

www.pwc.co.uk

Consumer-led pension strategy – Workstream 5

Determining the optimal strategy

**Western Power
Distribution**

October 2016

pwc

Contact details

Chris Venables

Partner

E: chris.venables@pwc.com

T: +44(0) 7715 487048

Matthew Smith

Director

E: matthew.r.smith@pwc.com

T: +44(0) 7715 487128

Nick Secrett

Director

E: nicholas.p.secrett@pwc.com

T: +44(0) 7595 611398

Alison Blair

Director

E: alison.b.blair@pwc.com

T: +44(0) 7711 589018

Nick Forrest

Director

E: nick.forrest@strategyand.uk.pwc.com

T: +44(0) 7803 617744

Contents

1. Introduction

4

2. Expected present value of pension cost element of future bills

8

3. Variability in future bills due to pension costs

15

4. Immediate cost increase to remove future volatility

22

5. Existence of a pensions deficit

25

6. Comparison with practice of other UK pension schemes

28

7. Trapped surplus largely paid for by consumers

33

8. Overall summary of scoring assessment

36

Introduction

1

1.1 Background and context

Over the current decade the network companies face an unprecedented challenge of securing significant investment to maintain a reliable and secure network. As the regulator, Ofgem's role is to ensure that this investment is delivered at a fair price for consumers.

To help achieve this, Ofgem developed RIIO (Revenue = Incentives + Innovation + Outputs) – A performance based model for setting the network companies' price controls, which lasts for eight years. RIIO is designed to encourage network companies to:

- Put stakeholders at the heart of their decision making process;
- Invest efficiently to ensure continued safe and reliable services;
- Innovate to reduce network costs for current and future consumers; and
- Play a full role in delivering a low carbon economy and wider environmental objectives.

It is relatively early days in the new world of enhanced consumer consultation and to date a number of areas have been excluded from the consultation process by network operators. However, Ofgem have been explicit that pension costs (due to their complex nature and significant cost/risk to consumers) must now be included and the strategies adopted by network operators for running their pension schemes need to be in line with their consumer's views on efficiency.

Western Power Distribution ('WPD') instructed us in November 2015 to support them as they developed their approach to consulting with their consumers to determine the most efficient way to fund their pension schemes. The scope of our engagement included working with WPD to design and implement a methodology to seek consumers' views on how WPD should fund its pension schemes, using a combination of quantitative, qualitative and academic research based techniques. The engagement deadline was September 2016 in order to enable the results from the research to be implemented in the 2016 actuarial valuations of WPD's pension schemes.

During the early days of the engagement, Ofgem published a consultation on 16 March 2016 titled 'Second Consultation on Ofgem's policy for funding Network Operators' Pension Scheme Established Deficits.' This set-out the requirement for network operators to consult with consumers regarding their approach to funding their pension schemes. While the consultation document did not significantly alter the methodologies developed as part of our engagement, it did provide additional validation of the approach taken.

Some relevant excerpts from the consultation document are as follows:

1.6 We also outlined a marked shift from our current approach, that envisages penalties for NWOs that are outliers in the way their Pension Scheme Established Deficits are managed or valued, to **'a new approach that looks instead to NWOs to demonstrate how they are participating in the governance of pension schemes on behalf of the consumers' (who are underwriting the risks involved).**

We believe this approach more constructively recognises the substance of relationships between NWOs and pension scheme trustees who are ultimately responsible for the schemes. Respondents also broadly supported the direction of this thinking.

1.7 The aim of our proposed reforms is two-fold: (a) to underline Ofgem's commitment to consumer funding of Pension Scheme Established Deficits, which should help to minimise the cost of financing the networks themselves to the benefit of consumers, and **(b) to encourage NWOs to pursue consumer-focused strategies for managing their commitments.**

1.10 NWOs have responsibilities towards their consumers and the strength of the employer covenant is in part underpinned by our funding commitment on behalf of consumers. **This means we can reasonably look to NWOs to represent the interests of consumers when they participate in pension scheme governance**

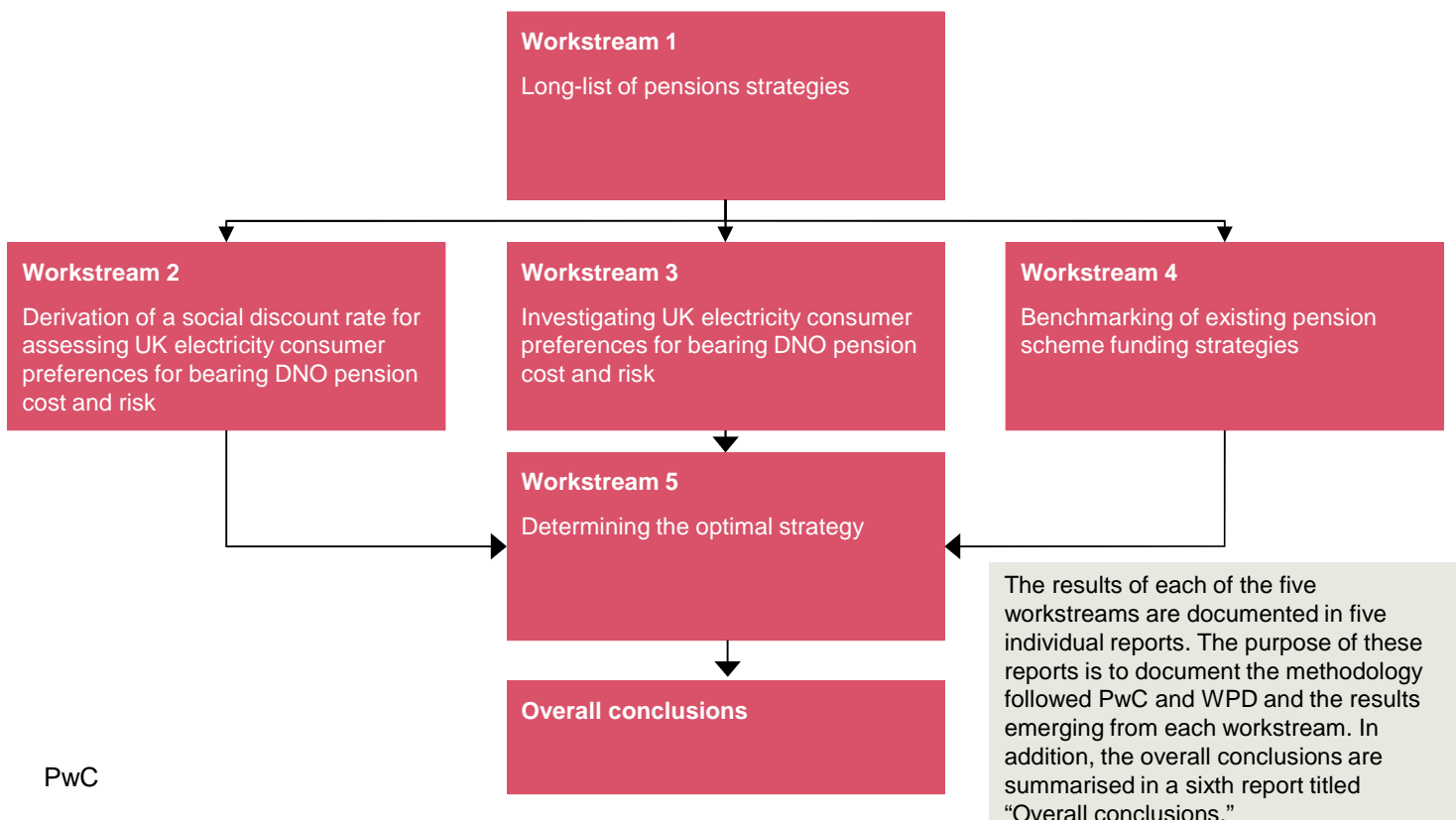
In addition the consultation document included two specific amendments to Ofgem's policy for funding network operators' pension costs (called the pension principles) as follows:

