Government Actuary's Department

Armed Forces Pension Scheme

Actuarial valuation as at 31 March 2016
Report by the Scheme Actuary

Date: 28 February 2019

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Contents

1 Executive summary

This report is addressed to the Secretary of State for Defence and provides the results of the actuarial valuation of the Armed Forces Pension Scheme carried out as at 31 March 2016.

1.1 This report sets out the results of the actuarial valuation of the combination of the pre-2015 Schemes and the 2015 Scheme ('the aggregate scheme') as at 31 March 2016, as required by Directions. It has been prepared following the Government's decision to pause the operation of the cost control mechanisms pending the outcome of its appeal of a Court of Appeal judgment (see paragraphs 1.3 and 1.4 for details) and to implement employer contribution rates from 1 April 2019 as if the cost control mechanisms had not been paused. This report accordingly shows the results for the ***uncorrected employer contribution rate*** and the ***corrected employer contribution rate*** (both terms from the Directions). The latter represents the contribution rate required to meet the employers' share of the cost of accrual and past service costs, except that the calculation assumes that the accrual rate in the 2015 Scheme has been adjusted from 1 April 2019 to the extent necessary for the ***employer contribution correction cost*** to be equal to the ***target cost of the scheme***[1].

1.2 The purpose of this report is to state the results of the valuation based on the data, method and assumptions described in this report. The action required as a consequence of these results is set out in paragraph 1.6.

1.3 When the 2015 schemes were introduced, the transitional protections determined which members remained in the pre-2015 schemes (generally older members) and which joined the 2015 schemes (generally younger members). Claims of age discrimination have been brought in relation to the terms of transitional protection by groups of firefighters and members of the Judiciary ('the McCloud/Sargeant case'). The Court of Appeal provided a judgment that there has been unlawful discrimination in these cases on 20 December 2018. The Government has sought permission to appeal the ruling. The implications of the judgment (if any) are unclear at this stage. Please note that, should the ruling stand, we anticipate that there would be read-across to all public sector schemes. This would likely result in a requirement to compensate certain members for any discrimination suffered as a result of the transitional protections.

1.4 In her written ministerial statement[2] ('WMS') made on 30 January 2019 the Chief Secretary to the Treasury announced that there would be a pause to the cost cap process until there is certainty about the value of pensions to employees from April 2015 onwards. In his letter to the Government Actuary dated 13 February 2019, the Director of Public Spending explained that Government's policy is for employer contribution rates to be implemented as if the cost cap process had not been paused. The WMS confirmed that, should the Court of Appeal's ruling in the

[1] The target cost of the scheme is equal to the ***proposed employer cost cap***.

[2] https://www.parliament.uk/business/publications/written-questions-answers-statements/written-statement/Commons/2019-01-30/HCWS1286/

McCloud/Sargeant case be overturned, the cost cap mechanism will be resumed and any consequent changes in the 2015 Scheme would be implemented as planned.

1.5 The key results of the valuation are as follows:

> ***Uncorrected employer contribution rate*** *effective over the* ***implementation period****: 59.4% of pensionable pay. This is an increase of 9.0% on the current contribution rate. This increase is primarily due to the reduction in the SCAPE discount rate to 2.4% pa above CPI with effect from 1 April 2019.*

> ***Corrected employer contribution rate*** *payable over the* ***implementation period****: 63.5% of pensionable pay. This is an increase of 13.1% on the current contribution rate. This rate is calculated in the same way as the* ***uncorrected employer contribution rate*** *except that the accrual rate of the 2015 Scheme is assumed to be improved from 1 April 2019 to the extent necessary such that the* ***employer contribution correction cost*** equals the ***target cost of the scheme***.

1.6 The next step is as follows:

> The Scheme Manager needs to make arrangements for implementing a revised employer contribution rate from 1 April 2019.

1.7 The results in this report have been prepared in accordance with the benefits set out in the scheme regulations and under the approach specified in the Directions, as they apply at the date of signing. The assumptions were considered and set by the Secretary of State for Defence prior to the ruling mentioned in paragraph 1.3 and remain appropriate should the benefits taken into account remain unchanged. Should the ruling mentioned in paragraph 1.3 be upheld, the assumptions may become inappropriate. In this scenario, a valuation prepared in accordance with the revised benefits (mentioned in paragraph 1.3) and suitably revised assumptions would yield different results than those contained in this report. However, as there remains uncertainty as to the success of the appeal application and any amendments that would need to be made, we have not made any attempt to quantify the potential impact.

2 Key points from the valuation

*This chapter provides the **valuation results** as required by the Directions, along with some commentary about the background, data and assumptions used and the changes from the previous valuation.*

Introduction

2.1 This report sets out the results of the actuarial valuation of the combination of the Armed Forces Pension Scheme 1975, the Armed Forces Pension Scheme 2005 and other predecessor schemes (collectively the "pre 2015 Schemes")[3] and the Armed Forces Pension Scheme 2015 ("2015 Scheme")[4]. This combination is referred to as the Armed Forces Pension Scheme or 'the Scheme'. The Scheme provides pensions and other benefits to members of the Armed Forces. The Scheme is an unfunded statutory public service pension scheme with the benefits underwritten by the Government. The Scheme is financed by payments from the employer. The rate of employer contributions is typically set following an actuarial valuation and it covers the cost of accrual of future benefits with adjustment, as necessary, to target the funding objective of being 100% funded (notionally). The previous valuation of the Scheme was carried out as at 31 March 2012 and this recommended an ***employer contribution rate*** of 50.4% of pensionable pay.

