

# 5. Funding sensitivities

## Summary

- This chapter shows how the funding of DB schemes and markets has changed since 2006, and how the funding of DB schemes at 31 March 2020 would change as a result of plausible changes in markets and longevity.

The following sections cover:

- The historical changes in s179 scheme funding since 2006. The series in this section take the estimated funding position at 31 March in previous years' *Purple Books*.
- Various funding sensitivities. All of these are on an s179 basis, taking the funding position as at 31 March 2020<sup>9</sup> as the base and using *The Purple Book 2020* dataset.

## Change in s179 funding position over time

- Both the historical net funding position and funding ratio had been broadly trending downwards between March 2006 and August 2016. This trend has subsequently reversed and while both measures have been volatile over the last year, they are still significantly higher than the low points they reached in 2016.
- The proportion of schemes in deficit on an s179 basis was 63 per cent in March 2020, which is lower than the average (since March 2006) of 71 per cent.

## Funding sensitivities as at 31 March 2020

- A 0.1 percentage point (10 basis point) rise in both nominal and real gilt yields increases the 31 March 2020 net funding position by £17.7 billion from -£90.7 billion to -£73.0 billion. A 2.5 per cent rise in equity prices would improve the net funding position by £7.8 billion.
- A 0.1 percentage point (10 basis point) reduction in both nominal and real gilt yields raises aggregate scheme liabilities by 1.9 per cent and raises aggregate scheme assets by 1.0 per cent. A 2.5 per cent increase in equity markets increases scheme assets by 0.5 per cent.
- If all members were to live two years longer than expected, s179 liabilities would increase by £148.2 billion, or 8.3 per cent.

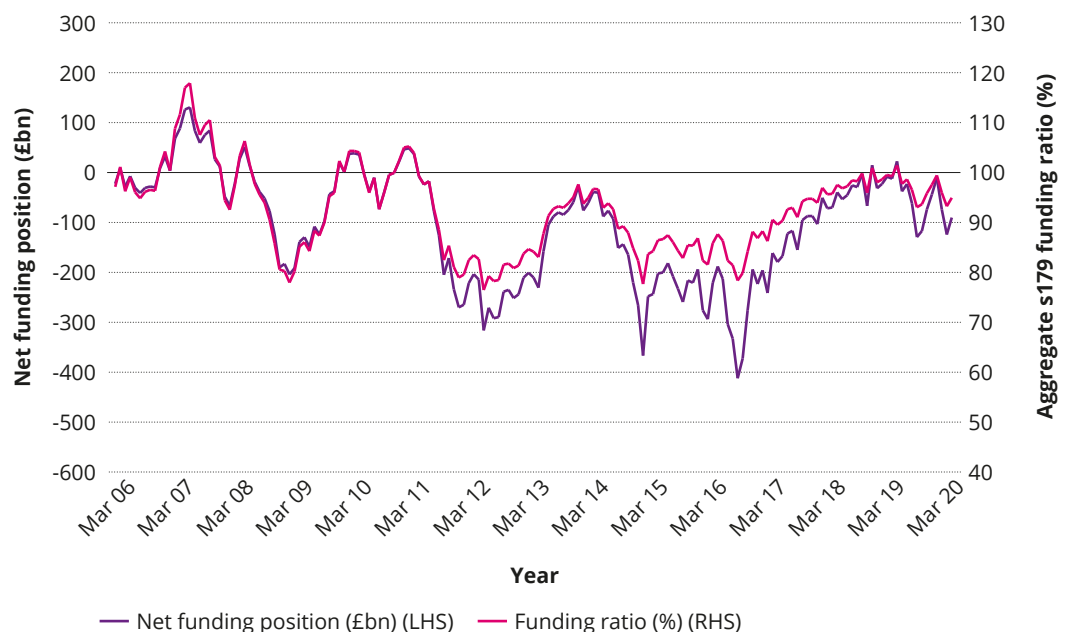
## Historical changes in s179 scheme funding since 2006

The estimated funding position of the universe of schemes can change over time owing to 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 ratio and net funding position of pension schemes in *The Purple Book* datasets**

Although the aggregate s179 funding ratio and net funding position have been volatile over the last year, they are both still significantly higher than their low points in 2016.