- 1 Consumers should not be expected to pay any excess costs that are avoidable by efficient management action
- 8 In light of our funding commitment, we look to employers to participate in the governance of defined benefit pension schemes with the aim of protecting the interests of the consumers who are exposed to any Established Deficit, in balance with the interest of shareholders who would be underwriting any remaining deficit. **To this end, we would look to employers to inform investment, benefit and funding strategies with objective and where possible evidence-based insights into the interests of consumers, recognising that tomorrow's consumers are as relevant as today's.** We look to employers to report transparently on their participation in the governance of these schemes.

1.2 Overview of the methodology

The methodology adopted by PwC and WPD comprised of five workstreams as follows:

Workstream	Purpose
1. Long-list of pensions strategies	<ul style="list-style-type: none"> To identify the long-list of pensions strategies which could be adopted by WPD and determine their cost and risk profile for consumers.
2. Derivation of a social discount rate for assessing UK electricity consumer preferences for bearing DNO pension cost and risk	<ul style="list-style-type: none"> To determine a discount rate using the academic research carried out to date for the purpose of comparing the relative cost (from a consumer and society perspective) of each of the pension strategies identified in Workstream 1 .
3. Investigating UK electricity consumer preferences for bearing DNO pension cost and risk	<ul style="list-style-type: none"> Use primary research techniques to: <ul style="list-style-type: none"> - Validate and inform an amendment to the social discount rate determined in Workstream 2. - Determine other relevant factors for the purpose of assessing consumers' preferred pension strategy in Workstream 1.
4. Benchmarking of existing pension scheme funding strategies	<ul style="list-style-type: none"> To provide relevant UK benchmarks for the funding of defined benefit pension schemes to provide additional validation that consumers' preferences are capable of practical implementation.
5. Determining the optimal strategy	<ul style="list-style-type: none"> To assess the long-list of pension strategies using the results of Workstreams 2, 3 and 4 in order to arrive at a pensions strategy arrived at using evidence based insights into the interests of consumers recognising that tomorrow's consumers are as relevant as today's.



1.3 Purpose of this report

The purpose of this report is to provide an assessment of each of the strategies identified in the report titled 'Long-list of pensions strategies'.

The assessment is designed to identify which of the strategies is the most efficient from a consumer and society perspective. i.e. most closely reflects consumers' (current and future generations') preferences in a number of areas including overall cost, bill variability, paying a premium in the short-term to reduce pension scheme risk (and so potential variability in the long-term) and other wider considerations such as the existence of a pension scheme deficit.

The assessment uses the results of the identification of the relevant social discount rate (see report titled 'Derivation of a social discount rate for assessing UK electricity consumer preferences for bearing DNO pension cost and risk') and the results of the primary research into consumer preferences relating to pensions cost, risk and other factors (see report titled 'Investigating UK electricity consumer preferences for bearing DNO pension cost and risk').

*Expected present
value of pension
cost element of
future bills*

2

2.1 Introduction

One of the most important considerations for assessing each of the pension strategies in the report titled 'Long-list of pension strategies' is WPD's consumers' assessment of which of the strategies has the overall lowest cost. The assessment of overall cost is performed using the social discount rate determined in the reported titled 'Derivation of a social discount rate for assessing UK electricity consumer preferences for bearing DNO pension cost and risk' with an appropriate adjustment for the relevant pensions risk premium for each of the strategies.

2.2 Assessment

The expected present value of the pension cost element of future bills is calculated by discounting the pension contributions payable (allowing for magnitude and likelihood calculated by the stochastic analysis in the report titled ‘Long-list of pensions strategies’).

The discount rates used were calculated using the social discount rate of 2.14% (source: PwC analysis – see report titled ‘Derivation of a social discount rate for assessing UK electricity consumer preferences for bearing DNO pension cost and risk’) with appropriate adjustments to reflect UK electricity consumers’ risk premiums relevant to the individual pension strategies. The calculation of the risk premiums and overall discount rates are set-out below.

Step 1: Asset class betas and calculation of asset class risk premiums

	Asset class beta	Calculated risk premium (real) ^{1 2}
Equity	1.00	4.43%
Diversified growth	1.00	4.43%
Multi-asset credit	0.50	1.93%
AA-rated corporate bonds	0.18	0.33%
A-rated corporate bonds	0.20	0.43%
Portfolio of Gilts and LDI	0.30	0.93%

¹ Risk premium calculated as (asset class beta less liability beta) multiplied by equity risk premium. Equity risk premium assumed to be 5% plus inflation (source: PwC analysis – see report titled ‘Derivation of a social discount rate for assessing UK electricity consumer preferences for bearing DNO pension cost and risk’)

² The calculated risk premiums were validated as accurate and appropriate for the purposes of assessing UK electricity preferences for bearing pension cost and risk (source: PwC analysis – see report titled ‘Derivation of a social discount rate for assessing UK electricity consumer preferences for bearing DNO pension cost and risk’)

Step 2: Example calculation of portfolio risk premium

	Portfolio asset	Risk premium (real)
Equity	50.00%	4.43%
DGF	0.00%	4.43%
Tactical credit	0.00%	1.93%
AA-rated corporate bonds	0.00%	0.33%
A-rated corporate bonds	30.00%	0.43%
LDI	20.00%	0.93%
	Portfolio risk premium	2.53%