2.2 GAD has been appointed as ***scheme actuary*** by the Secretary of State for Defence to carry out an actuarial valuation of the Armed Forces Pension Scheme as at 31 March 2016 (the ***effective date***), as required by Regulation 113 of The Armed Forces Pension Regulations 2014 (SI 2014/2336). This report on the valuation is addressed to the Secretary of State for Defence.

2.3 The valuation has been undertaken in accordance with *The Public Service Pensions (Valuations and Employer Cost Cap) Directions 2014 (as amended)* ('the Directions'). Terms defined in the Directions are shown in ***bold italics*** when used in this report.

2.4 The Directions specify a number of assumptions, including the use of the ***SCAPE discount rate***. In our opinion the directed assumptions are reasonable to use for the valuation as they meet the Government's policy objectives. The Government Actuary has separately been consulted on the directed assumptions by HM Treasury. The consultation materials can be found online[5].

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[3] The schemes are established and governed by Regulations relating to predecessor schemes (listed in Schedule 1 of the valuation Directions)

[4] The scheme is established and governed by SI 2014/2336

[5] The Government Actuary's response to a consultation on amendments to the Directions can be found at the following link: https://www.gov.uk/government/publications/public-service-pensions-actuarial-valuations

2.5 The main purpose of the valuation is set out in the Directions. This is to determine the ***uncorrected employer contribution rate*** and the ***corrected employer contribution rate*** effective from 1 April 2019 (the ***implementation date***) for the four year period from 1 April 2019 (the ***implementation period***). Paragraph 22 of the Directions requires a number of results relating to the liabilities, ***notional assets*** and contribution rates to be prepared and reported. Appendix G sets out where all information as required by the Directions is provided in this ***valuation report*** (or related advice listed in paragraph 2.6).

2.6 We have separately provided advice and information on data and assumptions to be used for this valuation. The following documents should be read in conjunction with this report.

> Armed Forces Pension Scheme: Actuarial valuation as at 31 March 2016: Report on data as at 31 March 2016 with today's date ('the Data report')

> Armed Forces Pension Scheme: Actuarial valuation as at 31 March 2016: Advice on assumptions with today's date ('the Assumptions report')

2.7 Please see Appendix I for the limitations of this report.

Data and assumptions

2.8 Data was received from Defence Business Services (DBS) for the 2016 valuation. This was generally reasonable for the purposes of the valuation calculations. However, some aspects of the data were incomplete and/or unreliable for certain elements of our valuation calculations.

2.9 It has not been possible to fully resolve these data issues in the timescale required for the valuation. Therefore, to calculate results for the 2016 valuation of the Scheme requires assumptions in respect of incomplete and/or unreliable individual member records and movements data. The latter is used for setting assumptions and in the calculation of the ***cost cap net leavers liability*** ('CCNLL') which has an impact on the ***employer contribution correction cost***. The Assumptions report contains full details of the approaches taken in respect of missing and unreliable data. Appendix D contains more details regarding the estimation of the CCNLL.

2.10 To accurately calculate the CCNLL in accordance with the Directions requires full movement data for all members who were active in 2015 and are no longer active at the 2016 valuation. The data available was not suitable for calculating the CCNLL and it was not possible to make assumptions to adjust the data available to provide for a reasonable estimate of the CCNLL to be calculated. In particular, it was not possible to match members in the 2015 and 2016 data. Further details on the approach taken to determining the CCNLL in the absence of fully complete data is provided in the Assumptions report.

2.11 For the 2016 valuation, the CCNLL calculation period is only one year, rather than a full four-year ***inter-valuation period***. Given the short period over which any gain or loss may have arisen it might reasonably be concluded that the lack of data for the CCNLL calculation is not critical for this valuation although it would become so in future valuations when a longer ***inter-valuation period*** is considered.

2.12 Because the data issues identified could affect employer contribution rates, and also member benefits via the cost cap mechanism, we recommend that MoD continues its ongoing programme to improve valuation data quality.

Employer contribution rate

2.13 The results in this report have been prepared in accordance with the benefits set out in the scheme regulations and under the approach specified in the Directions, as they apply at the date of signing.

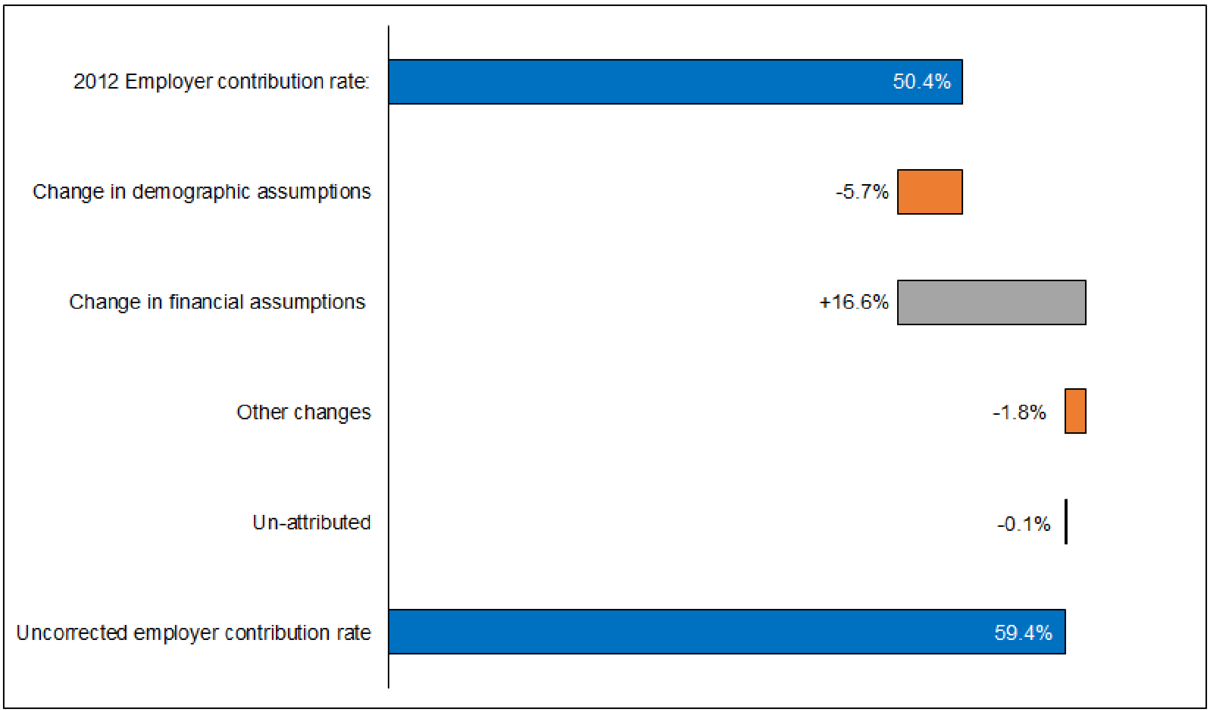
2.14 The Directions require two separate measures of employer contribution rate to be calculated and disclosed.