Source: PPF



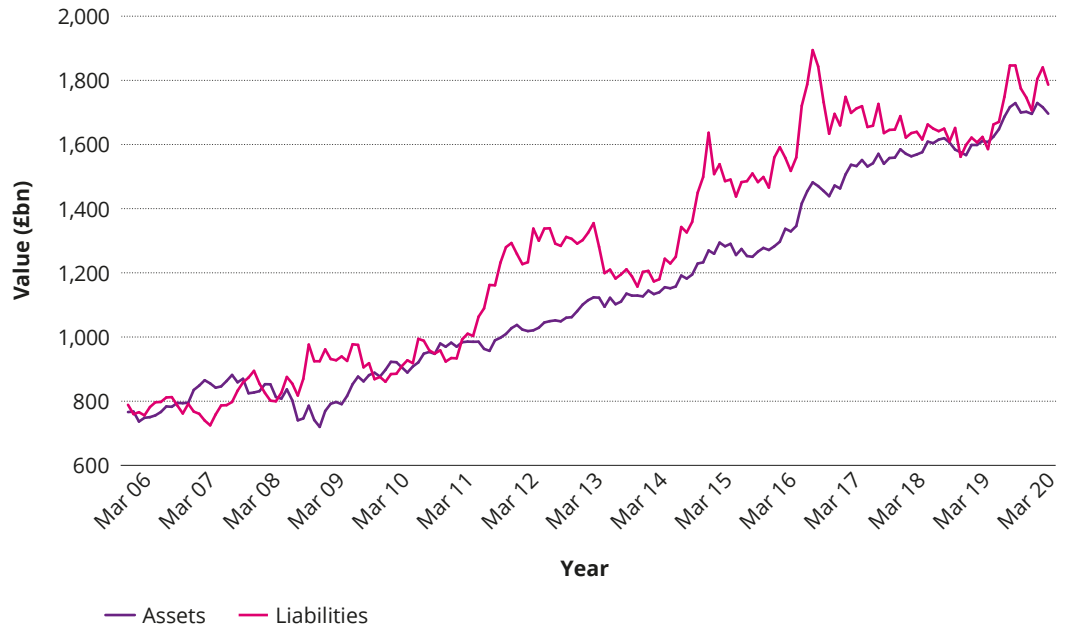
9 Using the valuation guidance as in Chapter 4. For more information, see the PPF website.

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

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

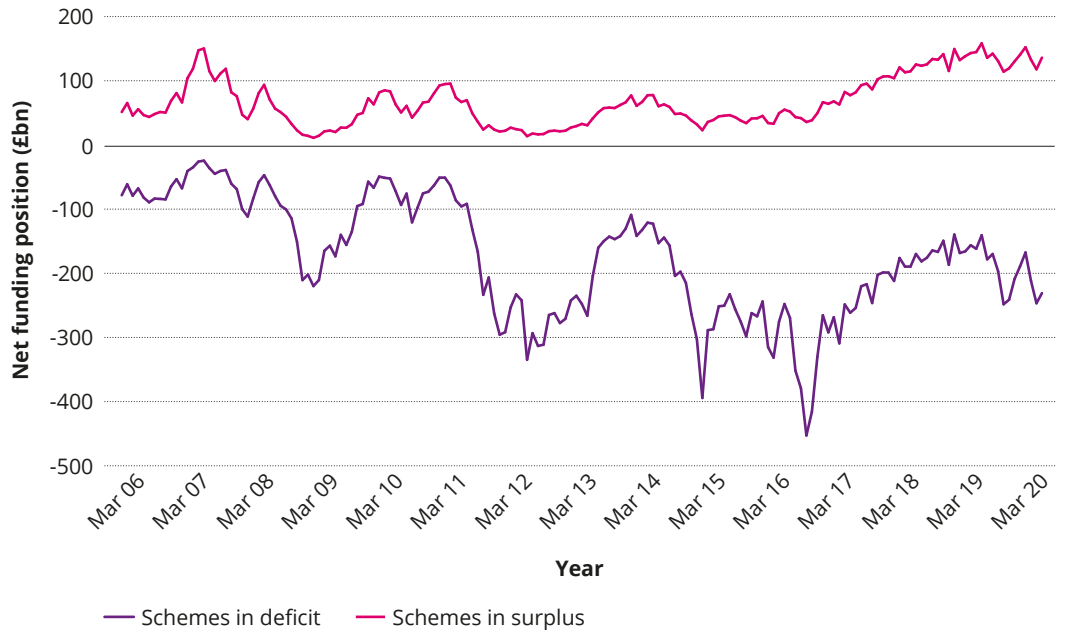
Source: PPF



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

The deficit of schemes in deficit was at its largest in August 2016 at £451 billion. At 31 March 2020 this deficit was £229 billion, up £69 billion from the £160 billion experienced at 31 March 2019.

