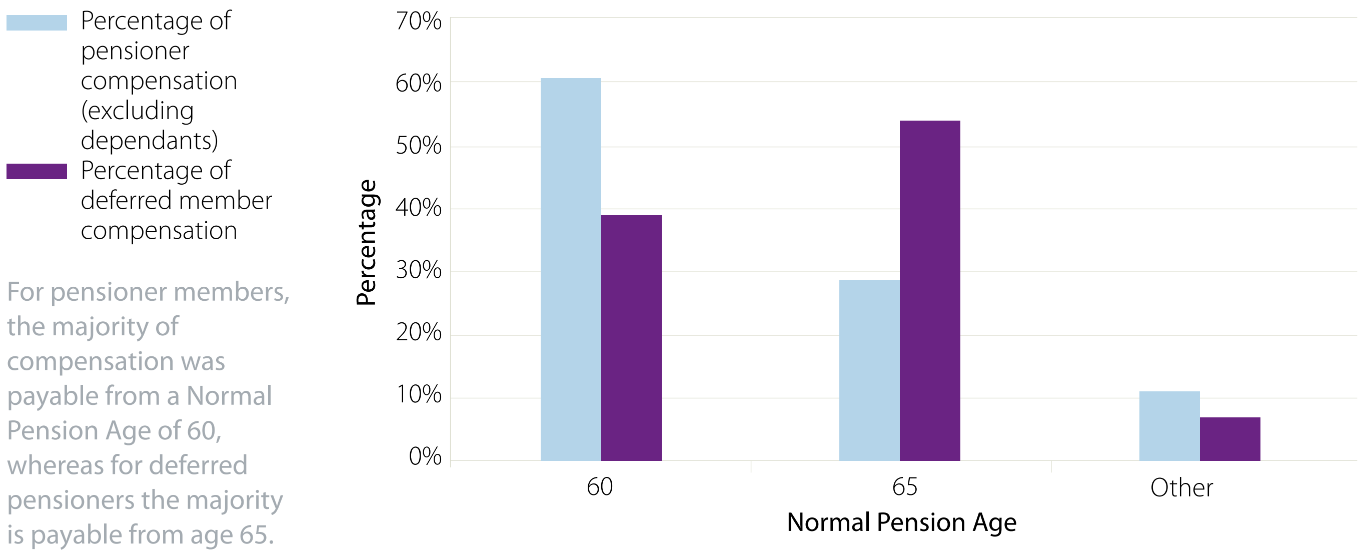
Spouses and other dependants make up 15 per cent of total pensioners and 10 per cent of compensation.

	Number within pensioner population	Percentage of total population	Annualised compensation (£m)	Percentage of total annualised compensation
Members	114,403	85%	532	90%
Dependants	20,974	15%	61	10%
Total	**135,377**	**100%**	**593**	**100%**

Source: PPF

Note: annualised compensation is less than compensation paid in the year to 31 March 2018 as the latter includes cash sums taken upon retirement, and takes account of member movements (e.g. deaths and retirements) over the year.

Figure 11.6 | Distribution of pensioner (excluding dependants) and deferred member compensation by Normal Pension Age (NPA)[22]