- The ***uncorrected employer contribution rate*** effective over the ***implementation period*** (1 April 2019 to 31 March 2023) is 59.4% of pensionable pay. This represents the cost of accrual over the ***implementation period*** based on the scheme's current regulations plus an allowance for correcting any surplus or deficit in the scheme.

- The ***corrected employer contribution rate*** effective over the ***implementation period*** (1 April 2019 to 31 March 2023) is 63.5% of pensionable pay. This rate is calculated in the same way as the ***uncorrected employer contribution rate*** except that the accrual rate of the 2015 Scheme is assumed to be improved from 1 April 2019 to the extent necessary such that the ***employer contribution correction cost*** equals the ***target cost of the scheme***.

2.15 Chart 2.1 summarises the key reasons for the difference between the ***uncorrected employer contribution rate*** compared to the employer contribution rate determined at the previous valuation. Further explanation of the change is provided in section 3.

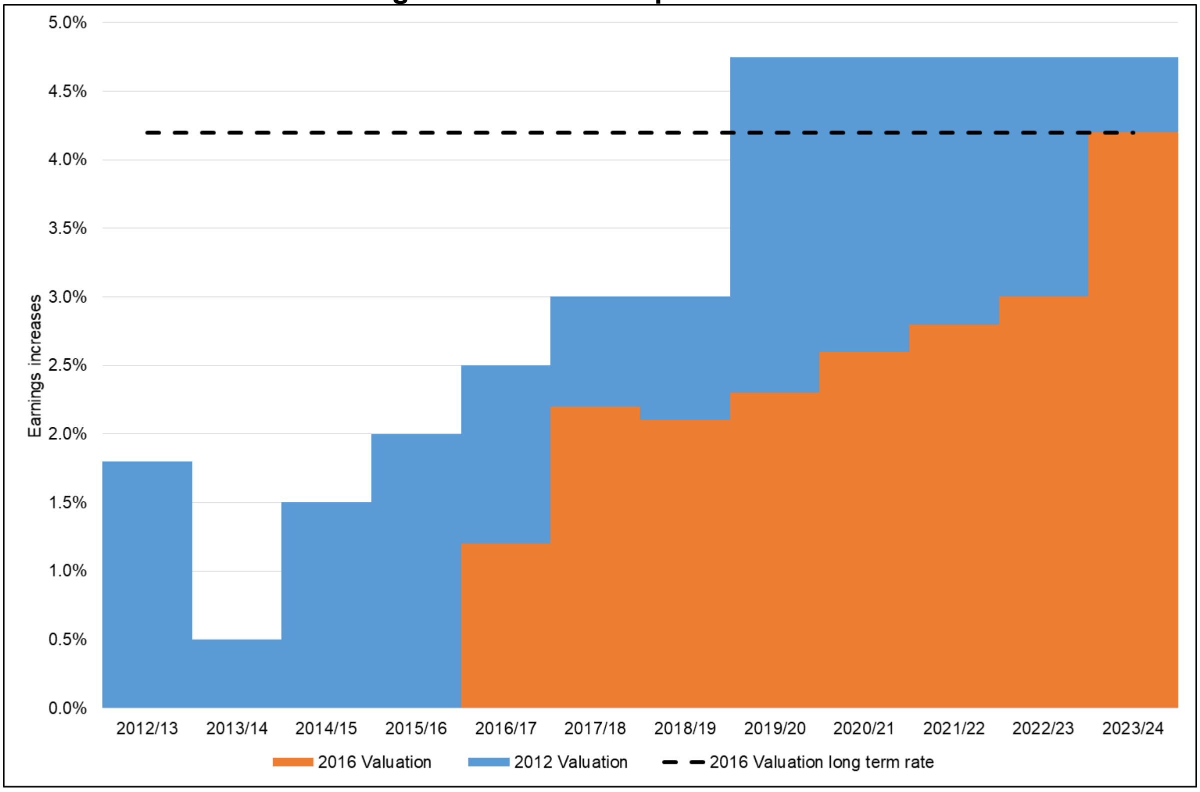
Chart 2.1: Difference between uncorrected employer contribution rate and employer contribution rate calculated at previous valuation (% of pensionable pay)



2.16 The change in financial assumptions item is primarily due to changes in the ***SCAPE discount rate***. This is the rate used to discount future payments from the Scheme. A lower rate leads to a higher assessment of the value of the payments. ***The SCAPE discount rate*** is based on the OBR's forecast for long-term GDP growth and so aims to reflect the cost of the pension scheme obligations being made relative to the future size of the economy. The OBR has reduced the long-term forecast twice since the 2012 valuation. Accordingly, the ***SCAPE discount rate*** has been updated to reflect these changes and was reduced from 3.0% pa above CPI to 2.8% pa above CPI from April 2016 to April 2019 and was subsequently reduced to 2.4% pa above CPI. This affects the value placed on the liabilities for both benefits that have been accrued in the past and benefits that will accrue in the future. The reductions in the ***SCAPE discount rate*** result in a larger deficit (and thus past service contribution requirement) and a higher cost of accruing benefits.