Source: PPF

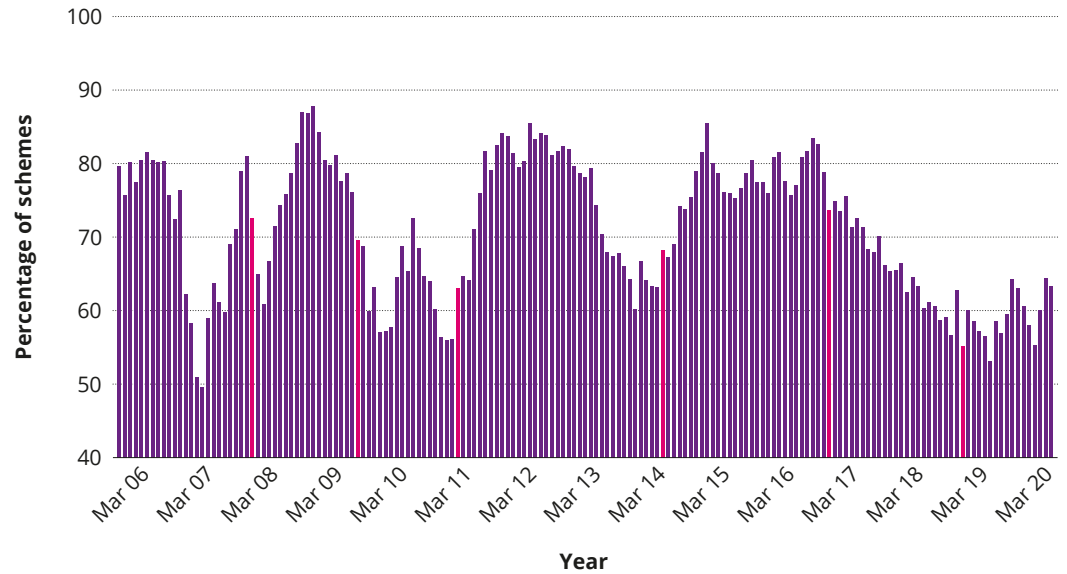


The funding position of schemes in surplus has been more stable over time than the funding position of schemes in deficit.

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

In March 2020, 63 per cent of schemes were in deficit, up from 57 per cent the previous year.

Source: PPF



The magenta lines indicate months in which changes were made to the assumptions used to value schemes on an s179 measure. 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 and November 2018 reduced the number of schemes in deficit by 157 and 437 respectively.

**Figure 5.5 | Movements in gilt yields**

The downward trend of gilt yields has continued. They reached their all-time low in March 2020.

Source: Bloomberg

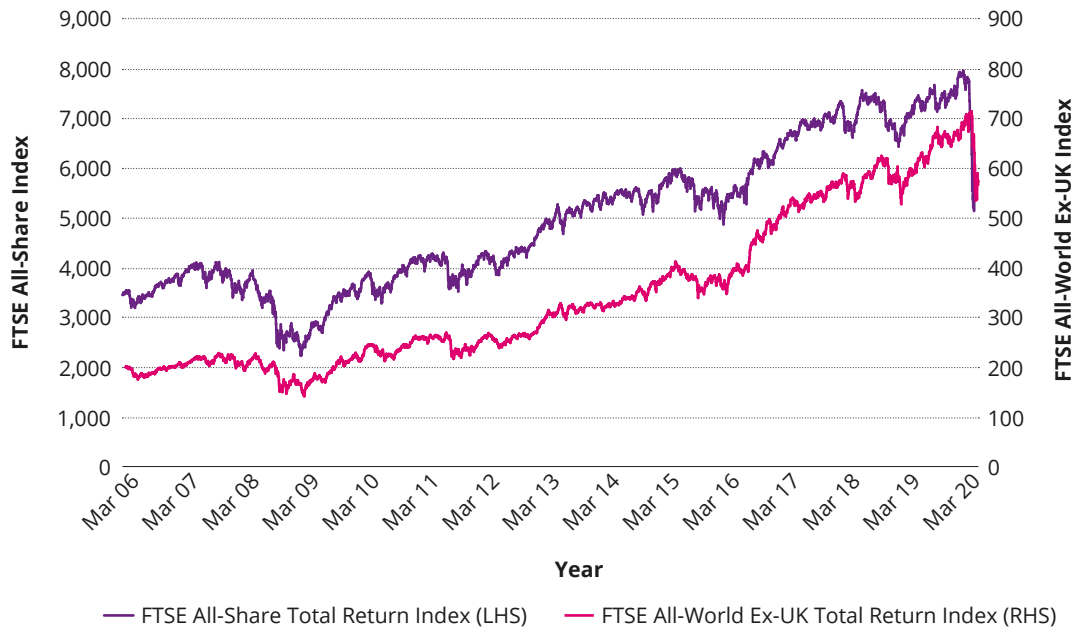


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Figure 5.6 | Movements in equity indices

The FTSE All-Share and All-World Ex-UK Total Return Indices reached all-time highs at the beginning of 2020 but declined sharply in March 2020.