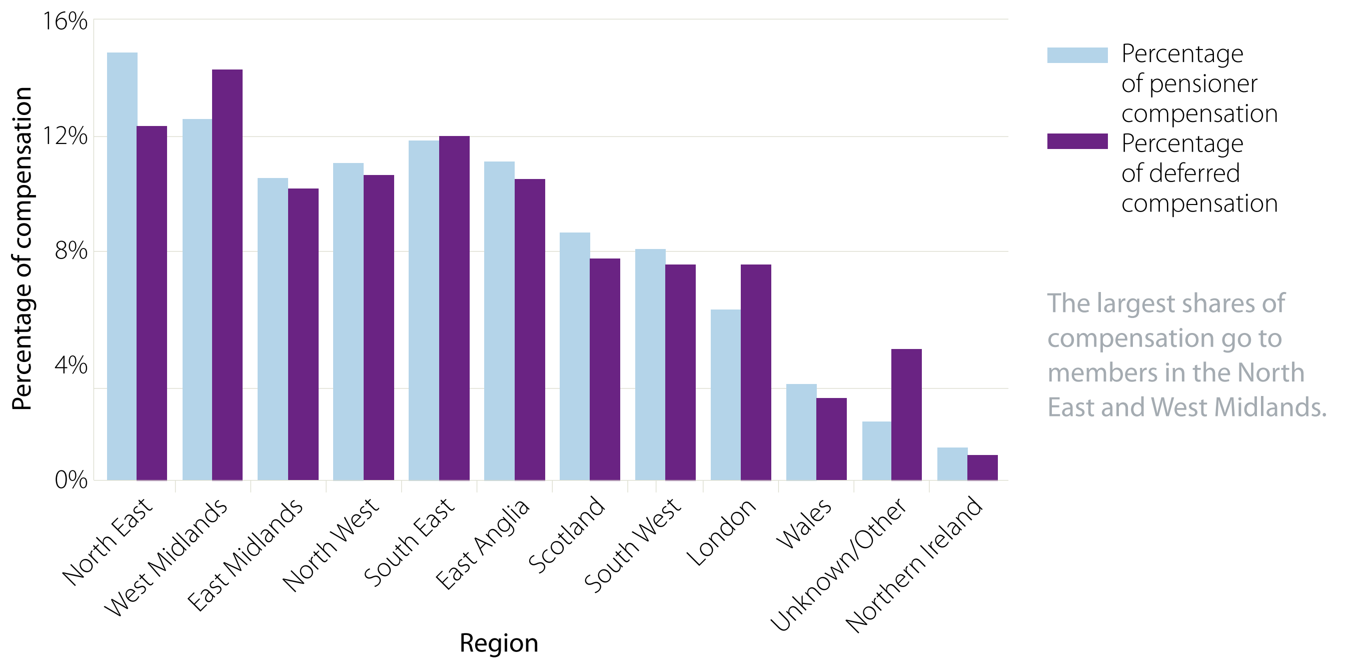


For pensioner members, the majority of compensation was payable from a Normal Pension Age of 60, whereas for deferred pensioners the majority is payable from age 65.

Source: PPF

[22] In previous years the proportions shown in this chart for pensioners also included dependant members. This year we have removed dependants, which has caused a lower proportion than before to show as 'other'.

Figure 11.7 | Annualised compensation by UK region



The largest shares of compensation go to members in the North East and West Midlands.

Source: PPF

Figure 11.8 | Annualised compensation for pensioners and deferred pensioner members before 6 April 1997 and after 5 April 1997

	Pensioners		Deferred pensioners	
	Annualised compensation (£m)	Percentage	Annualised compensation (£m)	Percentage
Pre-6 April 97	419	71%	161	44%
Post-5 April 97	174	29%	201	56%
Total	**593**	**100%**	**362**	**100%**

Just over 70 per cent of compensation for pensioners was accrued before 6 April 1997.