2.2 Assessment (Cont'd)

Step 3: Asset portfolios for each strategy

Strategy	First 5 years	5 – 10 years	10-15 years	15-20 years	20+ years
1A	60% equity	30% equity	20% Gilts and LDI	75% AA rated corporate bonds	100% Gilts and LDI
1B	40% AA corporate bonds	30% AA rated corporate bonds 30% multi-asset credit 10% Gilts and LDI	40% AA rated corporate bonds 40% multi-asset credit	25% Gilts and LDI	70% AA rated corporate bonds 30% Gilts and LDI
1C	50% equity	30% equity	40% buy and maintain corporate bond portfolio	75% buy and maintain corporate bond portfolio	100% Gilts + LDI
1D	30% buy and maintain corporate bond portfolio 20% Gilts and LDI	30% buy and maintain corporate bond portfolio 20% multi-asset credit 20% Gilts and LDI	40% multi-asset credit 20% Gilts and LDI	25% Gilts and LDI	70% buy and maintain corporate bond portfolio 30% Gilts and LDI
2A	40% diversified growth			75% AA rated corporate bonds	100% Gilts + LDI
2B	40% AA-rated corporate bonds 20% Gilts and LDI			25% Gilts and LDI	70% AA-rated corporate bonds 30% Gilts and LDI
2C	40% diversified growth			75% buy and maintain corporate bond portfolio	100% Gilts + LDI
2D	40% buy and maintain corporate bond portfolio 20% Gilts and LDI			25% Gilts and LDI	70% buy and maintain corporate bond portfolio 30% Gilts and LDI
3A	75% AA rated corporate bonds				100% Gilts + LDI
3B	25% Gilts and LDI				70% AA rated corporate bonds 30% Gilts and LDI
3C	75% Buy and maintain corporate bond portfolio				100% Gilts + LDI
3D	25% Gilts and LDI				70% Buy and maintain corporate bond portfolio 30% Gilts and LDI
4A	25% equity				
4B	10% diversified growth 15% multi-asset credit 10% AA rated corporate bonds 40% Gilts and LDI				
5A	100% cashflow matched				
5B	Insurance company annuities				

2.2 Assessment (Cont'd)

Step 4: Risk premiums for each strategy

Strategy	First 5 years	5 – 10 years	10-15 years	15-20 years	20+ years
1A	2.79%	2.10%	1.09%	0.48%	0.93%
1B					0.51%
1C	2.53%	2.03%	1.13%	0.56%	0.93%
1D					0.58%
2A		2.09%		0.48%	0.93%
2B					0.51%
2C		2.13%		0.56%	0.93%
2D					0.58%
3A			0.48%		0.93%
3B					0.51%
3C			0.56%		0.93%
3D					0.58%
4A			2.25%		
4B					
5A			0.93%		
5B			n/a		

2.2 Assessment (Cont'd)

Step 5: Discount rate used to discount the pension cost element of future electricity bills ^{3 4}

Strategy	First 5 years	5 – 10 years	10-15 years	15-20 years	20+ years
1A	(0.65)%	0.04%	1.05%	1.66%	1.21%
1B					1.63%
1C	(0.39)%	0.11%	1.01%	1.58%	1.21%
1D					1.56%
2A		0.05%		1.66%	1.21%
2B					1.63%
2C		0.01%		1.58%	1.21%
2D					1.56%
3A			1.66%		1.21%
3B					1.63%
3C			1.58%		1.21%
3D					1.56%
4A			(0.11)%		
4B					
5A			1.21%		
5B			n/a		

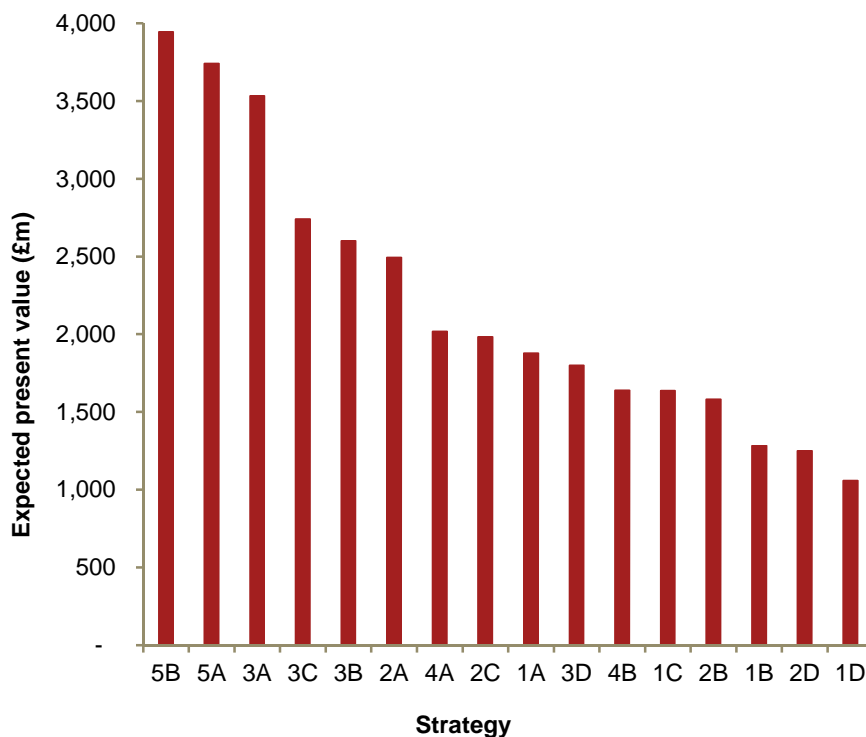
³ Calculated as social discount rate less portfolio risk premium. Social discount rate (real) used is 2.14% (source: PwC analysis – see report titled 'Derivation of a social discount rate for assessing UK electricity consumer preferences for bearing DNO pension cost and risk')

⁴ When discounting future consumer bills, a riskier bill profile will be reflected as an increase in effective cost (i.e. additional risk represents additional cost). Therefore the portfolio risk premium is used to reduce the social discount rate

2.2 Assessment (Cont'd)

Step 6: Expected present value of pension cost element of future bills

Strategy	Expected present value (£m)
1A	1,877
1B	1,283
1C	1,636
1D	1,058
2A	2,494
2B	1,581
2C	1,982
2D	1,248
3A	3,532
3B	2,601
3C	2,739
3D	1,799
4A	2,017
4B	1,639
5A	3,741
5B	3,944



³ Expected present value calculated by discounting the pension cost element of future electricity bills. Pension cost element of future electricity bills take from PwC analysis (source: PwC analysis – see report titled ‘Long-list of pensions Strategies’). Discount rates are set-out in Step 5 above

*Variability in
future bills due to
pension costs*

3

3.1. Introduction

While the main determinant of the most efficient strategy from WPD's consumers' perspective is the overall cost (calculated in Section 3), the present value may mask the fact that strategies with a lower overall cost may have year on year variability outside of consumer tolerances (based on the preferences discovered in the report titled 'Investigating UK electricity consumer preferences for bearing DNO pension cost and risk').