2.17 Other financial assumption changes include changes in the assumed levels of pension increases and earnings increases. Overall these changes offset the change in ***SCAPE discount rate*** to some extent but have a much smaller impact. The 2016 valuation Directions anticipate public sector pay restraint will continue for a longer period than was assumed for the 2012 valuation. They also assume a slightly lower rate of long-term earnings increase which are based on OBR forecasts. The 2016 valuation earnings assumptions are shown in orange in Chart 2.2.

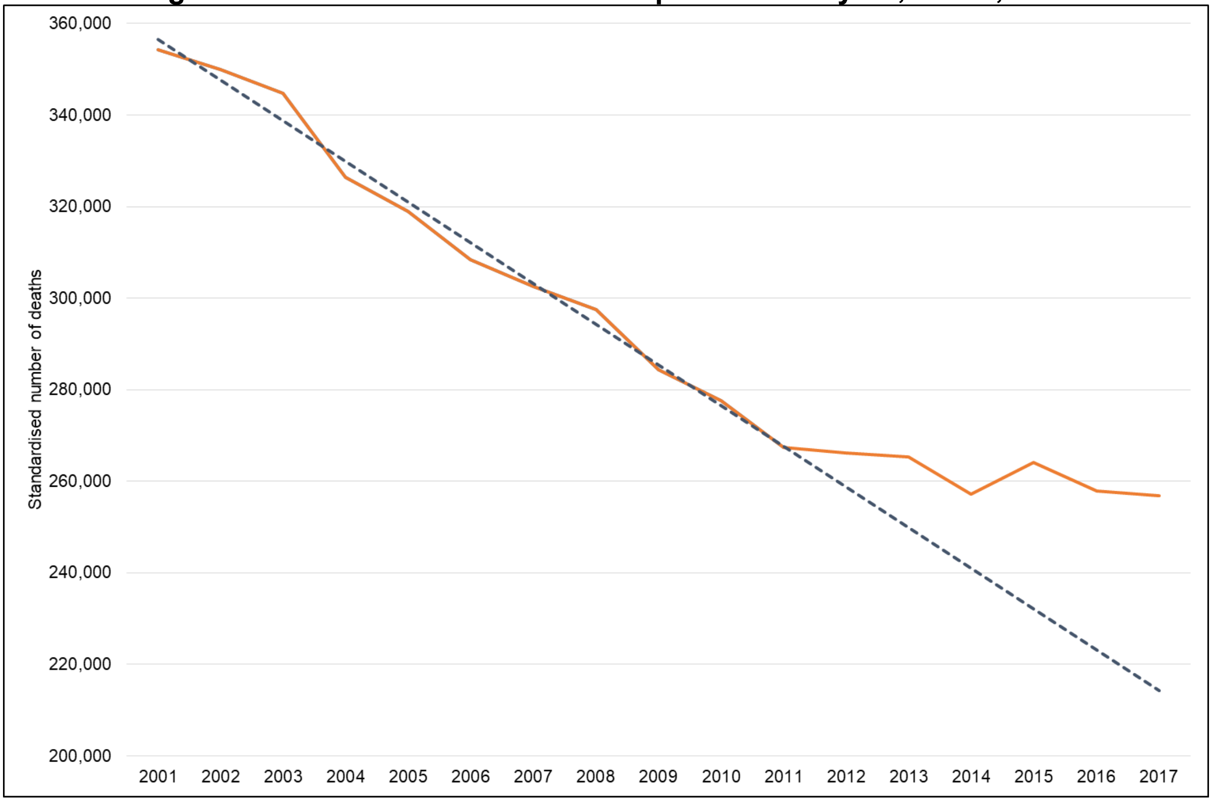
Chart 2.2: Short-term earnings increase assumptions



2.18 The change in demographic assumptions item reflects the impact of a number of items including changes in scheme specific assumptions. However, the main driver behind this reduction of costs is a reduction in assumed future improvements in life expectancy under the ONS-2016 projections when compared with the ONS-2012 projections which were used in the 2012 valuation. The use of these projections is set out in the Directions.

2.19 Chart 2.3 shows the recent UK population experience which has resulted in the revision of ONS projections of future life expectancy. The number of standardised[6] deaths over time is shown by the solid orange line. The dotted line is the trend that was observed up until 2012. This shows that in recent years the number of deaths has increased above the trend that was seen before 2012. This recent experience has resulted in a downwards revision of future improvements in life expectancy with Scheme members being assumed to receive benefits for a shorter period of time than assumed at the previous valuation.

Chart 2.3: Age standardised number of deaths per calendar year, Males, UK



Employer contribution correction cost

2.20 The Public Service Pensions Act 2013 provides for the establishment of an employer cost cap mechanism to ensure that the costs of the pension schemes remain sustainable in future.