Source: PPF

12 Risk reduction

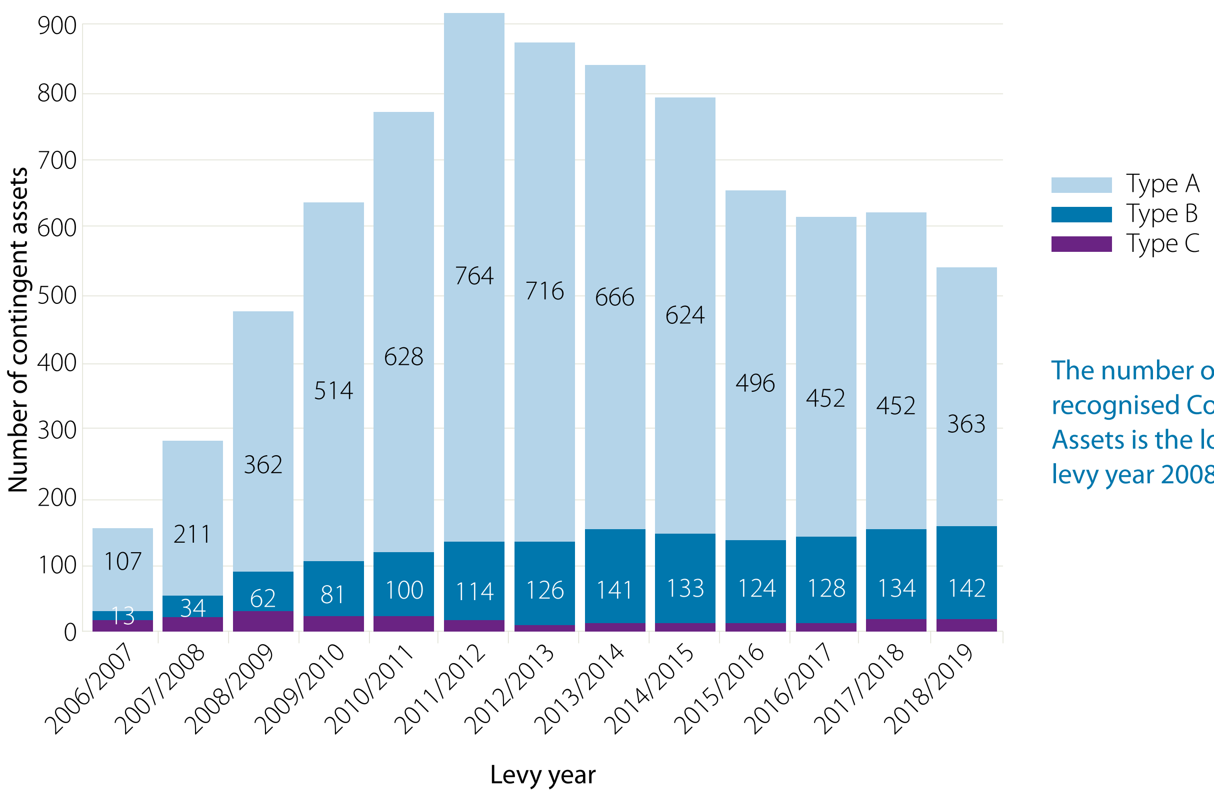
12.1 Summary

- The total number of Contingent Assets submitted to the PPF for the 2018/19 levy year was 519, compared with 601 in 2017/18. This reflects a reduction in the number of Type A Contingent Assets (employer parent or group guarantees).
- Data from the Office for National Statistics (ONS) covering around 360 large pension schemes (including 100 local authorities and some DC schemes) show that in the year to 31 March 2018 sponsoring employers made £13.5 billion in special contributions (i.e. those in excess of regular annual contributions) compared with £12.2 billion in the year to 31 March 2017 (updated since *The Purple Book 2017* in the source data).
- Analysis of The Pensions Regulator's latest Technical Provisions and recovery plan data shows that in Tranche 11[23], the average recovery plan length was 7.8 years, just under a year less than that of Tranche 8 (comparable given the three-year valuation cycle) and 0.3 years longer than Tranche 10. The average funding level as measured by assets divided by Technical Provisions was 87.2 per cent in Tranche 11, 4.8 percentage points higher than Tranche 8.
- Technical Provisions as a percentage of s179 liabilities dropped to 95.7 per cent from 98.5 per cent in Tranche 8. The fall as a percentage of buy-out liabilities was similar, from 71.3 per cent to 69.4 per cent.
- Total risk transfer business covering buy-outs, buy-ins and longevity swaps amounted to £160 billion between the end of 2007 and the second quarter of 2018. Just over 40 per cent of these deals were longevity swaps.
- Over the year to 30 June 2018, the total value of risk transfer deals was £22 billion, up from £16 billion in the year to 30 June 2017, but nevertheless a relatively small amount in the context of the whole universe of schemes.
- In Q1 2018, the value of pension liabilities transferred out by pension scheme members was the highest since the introduction of Pensions Freedoms in April 2015, and an all-time record, but again a relatively small amount in the context of the whole universe of schemes.

[23] Tranche 11 covers schemes with valuation dates between 22 September 2015 and 21 September 2016.

12.2 Contingent Assets

Figure 12.1 | Contingent Assets by type



The number of recognised Contingent Assets is the lowest since levy year 2008/2009.

Source: PPF

Type A Contingent Assets are parent/group companies' guarantees to fund the scheme, most commonly to a pre-arranged percentage of liabilities.

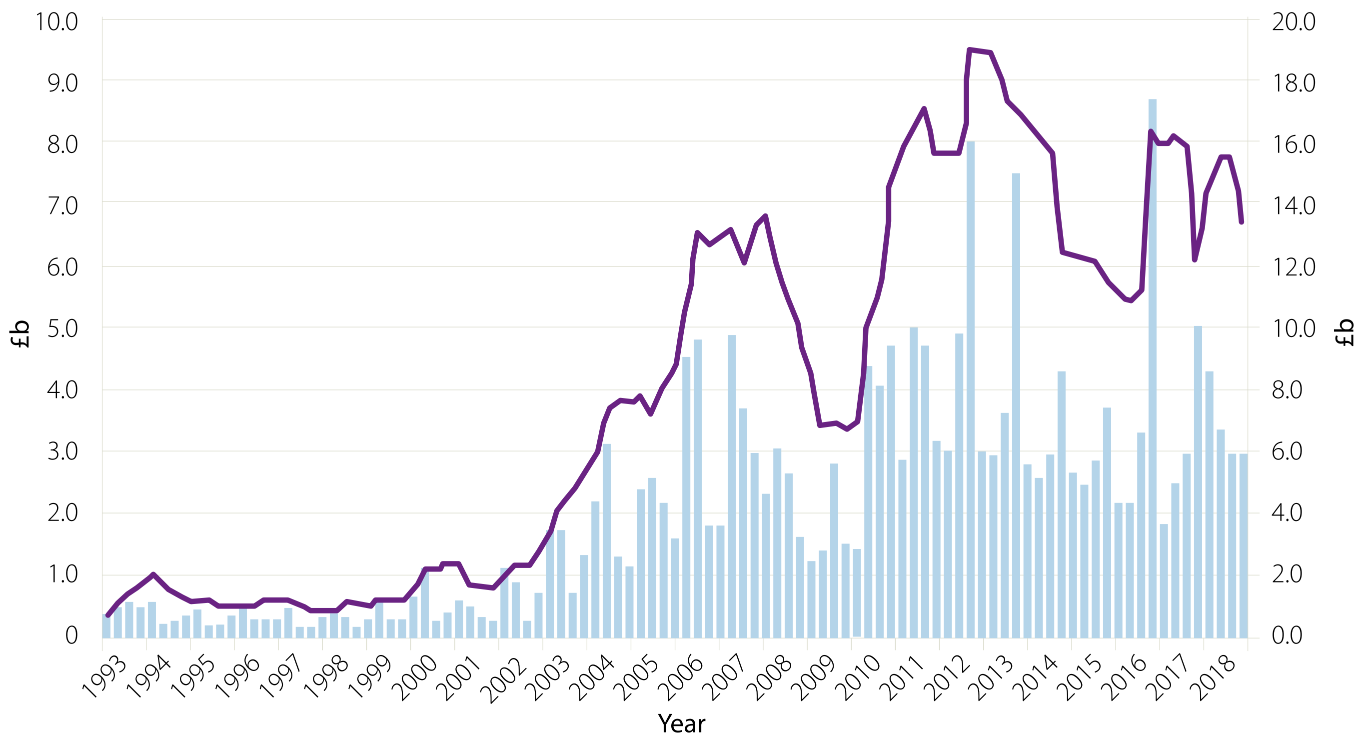
Type B Contingent Assets comprise security over holdings of cash, real estate and/or securities.