Source: Bloomberg



Funding sensitivities: rules of thumb

Funding ratios 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. This section shows the effect on scheme funding positions of changes in equity and gilt markets. 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 have been accurately calculated and then the rest of the results have been calculated by pro-rating these two impacts.

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 -£90.7 billion as at 31 March 2020

Small changes in gilt yields have a more substantial impact on s179 funding positions than small changes in equity prices.

Source: PPF

Movement in equity prices	Assets less s179 liabilities (£bn)						
	Movement in gilt yields						
	-0.3pp	-0.2pp	-0.1pp	0.0pp	0.1pp	0.2pp	0.3pp
7.5%	-119.4	-102.2	-84.9	-67.3	-49.5	-31.6	-13.5
5.0%	-127.2	-110.1	-92.7	-75.1	-57.4	-39.4	-21.3
2.5%	-135.1	-117.9	-100.5	-82.9	-65.2	-47.2	-29.1
0.0%	-142.9	-125.7	-108.3	<b>-90.7</b>	-73.0	-55.0	-36.9
-2.5%	-150.7	-133.5	-116.1	-98.5	-80.8	-62.8	-44.7
-5.0%	-158.5	-141.3	-123.9	-106.3	-88.6	-70.6	-52.5
-7.5%	-166.3	-149.1	-131.7	-114.1	-96.4	-78.5	-60.3

A 0.1 point rise in both nominal and real gilt yields would have improved the end-March 2020 s179 net funding position by £17.7 billion from -£90.7 billion (bold) to -£73.0 billion (shaded). That's more than the £7.8 billion impact of a 2.5 per cent increase in equity prices (shaded).

**Figure 5.8 | Impact of changes in gilt yields and equity prices on assets from a base of 100 as at 31 March 2020**

Small changes in gilt yields have a slightly larger impact on assets than small changes in equity prices.

Source: PPF

Movement in equity prices	Assets relative to a base of 100						
	Movement in gilt yields						
	-0.3pp	-0.2pp	-0.1pp	0.0pp	0.1pp	0.2pp	0.3pp
7.5%	104.4	103.4	102.4	101.4	100.4	99.4	98.4
5.0%	104.0	102.9	101.9	100.9	99.9	98.9	98.0
2.5%	103.5	102.5	101.5	100.5	99.5	98.5	97.5
0.0%	103.1	102.0	101.0	100.0	99.0	98.0	97.0
-2.5%	102.6	101.6	100.6	99.5	98.5	97.6	96.6
-5.0%	102.1	101.1	100.1	99.1	98.1	97.1	96.1
-7.5%	101.7	100.7	99.6	98.6	97.6	96.6	95.7

A 2.5 per cent increase in equity prices would raise scheme assets by 0.5 per cent (shaded). A 0.3 point decrease in gilt yields would increase scheme assets by 3.1 per cent (shaded).

**Figure 5.9 | Impact of changes in gilt yields on s179 liabilities as at 31 March 2020**

A 0.1 percentage point movement in gilt yields would impact s179 liabilities by 1.9 per cent.

Source: PPF

Percentage change	Impact on s179 liabilities					
	Movement in both nominal and real gilt yields					
	-0.3pp	-0.2pp	-0.1pp	0.1pp	0.2pp	0.3pp
	5.8%	3.9%	1.9%	-1.9%	-3.9%	-5.8%

**Figure 5.10 | Impact of changes in nominal or real gilt yields on s179 liabilities as at 31 March 2020 (base = £1,791.3 billion)**

As at 31 March 2020, the s179 liabilities were almost twice as sensitive to changes in real yields as to changes in nominal yields.

Source: PPF

Percentage change	Impact on s179 liabilities			
	Change in nominal yields		Change in real yields	
	-0.1pp	0.1pp	-0.1pp	0.1pp
£bn	1,803.9	1,778.7	1,814.5	1,768.0
	0.7%	-0.7%	1.3%	-1.3%

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.

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**Figure 5.11 | Impact of changes in life expectancy assumptions on s179 liabilities as at 31 March 2020 (base = £1,791.3 billion)**

If individuals live two years longer than expected, s179 liabilities would increase by £148.2 billion, or 8.3 per cent. Conversely, if individuals live two years shorter than expected, s179 liabilities would decrease by £143.7 billion, or 8.0 per cent.

	s179 liabilities (£bn)	% change from base
Age rating +2 years	1,647.6	-8.0%
Age rating -2 years	1,939.5	8.3%

Source: PPF

The impact of increased length of life has been approximated by age rating down by two years – that is, replacing the life expectancy assumptions for each individual by an individual currently two years younger.