2.21 In her WMS made on 30 January 2019 the Chief Secretary to the Treasury announced that there would be a pause to the cost cap process pending the outcome of ongoing litigation concerning the transitional protection arrangements in the schemes. Amendments have been made to the Directions for the purposes of effecting this pause whilst providing a means for calculating a revised employer contribution rate.

[6] This is the number of deaths each year adjusted to remove the impact due to the population having different ages

2.22 The ***corrected employer contribution rate*** is calculated in the same way as the ***uncorrected employer contribution rate*** except that the accrual rate of the 2015 Scheme is assumed to be improved from 1 April 2019 to the extent necessary such that the ***employer contribution correction cost*** equals the ***target cost of the scheme***. The WMS confirmed that, should the Court of Appeal's ruling in the McCloud/Sargeant case be overturned, changes to employee benefits would be implemented to achieve the target cost of the scheme.

2.23 The following section sets out the derivation of the ***employer contribution correction cost*** and indicates the amount by which alignment of the ***employer contribution correction cost*** with the ***target cost of the scheme*** (assuming that this is done via an improvement in the accrual rate in the 2015 Scheme from 1 April 2019) increases the cost of accrual over the implementation period.

Employer contribution correction cost

2.24 Direction 42 requires the ***employer contribution correction cost*** to be determined as ((A + B) – C) – D, where

- A is the ***cost cap future service cost***, calculated in accordance with direction 40;
- B is the ***cost cap past service cost*** calculated in accordance with direction 41;
- C is the ***cost cap contribution yield*** calculated in accordance with direction 31; and
- D is the ***cost cap difference*** calculated in accordance with direction 42A.

2.25 Table 2.1 sets out the calculation of the ***employer contribution correction cost*** together with the comparison with the ***proposed employer cost cap*** set at the 2012 valuation. Further detail of the calculation of the component elements is given in section 3.

Table 2.1: Employer contribution correction cost

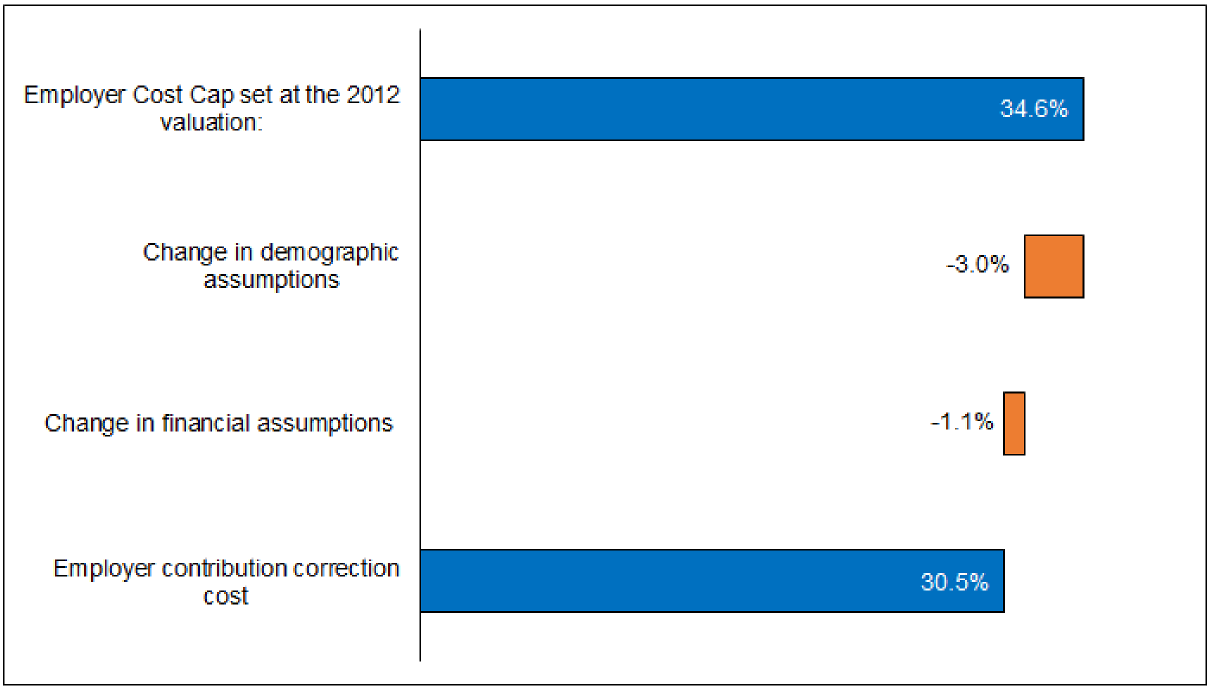
	% pa		Direction
Proposed employer cost cap set at 2012 valuation	**34.6**		
Cost cap future service cost (Contribution rate required to cover expected cost of benefits accruing between 1 April 2019 and 31 March 2023 by reference to assumptions in Direction 40)	38.2	A	*40*
Plus ***cost cap past service cost*** (Contribution rate required to be paid for 15 years from 1 April 2016 to correct cost cap shortfall at 31 March 2016)	(2.5)	B	*41*
Less ***cost cap contribution yield*** (Contribution yield expected from members between 1 April 2019 and 31 March 2023)	0.0	C	*31*
Less ***cost cap difference***[7]	5.2	D	
Employer contribution correction cost	**30.5**	***A+B-C-D***	***42***
Difference between target cost of the scheme and ***employer contribution correction cost***	**4.1**		

2.26 Direction 43A requires the ***corrected employer contribution rate*** to be calculated assuming that the accrual rate set in scheme regulations for the 2015 Scheme has been adjusted from 1 April 2019 to the extent necessary for the ***employer contribution correction cost*** to be set equal to the target cost of the scheme. If the accrual rate of the 2015 Scheme is increased to 1/42.2 from 1 April 2019 this will result in the ***employer contribution correction cost*** being equal to the target cost. The addition to the employer contribution rate for providing this level of accrual in the 2015 Scheme from 1 April 2019 is 4.1% of pensionable pay. The resulting ***corrected employer contribution rate*** is 63.5% of pensionable pay.