Type C Contingent Assets consist of letters of credit and bank guarantees.

12.3 Special contributions

ONS data covering around 360 large pension schemes shows that employers made £13.5 billion in special contributions (to DB schemes) in the year to 31 March 2018, higher than the £12.2 billion paid in the year to 31 March 2017.

Figure 12.2 | Special contributions



Quarterly special contributions (LHS)

Four-quarter total special contributions (RHS)

Source: MQ5, 'Investment by Insurance Companies, Pension Funds and Trusts', ONS

Note: as the ONS receives new data, the figures for previous time periods may be updated.

In the first quarter of 2018, employers made £2.9 billion in special contributions.

12.4 The scheme funding regime

Figure 12.3 | Technical Provisions and recovery plan lengths (unweighted averages)

Tranche	Year of valuation	Number of recovery plans	Average length of recovery plan (years)	Assets as a percentage of Technical Provisions	Technical Provisions as a percentage of s179 liabilities[24]	Technical Provisions as a percentage of buy-out liabilities
1	2005-06	2,127	8.1	84.2%	103.4%	67.7%
2	2006-07	1,888	7.7	87.3%	111.5%	71.0%
3	2007-08	1,840	8.6	86.3%	109.0%	74.6%
4	2008-09	2,048	9.7	74.0%	100.8%	72.8%
5	2009-10	1,937	8.5	82.5%	111.6%	73.8%
6	2010-11	1,652	7.8	88.2%	108.4%	72.4%
7	2011-12	1,770	8.5	81.0%	99.0%	71.2%
8	2012-13	1,726	8.5	82.4%	98.5%	71.3%
9	2013-14	1,530	8.0	89.6%	102.4%	71.8%
10[25]	2014-15	1,403	7.5	88.9%	96.8%	69.3%
11[26]	2015-16	1,426	7.8	87.2%	95.7%	69.4%

In Tranche 11, the average recovery period was 7.8 years, just under a year shorter than Tranche 8 (comparable given the three-year valuation cycle).

Source: 'Scheme funding statistics, Appendix', The Pensions Regulator, June 2018

Notes:

a) Valuation dates run from 22 September to 21 September.

b) 78.8 per cent of schemes with Tranche 11 valuations reported in respect of Tranches 8, 5, and 2.

[24] Note that the average funding level and the ratio of TPs to s179 liabilities only covers schemes which were in deficit on their TP basis.
[25] Please note that as TPR has received additional Tranche 10 information since the publication of *The Purple Book 2017*, this row has been updated in *The Purple Book 2018*.
[26] Tranche 11 covers schemes with valuation dates between 22 September 2015 and 21 September 2016.