Therefore, each of the pension strategies is assessed from a potential year on year variability perspective and the impact on consumer bills. The assessment then uses the consumer tolerance for bill variability identified in Section 4 of the report titled 'Investigating UK electricity consumer preferences for bearing DNO pension cost and risk'.

3.2 Assessment

The assessment of overall cost of each strategy (see Section 2) incorporates an allowance for the variability in costs within each strategy through the expected present value of costs calculation. However, as an additional validation, the potential variability of costs arising from each strategy was also assessed against the degree of acceptability to consumers.

The assessment is set-out below:

Step 1: Calculate range of costs which the pensions element of future bills will lie within

Pension contributions arising under the 5th percentile for each strategy (source: PwC analysis – see report titled ‘Long-list of pensions strategies’)

	Year																																															
Strategy	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40								
1A	140	140	140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
1B	113	113	113	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1C	140	140	140	20	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
1D	113	113	113	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
2A	161	161	161	104	104	104	36	36	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
2B	132	132	132	46	46	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2C	161	161	161	84	84	84	17	17	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2D	132	132	132	36	36	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
3A	212	212	212	169	169	169	125	125	125	41	41	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
3B	181	181	181	109	109	109	39	39	39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3C	212	212	212	155	155	155	125	125	125	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3D	181	181	181	112	112	112	66	66	66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4A	193	193	193	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4B	162	162	162	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5A	261	261	261	261	261	261	248	248	248	155	155	155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5B	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

3.2 Assessment (Cont'd)

Pension contributions arising under the 95th percentile for each strategy (source: PwC analysis – see report titled ‘Long-list of pensions strategies’)

	Year																																																	
Strategy	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40										
1A	140	140	140	143	143	143	144	144	144	153	153	153	144	144	144	144	144	144	144	144	129	129	129	129	129	129	129	129	129	129	120	120	120	120	120	120	120	120	120	120	120									
1B	113	113	113	133	133	133	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138						
1C	140	140	140	140	140	140	142	142	142	149	149	149	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142					
1D	113	113	113	120	120	120	122	122	122	122	122	122	113	113	113	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111				
2A	161	161	161	161	161	161	161	161	161	161	161	161	161	147	147	147	147	147	147	147	147	147	147	147	147	147	147	147	147	147	147	147	147	147	147	147	147	147	147	147	147	147	147	147	147	147				
2B	132	132	132	132	132	132	132	132	132	132	132	132	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110		
2C	161	161	161	161	161	161	161	161	161	161	161	161	161	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149		
2D	132	132	132	132	132	132	132	132	132	132	132	132	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97		
3A	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212		
3B	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	
3C	212	212	212	212	212	212	212	212	212	212	212	212	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	
3D	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	181	
4A	193	193	193	193	193	193	193	193	193	193	193	193	146	146	146	146	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	
4B	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104
5A	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	
5B	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	

3.2 Assessment (Cont'd)

Range of costs (calculated as half of the difference between 5th percentile and 95th percentile outcomes)

Strategy	Year																																													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40						
1A	0	0	0	71	71	71	72	72	72	77	77	77	72	72	72	72	72	72	72	72	72	64	64	64	64	64	64	64	64	64	60	60	60	60	60	60	60	60	60	60	60	60				
1B	0	0	0	66	66	66	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	39	39	39	39	39	39	39	39	39	39	32	32	32	32	32	32	32	32	32	32	32	32	32		
1C	0	0	0	60	60	60	71	71	71	75	75	75	71	71	71	71	71	71	71	71	71	36	36	36	36	36	36	36	36	36	21	21	21	21	21	21	21	21	21	21	21	21	21	21		
1D	0	0	0	60	60	60	61	61	61	61	61	61	56	56	56	56	56	56	56	56	56	13	13	13	14	14	14	14	14	14	14	7	7	7	7	8	8	8	8	8	8	8	8	8		
2A	0	0	0	28	28	28	63	63	63	80	80	80	74	74	74	74	74	74	74	74	74	64	64	64	71	71	71	78	78	78	83	83	83	83	87	87	87	89	89	89	89	89	89	89		
2B	0	0	0	43	43	43	66	66	66	66	66	66	55	55	55	55	55	55	55	55	55	33	33	33	33	33	33	34	34	34	37	37	37	37	40	40	40	45	45	45	45	45	45	45		
2C	0	0	0	38	38	38	72	72	72	80	80	80	75	75	75	75	75	75	75	75	75	21	21	21	21	21	21	21	21	21	18	18	18	18	18	18	18	18	18	19	19	19	19	19		
2D	0	0	0	48	48	48	66	66	66	66	66	66	49	49	49	49	49	49	49	49	49	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5	5	5	5	6	
3A	0	0	0	21	21	21	43	43	43	85	85	85	106	106	106	106	106	106	106	106	106	125	125	125	140	140	140	152	152	152	158	158	158	158	161	161	161	161	161	161	171	171	171	171	171	
3B	0	0	0	36	36	36	71	71	71	90	90	90	88	88	88	88	88	88	88	88	88	92	92	92	101	101	101	106	106	106	118	118	118	118	126	126	126	139	139	139	142	142	142	142	142	
3C	0	0	0	28	28	28	43	43	43	65	65	65	80	80	80	80	80	80	80	80	80	27	27	27	27	27	27	27	27	27	31	31	31	31	34	34	34	34	34	37	37	37	37	37	37	
3D	0	0	0	34	34	34	57	57	57	90	90	90	48	48	48	48	48	48	48	48	48	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
4A	0	0	0	96	96	96	96	96	96	73	73	73	52	52	52	52	52	52	52	52	37	37	37	19	19	19	19	19	19	18	18	18	16	16	16	16	16	16	16	16	15	15	15	15	15	
4B	0	0	0	79	79	79	81	81	81	81	81	81	52	52	52	52	52	52	52	52	20	20	20	20	20	20	20	20	20	20	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	
5A	0	0	0	0	0	0	6	6	6	53	53	53	17	17	17	35	35	35	56	56	56	75	75	75	96	96	96	105	105	105	110	110	110	110	120	120	120	127	127	127	129	129	129	129	129	
5B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Step 2: Determine consumer acceptability preferences

Consumer acceptability relating to variability (source: PwC analysis – ‘Investigating UK electricity consumer preferences for bearing DNO pension cost and risk’)

Average acceptable level of bill variability	5% of DNO costs (equivalent to around £5)
Acceptable level of bill variability for the majority ⁶ of consumers	10% of DNO costs (equivalent to around £10)