[7] This is the difference between the employer cost cap (after SCAPE adjustment) which is 39.8%, and the original ***proposed employer cost cap*** (set at the 2012 valuation) of 34.6%.

2.27 Chart 2.4 summarises a comparison between the ***employer contribution correction cost*** and the ***proposed employer cost cap*** which was calculated in the 2012 valuation.

Chart 2.4: Employer contribution correction cost compared with the proposed employer cost cap (% of pensionable pay)



2.28 The change in demographic assumptions item is primarily as described in paragraphs 2.18 and 2.19.

2.29 The change in financial assumptions item in Chart 2.4 is primarily due to the change in directed earnings assumptions, which are based on OBR forecasts[8]. As discussed in paragraph 2.17, the 2016 valuation Directions anticipate public sector pay restraint will continue for a longer period than was assumed for the 2012 valuation, which leads to a downward cost pressure.

2.30 The change in ***SCAPE discount rate*** and long term earnings assumptions described in paragraphs 2.16 and 2.17 do not have a significant impact on the ***employer contribution correction cost*** because the Directions operate to largely remove the impact of these changes.

2.31 Further details regarding the calculations are provided in section 3.

[8] The specific OBR forecast referenced by HM Treasury for the Directions is the Economic and Fiscal Outlook (EFO) published in March 2018 as explained in the technical annex to the draft 2018 Direction amendment.

3 Analysis of results

This chapter provides further details on the **valuation results** *and how these have changed since the previous valuation*

Analysis of uncorrected employer contribution rate

A(i) Whole scheme valuation balance sheet – past service position

3.1 The assets and past service liabilities of the aggregate scheme as at the ***effective date*** calculated in accordance with the Directions, and otherwise as specified in this report, are set out in Table 3.1. Corresponding figures at the previous valuation date are shown for comparison purposes.

Table 3.1: Whole scheme valuation balance sheet

	31 March 2016 £ billion	*Direction*	31 March 2012 £ billion
Aggregate scheme notional assets	**68.5**	***25***	**57.0**
Aggregate scheme liabilities in respect of:			
Active members	26.2		24.6
Deferred pensioners	17.8		14.6
Pensioners	41.7		28.5
Total aggregate scheme liabilities	**85.7**	***24***	**67.6**
Surplus (Shortfall)	**(17.1)**		**(10.6)**

3.2 The liabilities valued include the value of all benefits currently or prospectively payable under the aggregate scheme to pensioners[9] and deferred pensioners as at 31 March 2016 and to active members as at 31 March 2016 in respect of service completed to the ***effective date***. In the case of active members, liabilities include those arising from future pay inflation or in-service benefit revaluation to the assumed future date of cessation of pensionable service. The derivation of the notional scheme assets at this valuation is set out in Appendix D.

[9] For the purpose of determining the ***employer contribution rate***, liabilities and notional assets for members whose pensions commenced before 1 April 2001, and their dependants, are excluded as required by Direction 27(2). All the assets and liabilities shown in this report are determined after this exclusion.

3.3 The previous valuation of the Armed Forces Pension Scheme was carried out as at 31 March 2012. Table 3.2 shows how the valuation balance sheet has changed since the previous valuation. Some figures have been calculated in an approximate manner but are sufficient to show the general size of the impact on the balance sheet. Table 3.3 provides further information on the items identified. Impacts are considered in the order listed. Using a different order could change the intermediate figures, though there is no impact on the final shortfall.

Table 3.2: Whole scheme valuation balance sheet - Comparison with previous valuation

	£ billion	**Note**
Surplus (shortfall) at 31 March 2012	(10.6)	
Interest on surplus (shortfall)	(2.1)	
Excess of contributions paid against cost of benefits accruing 2012 to 2016	(0.5)	1.
Past Service Cost effect from GMP indexation for certain members	(0.1)	2.
Repayment of deficit	1.0	3.
Impact of known PI on discount rate for 2014/15 and 2015/16 (relative to short term earnings assumptions)	(1.0)	4.
Experience effects		
Pay increases	0.8	5.
Ill health retirements	(0.0)	
Age retirements	(0.0)	
Withdrawal experience	0.1	
Deaths in service	(0.0)	
Commutation higher than expected	0.0	
Pensioner mortality heavier than expected	0.0	
Negative inflation in 2016	(0.1)	
Change in financial assumptions	(7.3)	6.
Impact of change in demographic assumptions (including change in ONS projection table)	2.8	7.
Unattributed	(0.3)	8.
Surplus (shortfall) at 31 March 2016	(17.1)	

Table 3.3 provides further information on the items identified.