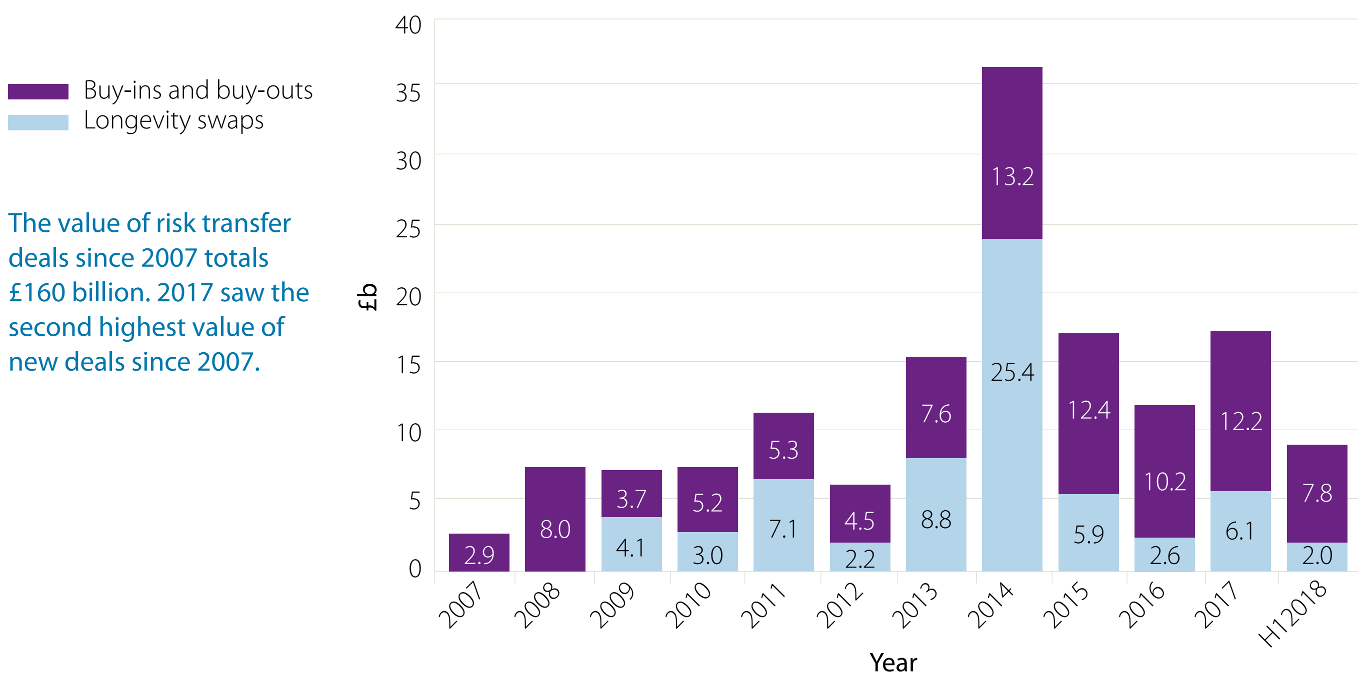
Risk reduction

12.5 Buy-out, buy-in and longevity hedging

Buy-out and buy-in transactions provide schemes with the opportunity to remove risk relating to all or part of their liability. Under a buy-out deal, a scheme transfers its entire liability and scheme assets to an insurer in exchange for a premium. Insurers tend to require assets significantly in excess of Technical Provisions to compensate for the risk transferred. Buy-in deals result in an insurance policy as a scheme asset.

While both longevity swaps and buy-in/buy-out can mitigate the risk of greater than expected life expectancy, under the former there is no transfer of the underlying scheme assets to a counterparty. Longevity swaps entail the pension scheme exchanging fixed payments for cash flows that vary in accordance with the longevity experience of a reference population (either the named scheme members or a wider sample).

Figure 12.4 | Value of risk transfer deals since 2007



Source: Hymans Robertson, 'Buy-outs, buy-ins and longevity hedging'

The value of risk transfer deals since 2007 totals £160 billion. 2017 saw the second highest value of new deals since 2007.

Risk reduction

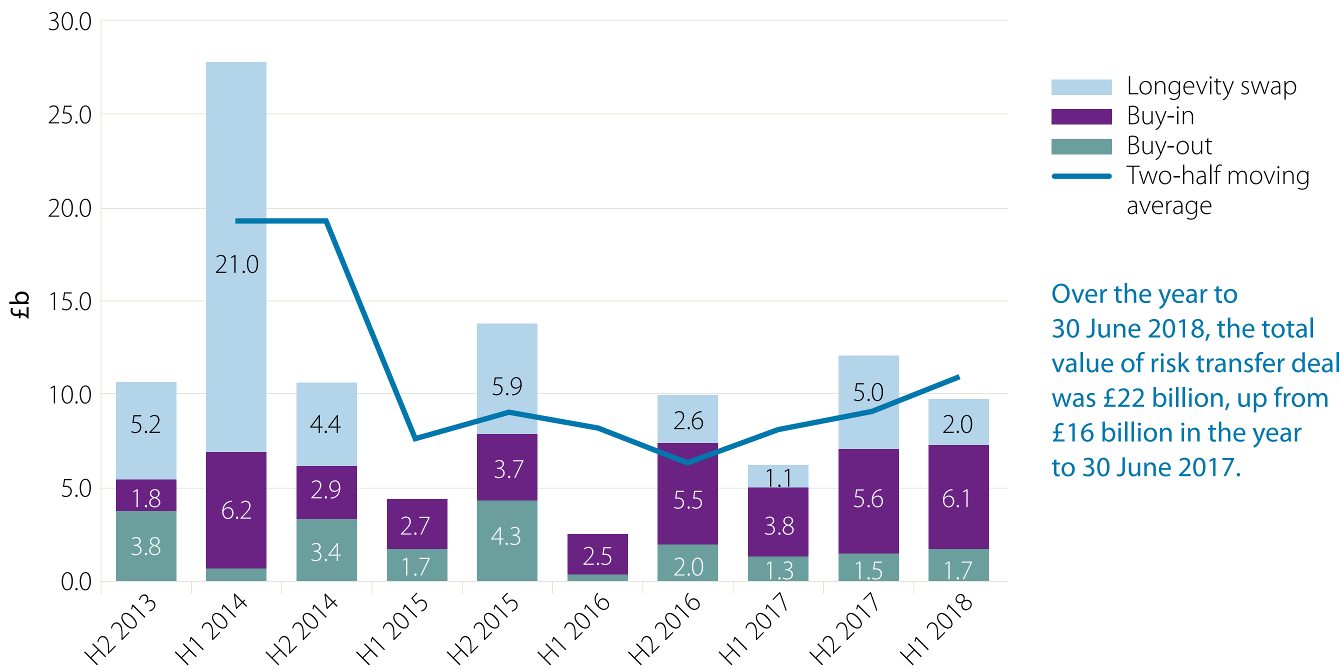
Figure 12.5 | Number of risk transfer deals since 2010