⁶ The analysis found that 33% of consumers (average across domestic and business consumers) would deem bill variability in excess of 10% as not acceptable

3.2 Assessment (Cont'd)

Step 3: Convert pension cost variability into a cost per consumer and assess against consumer acceptability preferences

Strategy	Year																																											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40				
1A	0	0	0	9	9	9	9	9	9	10	10	10	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8			
1B	0	0	0	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4		
1C	0	0	0	8	8	8	9	9	9	10	10	10	9	9	9	9	9	9	9	9	9	5	5	5	5	5	5	5	5	5	3	3	3	3	3	3	3	3	3	3	3	3	3	
1D	0	0	0	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	7	7	7	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1		
2A	0	0	0	4	4	4	8	8	8	10	10	10	9	9	9	9	9	9	9	9	9	8	8	8	9	9	9	10	10	10	11	11	11	11	11	11	11	11	11	11	11	11	11	
2B	0	0	0	6	6	6	8	8	8	8	8	8	7	7	7	7	7	7	7	7	7	4	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	5	5	6	6	6	7	
2C	0	0	0	5	5	5	9	9	9	10	10	10	10	10	10	10	10	10	10	10	10	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	
2D	0	0	0	6	6	6	8	8	8	8	8	8	6	6	6	6	6	6	6	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3A	0	0	0	3	3	3	6	6	6	11	11	11	14	14	14	14	14	14	14	14	16	16	16	18	18	18	19	19	19	20	20	20	21	21	21	22	22	22	22	22	22	22		
3B	0	0	0	5	5	5	9	9	9	12	12	12	11	11	11	11	11	11	11	11	12	12	12	13	13	13	14	14	14	15	15	15	16	16	16	16	18	18	18	18	18	18	18	
3C	0	0	0	4	4	4	6	6	6	8	8	8	10	10	10	10	10	10	10	10	3	3	3	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	5	5	5	6	6	6
3D	0	0	0	4	4	4	7	7	7	12	12	12	6	6	6	6	6	6	6	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
4A	0	0	0	12	12	12	12	12	12	9	9	9	7	7	7	7	7	7	7	5	5	5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
4B	0	0	0	10	10	10	10	10	10	10	10	10	7	7	7	7	7	7	7	7	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
5A	0	0	0	0	0	0	1	1	1	7	7	7	2	2	2	4	4	4	4	7	7	7	10	10	10	12	12	12	14	14	14	14	14	14	14	15	15	15	16	16	16	17	17	
5B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

- Pension cost variability per consumer calculated as range of costs divided by number of WPD consumers (c.7.8m)
- Assessment criteria as follows:

Variability of costs acceptable to all consumers on average	Less than +/- £5 per bill payer	
Variability of costs acceptable to the majority of consumers	Between £5 and £10 per bill payer	
Variability of costs not acceptable to the majority of consumers	Greater than +/- £10 per bill payer	

3.2 Assessment (Cont'd)

Step 4: Conclusions

Strategy	Overall result	
1A	Variability of costs not acceptable to consumers	●
1B	Variability of costs acceptable to the majority of consumers	●
1C	Variability of costs not acceptable to consumers	●
1D	Variability of costs acceptable to the majority of consumers	●
2A	Variability of costs not acceptable to consumers	●
2B	Variability of costs acceptable to the majority of consumers	●
2C	Variability of costs not acceptable to consumers	●
2D	Variability of costs acceptable to the majority of consumers	●
3A	Variability of costs not acceptable to consumers	●
3B	Variability of costs not acceptable to consumers	●
3C	Variability of costs not acceptable to consumers	●
3D	Variability of costs not acceptable to consumers	●
4A	Variability of costs not acceptable to consumers	●
4B	Variability of costs not acceptable to consumers	●
5A	Variability of costs not acceptable to consumers	●
5B	Variability of costs acceptable to all consumers on average	●

*Immediate cost
increase to remove
future volatility*

4

4.1. Introduction

While the main determinant of the most efficient strategy from WPD's consumers' perspective is the overall cost (calculated in Section 3), the present value may mask the fact that under some strategies there may be short-term cost increases relative to other strategies.

The short-term (e.g. the first ten years) costs under each of the strategies is determined at the 2016 actuarial valuation and the costs are predominantly influenced by the strategies adopted. Specifically, those strategies which have a higher degree of near term pension scheme de-risking (e.g. strategies 2A-D, 3A-D, 5A-B) have significant short-term increases in contributions compared to those which have less short-term de-risking (1A-1D, 4A-B).

De-risking adopted by pension schemes tends to result in higher short-term costs in return for lower costs (and cost variability) in future years.

The consumer preference research indicated strongly that consumers were not willing to pay significant increases in short-term costs for the benefit of future generations. This is also validated by the level of the social discount rate and this effect also emerges in the present value calculation for the various pensions strategies (calculated in Section 2).

Therefore, pensions strategies which have a lower short term cost increase are ranked more highly than strategies which have a higher short-term cost increase.

4.2 Assessment

Table below shows the deficit contributions for the 2016 actuarial valuation which would result under each strategy.

Strategy	Deficit contributions ⁷ (calculated at 31 December 2015) (£m p.a. RPI-linked)	Deficit contribution from 2016 valuation ⁸ (£m p.a. RPI-linked)	Element of deficit contributions to be included in electricity bills (assumes regulatory fraction of c.81%)	Increase/ (decrease) relative to element ⁹ included in 2016/17 bills (£m p.a.)	Cost increase/ (decrease) per consumer (£)	Ranking (lowest equals most favourable)
1A	140	181	147	21	2.7	6/16
1B	113	152	123	(3)	(0.4)	2/16
1C	140	181	147	21	2.7	5/16
1D	113	152	123	(3)	(0.4)	1/16
2A	161	206	167	41	5.2	8/16
2B	132	175	142	16	2.0	4/16
2C	161	206	167	41	5.2	7/16
2D	132	175	142	16	2.0	3/16
3A	212	265	214	88	11.3	14/16
3B	181	232	188	62	7.9	11/16
3C	212	265	214	88	11.3	13/16
3D	181	232	188	62	7.9	10/16
4A	193	248	201	75	9.6	12/16
4B	162	207	168	42	5.3	9/16
5A	261	323	262	136	17.4	15/16
5B	275	341	276	150	19.2	16/16

⁶. Source: see report titled 'Long-list of pensions strategies'

⁷. Source: see Appendix 6 of the report titled "Long-list of pensions strategies".

⁸. Pension cost element included in 2016/17 bills c.£125m p.a.

Existence of a pensions deficit

5

5.1. Introduction

While the main determinant of the most efficient strategy from WPD's consumers' perspective is the overall cost (calculated in Section 3), the present value may mask the fact that under some strategies a deficit may remain for a longer period of time than under other strategies.