Table 3.3: Explanation of analysis

Note	Explanation
1.	This impact has been assessed on the financial assumptions applying to the 2012 valuation.
2.	The Scheme will now pay CPI increases on guaranteed minimum pension (GMP) for members reaching State Pension Age before 6 April 2021.
3.	Repayment of deficit as anticipated at 2012 valuation. This figure represents the 16.9% of pay expected to be paid towards the deficit between 2012 and 2016.
4.	The pension increases awarded in April 2015 and April 2016 were not known at the 2012 valuation but are now known. The difference between the actual and expected pension increases has an impact on the valuation calculations.
5.	Pay increases over the period between the previous and current valuations for those members remaining in service over the period, and who represent a substantial proportion of the liability, were lower than anticipated. This is due to the pay restraint policy applied to public service workers during the period.
6.	The financial assumptions are set by HM Treasury. Appendix F summarises the financial assumptions set for the current and previous valuations. The most financially significant change in the long-term financial assumptions is the reduction in the discount rate from 3% pa above CPI to 2.4% pa above CPI. This item also includes the offsetting impact of a reduction in the expected long term rate of general pay increases from 4.75% pa to 4.2% pa. The Directions specify some variation in financial assumptions for the period between the ***effective date*** and the end of the ***implementation period***. The short-term assumptions specified for the 2016 valuation are different to those specified for the 2012 valuation and result in a lower value of assessed liabilities.
7.	The impact of the change in demographic assumptions is the net result of a number of changes. These include change in the baseline mortality assumption, a decrease in the rate of future mortality improvements, changes in the proportion of ill-health retirements qualifying for the three different tiers of benefits, changes to assumed promotional pay growth and proportions qualifying for a dependant's benefit and an increase in the allowance for commutation of pension for cash. The changes in demographic assumptions result in a lower value of assessed liabilities. Further details on the changes to the demographic assumptions can be found in the Assumptions report.
8.	Unattributed amount is the balancing item.

A(ii) Corrected employer contribution rate – past service impacts and accrual cost

3.4 Table 3.4 shows a comparison between the corrected employer contribution rate and the employer contribution rate calculated at the previous valuation. Some figures have been calculated in an approximate manner but are sufficient to show the general size of the impact on the contribution rate. Impacts are considered in the order listed. Using a different order could change the intermediate figures, though there is no impact on the final contribution rate.

Table 3.4: Corrected employer contribution rate - Comparison with previous valuation

	% pay
Employer contribution rate determined at 31 March 2012	**50.4**
Change in financial assumptions	6.3
Impact of change in demographic assumptions (including change in ONS projection table)	(1.7)
Change owing to past service adjustment (difference in deficit)	4.0
Run-off of the Pre-Reform Scheme	0.1
Change in average age (accrual cost)	0.0
Change in longevity assumption due to passage of time (accrual cost)	0.4
Change in average SPA (accrual cost)	0.0
Unattributed	(0.1)
Uncorrected employer contribution rate determined at 31 March 2016	**59.4**
Change in scheme accrual rate to align the ***employer contribution correction cost*** to the ***target cost of the scheme***	**4.1**
Corrected employer contribution rate determined at 31 March 2016	**63.5**

Employer Contribution Correction Cost

B(i) Cost cap fund balance sheet – past service position

3.5 The ***initial cost cap fund*** is determined in accordance with direction 30 and represents a notional pot of assets equal to the liabilities of contributing members at 31 March 2015 and includes all benefits prospectively payable from the Scheme to those members in respect of service completed to that date. Liabilities arising from future pay inflation, or in-service benefit revaluation, to the assumed future date of cessation of pensionable service are included. The ***initial cost cap fund*** has been calculated as part of this valuation as £28.7 billion.

3.6 The ***employer contribution correction cost*** is a measure of the cost to employers of providing benefits under the 2015 scheme to all currently contributing members, with an allowance for past service effects for members who were contributing to the Scheme as at 31 March 2015. The ***employer contribution correction cost*** for the ***implementation period*** (1 April 2019 to 31 March 2023) is 30.5% of pensionable pay. This compares to the ***proposed employer cost cap*** of 34.6% set following the 2012 valuation.

3.7 The ***cost cap fund*** and ***cost cap liabilities*** at the ***effective date*** calculated in accordance with the Directions, and otherwise as specified in this report, are set out in Table 3.5. The ***initial cost cap fund*** was set as part of this valuation (as the position as at 31 March 2015), so there are no comparative figures at the previous valuation date. The derivation of the ***cost cap fund*** at this valuation is set out in Appendix D.

Table 3.5: Cost cap fund valuation balance sheet

	31 March 2016 £ billion	***Direction***
Cost cap liabilities	**26.4**	***39***
Relating to benefits accrued in the pre-2015 schemes and for members in service at the ***valuation date***	21.0	
Relating to benefits accrued in the post-2015 scheme	5.4	
Cost cap fund	**28.3**	***37***
Cost cap surplus (shortfall)	**1.9**	

3.8 The value of the ***cost cap liabilities*** includes the value of all liabilities for active members of the aggregate scheme at 31 March 2016 and the value of all benefits currently or prospectively payable to pensioners and deferred pensioners from the 2015 Scheme only as at 31 March 2016. For current active members the value of the liabilities comprises the value of all benefits prospectively payable from the aggregate scheme to those members in respect of service completed to that date, including the value of liabilities arising from future pay inflation, or in-service benefit revaluation, to the assumed future date of cessation of pensionable service.

B(ii) Employer contribution correction cost – past service impacts and accrual cost

3.9 Whilst the ***effective date*** of the actuarial valuation is 31 March 2016, the cost cap contribution rates determined are those which would be applicable in respect of the period 1 April 2019 to 31 March 2023 (the ***implementation period***).

3.10 The ***proposed employer cost cap*** (set at the 2012 valuation) and the ***employer contribution correction cost*** over the ***implementation period*** are set out in Table 3.6.

Table 3.6: Employer contribution correction cost summary

	2016 % pa		***Direction***
Proposed employer cost cap	**34.6**	**A**	***Set in 2012***
Employer contribution correction cost	**30.5**	**B**	***42***
Difference	**4.1**	**A-B**	***43(a)***

3.11 The ***employer contribution correction cost*** over the ***implementation period*** is determined from several components, which are summarised in Table 2.1. The table also shows a comparison with the ***proposed employer cost cap***.