Year	Number of buy-ins/buy-outs	Number of longevity swaps
2010	174	1
2011	171	5
2012	167	2
2013	219	10
2014	177	5
2015	176	4
2016	104	5
2017	132	4
H1 2018	76	1

Source: Hymans Robertson, 'Buy-outs, buy-ins and longevity hedging'

2017 saw an increase in the number of risk transfer deals from 2016 but still lower than every other year since 2010.

Figure 12.6 | Value of risk transfer deals since H2 2013



Source: Hymans Robertson, 'Buy-outs, buy-ins and longevity hedging'

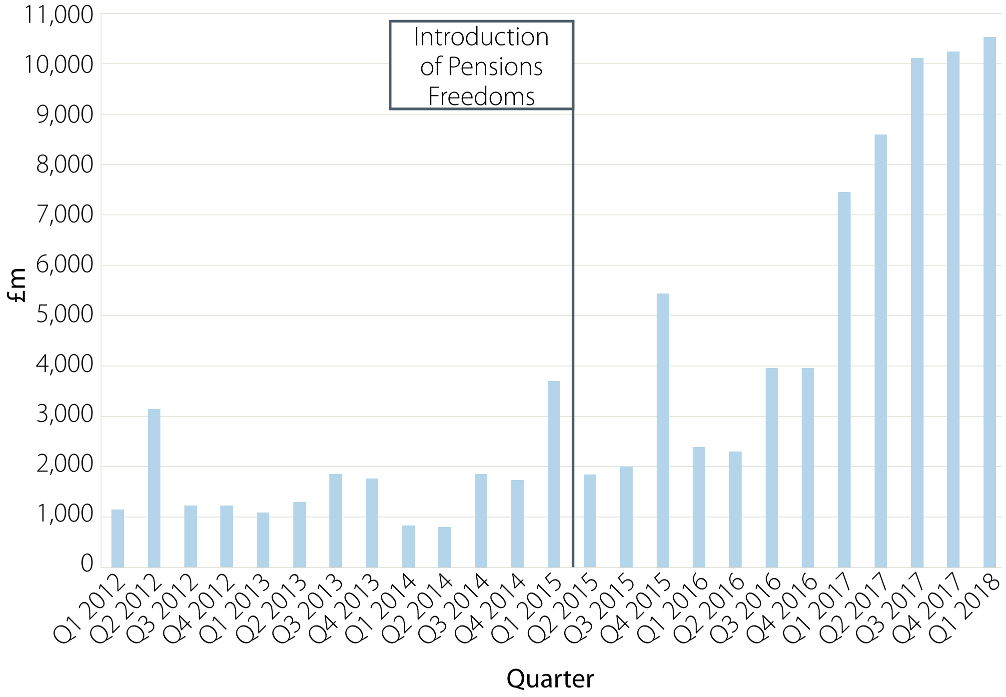
Over the year to 30 June 2018, the total value of risk transfer deals was £22 billion, up from £16 billion in the year to 30 June 2017.

12.6 Transfers out

Pension scheme members may, up to a certain age before their scheme's normal retirement age, choose to transfer their benefits out of their scheme. Members may choose to transfer their benefits out of a DB and into a DC pension scheme, potentially to take advantage of the flexibility posed by the latter, particularly following the introduction of the new Pensions Freedoms effective from April 2015.

The value of pension liabilities transferred out of pension schemes was the highest in Q1 2018 since the introduction of Pensions Freedoms in April 2015, and an all-time record.

Figure 12.7 | Transfers to other pension schemes



Source: MQ5, 'Investment by Insurance Companies, Pension Funds and Trusts', ONS

Note: the dataset for this chart is the same as that used for Figure 12.2.