The results of the research into consumer preferences revealed that the existence of a pensions deficit is not a major concern to consumers with only one-third of consumers indicating that it would be important to them that the DNO had no pensions deficit.

Therefore, while the results of this assessment are useful, they will attract a lower priority in the overall assessment.

5.2 Assessment

The table below shows how long a pensions deficit is likely to exist.

Strategy	Average expected time ¹⁰ for the deficit to be removed (years)	Median time ¹¹ for deficit to be removed (years)	Ranking (lowest equals most favourable)
1A	23	13	11/16
1B	18	10	5/16
1C	20	13	8/16
1D	15	10	2/16
2A	25	13	14/16
2B	20	13	9/16
2C	25	13	12/16
2D	12	10	1/16
3A	34	50	16/16
3B	25	13	13/16
3C	29	13	15/16
3D	21	13	10/16
4A	18	10	6/16
4B	19	13	7/16
5A	15	15	4/16
5B	15	15	3/16

¹⁰. Source: PwC analysis – see report titled ‘Long-list of pensions strategies’. Average expected time taken from the average of the time period under each 10th percentile outcome

¹¹. Source: PwC analysis – see report titled ‘Long-list of pensions strategies’

*Comparison with
practice of other UK
pension schemes*

6

6.1 Introduction

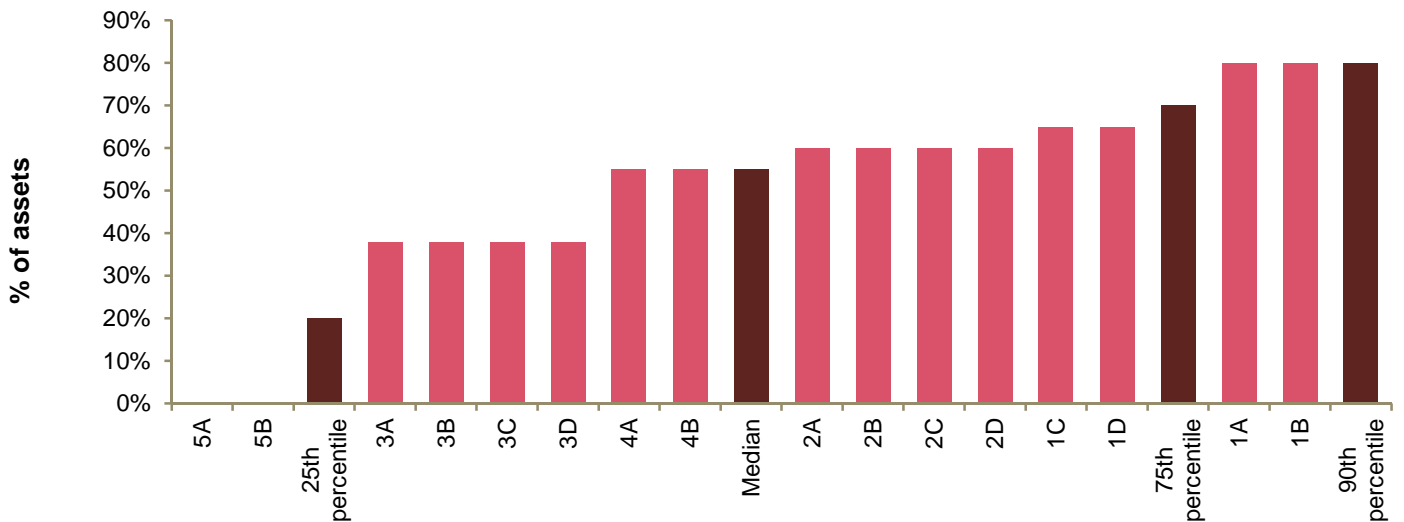
The purpose of the overall exercise is to determine the most efficient pension strategy after reflecting consumers' preferences. Given that this is the first time that an exercise of this type may have been conducted, the strategy may not necessarily adhere to UK norms. This in itself is not necessarily a constraint, however, if the optimal strategy is outside of UK norms then further investigation may be warranted to explain the difference.

Therefore, each of the strategies is assessed against UK norms and if the optimal strategy appears to be outside of UK norms then further analysis will be conducted to inform implementation given the other stakeholders involved (e.g. the Pensions Regulator and pension scheme trustees).

6.2 Assessment

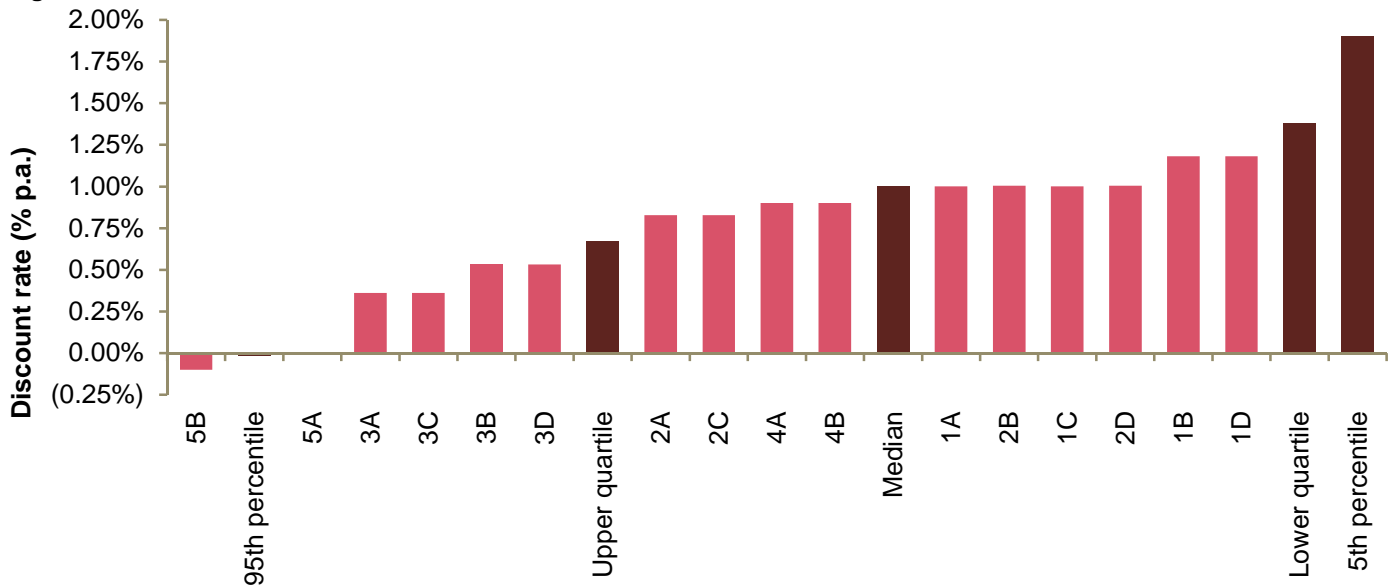
A comparison of the pension strategies against those of other UK pension schemes is set-out in the following charts. See report titled 'Benchmarking of existing pension scheme funding strategies' for more detail on the construction of the charts.