Appendix – note on historical datasets

A dataset is collated for each edition of *The Purple Book*, including all appropriate schemes where scheme return information has been processed and cleaned. In subsequent months, more scheme returns are processed and cleaned and in 2006 and 2007 these were incorporated into the existing dataset to produce an 'extended' dataset. For 2006 and 2007, the increased coverage produced significantly different results to the original datasets. However, since then, datasets have been much larger and the increased coverage made only a small difference. Accordingly, comparisons are made with previous publications as follows:

- *Purple Books 2006* and *2007* – extended dataset
- *Purple Books 2008* to *2018* – original dataset

Scheme status

Scheme status in this *Purple Book* is split between:

- open schemes, where new members can join the DB section of the scheme and accrue benefits
- schemes closed to new members, in which existing members continue to accrue benefits
- schemes closed to new benefit accrual, where existing members can no longer accrue new years of service, and
- schemes that are winding up.

Because many larger employers have adopted the strategy of migrating their pension provision towards Defined Contribution (DC) by opening a DC section in an existing Defined Benefit (DB) scheme, many hybrid schemes may accept new members but no longer allow new (or existing) members to accrue defined benefits.

This has been handled differently across different editions of *The Purple Book*. In *The Purple Book 2006*, 40 per cent of members were in the open category and 25 per cent were categorised as 'part open'. The 'part open' category included a significant number of hybrids for which the DB element was closed. In *The Purple Book 2007*, the 'part open' category was removed and the percentage of schemes classified as open increased compared to *The Purple Book 2006*. Many hybrid schemes which had previously identified themselves as 'part open' now identified themselves as 'open'. In *The Purple Books 2008* and *2009*, we analysed the largest 100 schemes (by membership) in the hybrid category separately, so we could adjust the information provided in the scheme returns and remove potential misinterpretation caused by hybrid schemes with closed DB sections declaring themselves as open.

Improved levels of information on hybrid schemes are now available from the scheme returns and since *The Purple Book 2010* we have been able to adjust hybrid statuses to 'closed' where DB provision is not available to new members. Since 2013, those hybrids which no longer admit new DB accruing members are categorised as 'closed to new members'. In addition, where those schemes have no active DB membership it is assumed that the scheme is closed to new benefit accrual. The changes to the information available and consequent developing approach across the various editions of *The Purple Book* should be taken into account when comparing figures from different editions.

Glossary

Active member

In relation to an occupational pension scheme, a person who is in pensionable service under the scheme.

Annuity

Contract through which payments of a portion of a scheme's liabilities are met by a third party insurance company.

Assessment period

The time when a scheme is being assessed to see if the Pension Protection Fund can assume responsibility for it.

Asset-Backed Contribution (ABC)

A contractual arrangement between the pension scheme trustees and one or more entities within the sponsoring employer's group. ABCs involve regular payments to the scheme for the duration of the arrangement. The payment stream derives from an underlying asset. For more information see the 17/18 Levy Determination on our website.

Buy-out basis

The level of coverage the current assets will provide if all benefits were to be bought out in the name of the individual member with an insurance company. See also: full buy-out.

Closed (to new members)

The scheme does not admit new members. Existing members can continue to accrue pensionable service/benefits.

Closed (to new benefit accrual)

The scheme does not admit new members. Existing members no longer accrue pensionable service/benefits.

Deferred member

In relation to an occupational pension scheme, a person (other than an active or pensioner member) who has accrued rights under the scheme but is not currently accruing or being paid benefits under the scheme.

Deficit

A shortfall between what is assessed as needed to pay a scheme's benefits as they fall due (this is the scheme's 'liabilities') and the actual level of assets held by the scheme.

Deficit-Reduction Contribution (DRC)

A one-off (or irregular) contribution made by a scheme sponsor to a pension scheme to reduce the level of deficit.

Defined Benefit (DB)

Benefits are worked out using a formula that is usually related to the members' pensionable earnings and/or length of service. These schemes are also referred to as final salary or salary related pension schemes.

Defined Contribution (DC)

Benefits are based on the amount of contributions paid, the investment returns earned and the amount of pension this money will buy when a member retires. These schemes are also referred to as money purchase pension schemes.

Experian

A provider of insolvency scores used by the PPF for PPF levy calculations.

Full buy-out

The cost of insuring a pension scheme in the private market. The benefit assumed in private insurance is usually non-capped and thus could be greater than PPF coverage.

Gilt yield

The yield, if held to maturity, of a government (non-indexed) bond.

Hybrid scheme or partial DB scheme

A scheme that can provide defined benefits and DC benefits. An example of a hybrid scheme would be a scheme providing benefits on a DC basis but that is or was contracted out of the state scheme on either a Guaranteed Minimum Pension or Reference Scheme test basis.

Insolvency risk

The risk that a borrower will have to close business due to its inability to service either the principal or interest of its debt.