Figure 1



Source: 'Scheme Funding Statistics' (May 2015) published by the Pensions Regulator (survey of c.6,000 UK defined benefit pension schemes). The chart shows data from Tranche 8 of the survey. For this purpose growth assets include the following asset classes: equities, property, commodities, hedge funds, below investment grade corporate bonds and any other assets reported to the Pensions Regulator as type 'other'

Figure 2

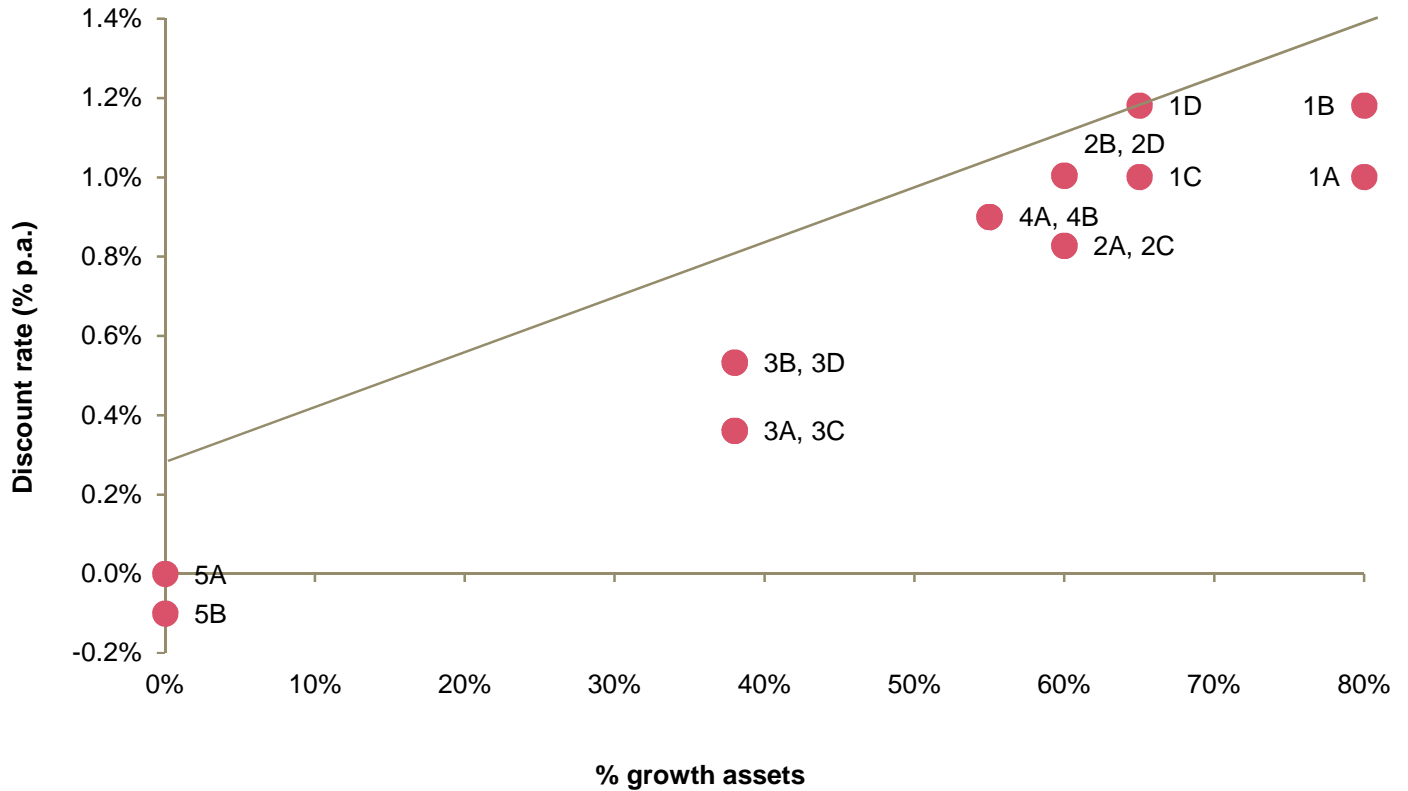


Source: 'Scheme Funding Statistics' (May 2015) published by the Pensions Regulator (survey of c.6,000 UK defined benefit pension schemes). The chart shows data from Tranche 8 of the survey. To produce this data, the Pensions Regulator has converted the discount rates used by pension schemes into an average discount rate which applies over the lifetime of the pension scheme (a 'single equivalent discount rate'). To enable a like-for-like comparison, the discount rates for the WPD schemes have also been converted to a single equivalent discount rate.

6.2 Assessment (Cont'd)

A comparison of the pension strategies against those of other UK pension schemes is set-out in the following charts. See report titled 'Benchmarking of existing pension scheme funding strategies' for more detail on the construction of the charts.

Figure 3



Source: 'Scheme Funding Statistics' (May 2015) published by the Pensions Regulator (survey of c.6,000 UK defined benefit pension schemes). This chart has been produced by plotting a line of best fit through the data in Tranche 8 of the survey

6.2 Assessment (Cont'd)

Strategy	Proportion invested in growth assets (Figure 1) (Inside/outside inter-quartile range of UK pension schemes)	Discount rates used in calculation of Technical Provisions (Figure 2) (Inside/outside inter-quartile range of UK pension schemes)	Comparison of discount rates and % invested in growth assets (Figure 3)	Overall summary – Strategy significantly within UK norms (yes/no)
1A	● Outside	● Inside	● Appropriate	● No
1B	● Outside	● Inside	● Appropriate	● No
1C	● Inside	● Inside	● Appropriate	● Yes
1D	● Inside	● Inside	● Appropriate	● Yes
2A	● Inside	● Inside	● Appropriate	● Yes
2B	● Inside	● Inside	● Appropriate	● Yes
2C	● Inside	● Inside	● Appropriate	● Yes
2D	● Inside	● Inside	● Appropriate	● Yes
3A	● Inside	● Outside	● Appropriate	● No
3B	● Inside	● Outside	● Appropriate	● No
3C	● Inside	● Outside	● Appropriate	● No
3D	● Inside	● Outside	● Appropriate	● No
4A	● Inside	● Inside	● Appropriate	● Yes
4B	● Inside	● Inside	● Appropriate	● Yes
5A	● Inside	● Outside	● Appropriate	● No
5B	● Inside	● Outside	● Appropriate	● No

*Trapped surplus
largely paid for by
consumers*



7.1. *Introduction*

Generally, any surplus that arises in a pension scheme is difficult to return to the DNO (in order to reduce future consumer bills).

A surplus can arise in a pension scheme as a result of two main factors:

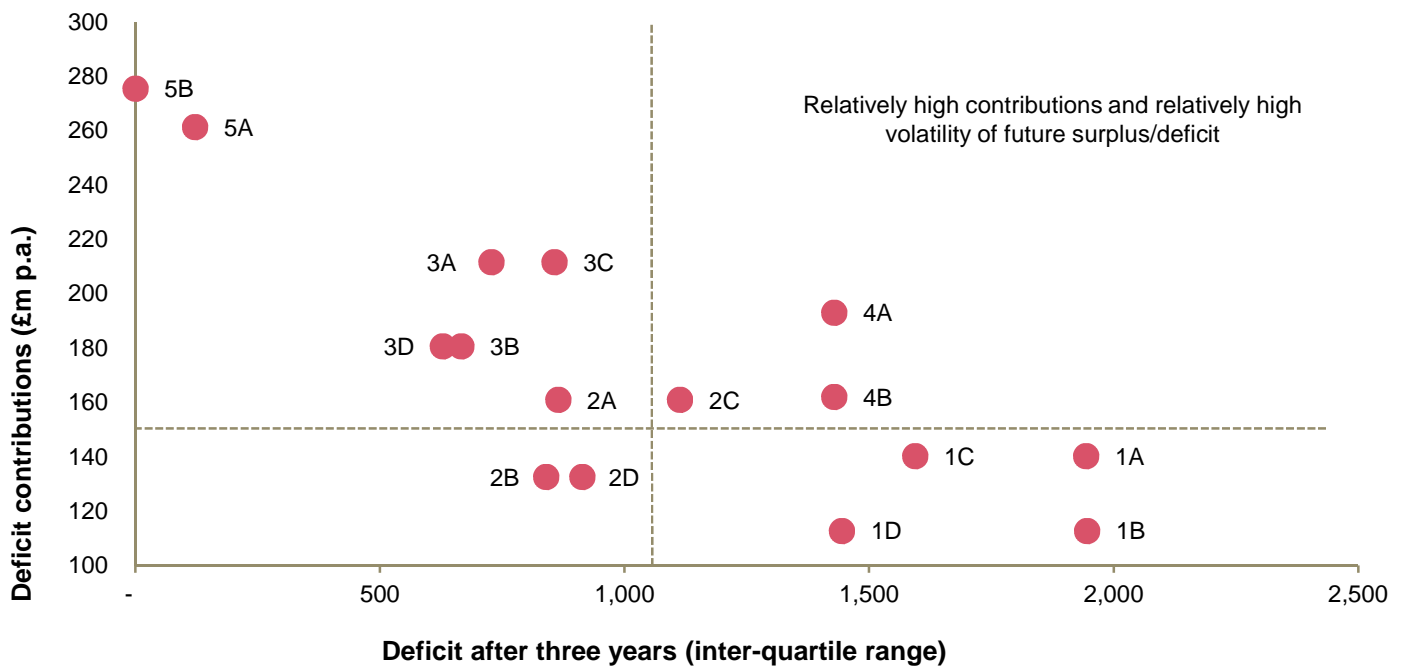
- High deficit contributions; and/or
- Investment returns in excess of those typically expected.

Therefore from a consumer perspective, strategies in which surpluses emerge following a period of high deficit contributions could be considered low from a consumer acceptability perspective.

Each of the pensions strategies is assessed against this criteria.

7.2 Assessment

The chart below shows a comparison of the contributions paid for each strategy from the 2016 valuation compared with the potential range of outcomes for surplus/deficit after three years. The strategies in the top right quadrant would be ranked lower in terms of consumer acceptability due to the potential for trapped surplus after a period of high contributions.



Source: PwC analysis – data in chart taken from analysis in report titled ‘Long-list of pensions strategies’.

Summary

Strategy	Overall result	Acceptability
1A	-	Green
1B	-	Green
1C	-	Green
1D	-	Green
2A	-	Green
2B	-	Green
2C	Low acceptability	Red
2D	-	Green
3A	-	Green
3B	-	Green
3C	-	Green
3D	-	Green
4A	Low acceptability	Red
4B	Low acceptability	Red
5A	-	Green
5B	-	Green

Overall summary of scoring assessment

8

8. Overall summary of scoring assessment

A summary of the scoring assessments from 2 to 7 is set-out in the following table.

The most efficient from a consumer perspective is strategy 1D. See report titled 'Overall conclusions' for a full summary of all conclusions.

Strategy	Overall costs	Variability in future bills due to pension costs	Cost increase to remove future volatility	DNO has a pensions deficit	Compare with typical practice of other pension schemes (within UK norms)	Trapped surplus largely paid for by consumers
1A	1,877	Not acceptable	6/16	11/16	Outside UK norms	
1B	1,283	Acceptable to majority	2/16	5/16	Outside UK norms	
1C	1,636	Not acceptable	5/16	8/16	Inside UK norms	
1D	1,058	Acceptable to majority	1/16	2/16	Inside UK norms	
2A	2,494	Not acceptable	8/16	14/16	Inside UK norms	
2B	1,581	Acceptable to majority	4/16	9/16	Inside UK norms	
2C	1,982	Not acceptable	7/16	12/16	Inside UK norms	Low acceptability
2D	1,248	Acceptable to majority	3/16	1/16	Inside UK norms	
3A	3,532	Not acceptable	14/16	16/16	Outside UK norms	
3B	2,601	Not acceptable	11/16	13/16	Outside UK norms	
3C	2,739	Not acceptable	13/16	15/16	Outside UK norms	
3D	1,799	Not acceptable	10/16	10/16	Outside UK norms	
4A	2,017	Not acceptable	12/16	6/16	Inside UK norms	Low acceptability
4B	1,639	Not acceptable	9/16	7/16	Inside UK norms	Low acceptability
5A	3,741	Not acceptable	15/16	4/16	Outside UK norms	
5B	3,944	Acceptable	16/16	3/16	Outside UK norms	

This document has been prepared only for Western Power Distribution and solely for the purpose and on the terms agreed with Western Power Distribution in our agreement dated 18 September 2015. We accept no liability (including for negligence) to anyone else in connection with this document.

© 2016 PricewaterhouseCoopers LLP. All rights reserved. In this document, "PwC" refers to the UK member firm, and may sometimes refer to the PwC network. Each member firm is a separate legal entity. Please see www.pwc.com/structure for further details.