Insurance company

Insurance companies provide a range of services to pension schemes, including:

• asset investment

• asset management

• buy-in and buy-out

• investment advice and expertise

• custodian facilities, and

• scheme administration services.

Insurance policy

Investment class: a pooled fund provided by or a deposit administration contract purchased from an insurance company.

MQ5 data

The data from the ONS MQ5 enquiry is based on a sample of around 360 pension schemes. This comprises around 100 local authorities and about 260 public and private corporations (the PPF database excludes local authorities and public corporations). The sample has total assets of £1,100 billion, which is much higher than the PPF database. All schemes with more than 20,000 members are automatically included and schemes with less than 20,000 members are randomly selected. The sample is made up of what are known as 'superannuation and self-administered pension funds'. A self-administered pension fund is defined as an occupational pension schemes with units invested in one or more managed schemes or unit trusts. A superannuation pension fund is defined as an organisational pension programme created by a company for the benefit of its employees. The sample may also contain DC schemes.

Net funding position

Sum of assets less sum of liabilities, or sum of scheme funding positions. In a pool of schemes where schemes in deficit outweigh schemes in surplus, there is an aggregate deficit.

Official Bank Rate

The interest rate that the Bank of England charges banks for secured overnight lending. Also called the Bank of England base rate or BOEBR.

ONS

Office for National Statistics.

Open scheme

The scheme continues to accept new members, and benefits continue to accrue.

Pensioner member

A person who is currently receiving a pension from the scheme or from an annuity bought in the trustee's name.

Pension Protection Fund (PPF)

A statutory corporation run by the Board of the Pension Protection Fund, established under the Pensions Act 2004.

The Pensions Regulator (TPR)

The UK regulator of work-based pension schemes; an executive non-departmental public body established under the Pensions Act 2004.

PPF levy

This is the annual amount that a pension scheme is charged by the PPF. It is composed of a scheme-based levy and a risk-based levy. It is similar to an insurance premium.

Repurchase agreement (repo)

The sale of a security combined with an agreement to repurchase the same security at a higher price at a future date.

Risk-based levy

See PPF levy. Calculated on the basis of a pension scheme's deficit and insolvency risk of the sponsoring employer.

Scheme-based levy

See PPF levy. Calculated on the basis of section 179 liabilities and the number of members in the pension scheme.

Scheme funding position

The difference between the assets and liabilities of a pension scheme (scheme deficit if negative, scheme surplus if positive).

Scheme member

In relation to an occupational pension scheme, a scheme member is any person who:

- is an active member
- is a deferred member
- is a pensioner member
- has rights due to transfer credits under the scheme, or
- has pension credit rights under the scheme.

This includes scheme members whose only entitlements are equivalent pension benefits (EPBs), as those rights were earned through pensionable employment. Members (for occupational and personal schemes) do not include dependants of members. Those whose only entitlements are lump sum benefits payable upon death are also not included.

Section 179 (s179) valuation

To calculate the risk-based pension protection levy the Board of the Pension Protection Fund must take account of scheme underfunding. To achieve consistency in determining underfunding, schemes can complete a PPF valuation (section 179). This valuation will be based on the level of the scheme's assets and liabilities. The liabilities will be based on the scheme benefits taking into account key features of the levels of compensation paid by the Board of the Pension Protection Fund as set out in Schedule 7 of the Pensions Act.

Swap

Investment: a contract calling for the exchange of payments over time. Often one payment is fixed in advance and the other is floating, based on the realisation of a price or interest rate.

Technical Provisions (TPs)

The TPs are a calculation made by the actuary of the assets needed for the scheme to meet the statutory funding objective. These include pensions in payment (including those payable to survivors of former members) and benefits accrued by other members and beneficiaries, which will become payable in the future.

Trustee

A person or company, acting separately from a scheme's employer, who holds assets in trust for the beneficiaries of the scheme. Trustees are responsible for making sure that the pension scheme is run properly and that members' benefits are secure.

Winding up/wound up

After the wind up is complete (the scheme is wound up), there will be no assets or liabilities left in the scheme, and the scheme will cease to exist as a legal entity. Winding up describes the process of reaching wind up from the normal ongoing status. To make sure that members will still receive benefits, there are several options:

- transferring pension values to another pension arrangement
- buying immediate or deferred annuities, or
- transferring the assets and liabilities of the scheme to another pension scheme.

The scheme must be wound up in accordance with the scheme rules and any relevant legislation.

Charts and tables

Chapter 6:

Chapter 7:

Chapter 8:

Chapter 9:

Chapter 10:

Chapter 11:

Chapter 12:

How to contact us:

Pension Protection Fund
Renaissance
12 Dingwall Road
Croydon
CR0 2NA

www.ppf.co.uk

Phone: 0345 600 2541

Designed and produced by Sequel Group
www.sequelgroup.co.uk