3.12 Table 3.7 shows how the ***employer contribution correction cost*** has changed from the ***proposed employer cost cap*** as determined in the previous valuation. The past service impacts and accrual cost impacts are shown separately and have been considered in the order listed. Using a different order could change the allocation between items shown.

Table 3.7: Employer contribution correction cost analysis

	Past service	Accrual cost
Change in financials[1]	(1.1)%	n/a
Change in mortality assumptions[2]	(1.0)%	(0.6)%
Changes in demographic assumptions[3]	(0.2)%	(1.6)%
Change in average age[4]	n/a	0.0%
Change in average SPA[5]	n/a	0.0%
Identified experience gain[6]	(0.2)%	n/a
Mortality improvements: improvement due to elapsed time[7]	n/a	0.4%
Unexplained[8]	0.0%	0.2%
Total difference between ***employer contribution correction cost*** and ***target cost of the scheme*** (past service/accrual cost)	(2.5)%	(1.6)%
Total difference between employer contribution correction cost and target cost of the scheme	**(4.1)%**	
Employer contribution correction cost	**30.5%**	

3.13 Table 3.8 provides further information on the items identified.

Table 3.8: Employer contribution correction cost - Explanation of analysis

Note	Explanation
1.	The ***cost cap difference*** removes the impact of long-term financial effects from the cost cap mechanism. This item reflects the impact of change in short term assumptions between the 2012 and 2016 valuation directions.
2.	This is mainly due to the change in directed mortality improvements resulting from the change from ONS 2012 to 2016. This results in a reduction in expected future life expectancy.
3.	This is the impact of changes to demographic assumptions other than mortality, primarily the ill-health retirement assumption, the promotional pay assumption, the proportion married assumption and the directed commutation assumption. Other demographic assumption changes largely cancel out.
4.	Any change in the average age of the membership at successive valuation dates will affect the assessed cost of future benefit accrual. As the Directions require the estimation of the cost of benefit accrual for future periods, any assumption about ageing of the active membership in the future may also contribute to the change in expected cost. Little ageing was anticipated at the 2012 valuation, and no ageing is allowed for in the 2016 valuation. Under this approach, the change in average age was not sufficient to lead to a change in the ***employer contribution correction cost.***
5.	Although there has been no change in the timetable of State Pension Age (SPA)

used for the valuation, the passage of time means that current members (with close to the same average age as the 2012 membership), have on average, later SPA than the previous membership set. The later dates for entitlement to deferred pension result in cost savings in the 2015 Scheme, although these were not sufficient to lead to a change in the ***employer contribution correction cost***.

6. The experience gain shown relates mainly to pay. The impact of pay restraint on overall pensionable pay growth has resulted in lower increases over 2015/16 than assumed at the 2012 valuation, the latter being the combined assumption of general pay growth as directed and promotional pay growth as set on a scheme specific basis.

7. The passage of time and the nature of the directed assumption for mortality improvements means that a member now aged 45 will have a different future life expectancy to a member aged 45 at the 2012 valuation. The figures shown reflect the impact of the passage of time on future life expectancy between successive ***implementation periods***. The impact shown is after allowance for the change in improvement basis described in note 2.

8. The unexplained item is expected to be a result of the aggregate impact of small and unidentified experience effects. A figure of 0.2% of pay is not unexpected given the nature of the calculations and attribution.

4 Sensitivity of valuation results to assumptions

*This chapter illustrates how the **valuation results** would change if different assumptions were used.*

4.1 This section illustrates the sensitivities of the ***valuation results*** to the assumptions adopted[10].

4.2 Table 4.1 shows the sensitivities relative to the ***uncorrected employer contribution rate*** and the ***employer contribution correction cost.*** The Secretary of State determined assumptions are set as best estimate based on available evidence (note the commentary in paragraph 1.7). The sensitivities illustrate how the valuation outcomes would change had different evidence been observed, leading to the Secretary of State setting the different assumptions illustrated below. They are not intended to show the possible range of variation in assumptions which might be considered at future valuations and in light of future experience.

4.3 Section 5 comments on the main uncertainties which could result in some variations in the ***valuation results*** at subsequent valuations.

Table 4.1: Sensitivity of valuation results to assumptions

	Addition to uncorrected employer contribution rate	Addition to employer contribution correction cost[11]	Note
A. Directed assumptions			
Discount rate in excess of CPI (-0.25% pa)	9.4%	(0.5)%	1.
Pension increases as applicable to pensions in payment and deferred pensions (+0.25% pa)	8.1%	(0.2)%	2.
Long term rate of public service earnings growth in excess of CPI (+0.25% pa)	0.1%	(0.2)%	3.
Short term rate of public service earnings growth (+0.25% pa to each short term rate)	0.1%	0.3%	4.
CARE revaluation rate (+0.25% pa to price measure revaluation rates)	n/a	n/a	5.
CARE revaluation rate (+0.25% pa to earnings measure revaluation rates)	1.0%	(0.1)%	

[10] Including those set out in Directions and those set by the Secretary of State (as specified in direction 19(e)).
[11] The sensitivity of the ***employer contribution correction cost*** shown in the table allows for any offsetting expected from resulting changes to the cost cap difference, for items defined as "employer costs" in HM Treasury's 2014 paper Public Service Pensions: actuarial valuations and the employer cost cap mechanism.

Allowance for future mortality improvements (reduction in mortality improvements such that (period) life expectancy lower by around 1.25 years over 75 years)	(2.9)%	(1.1)%	
State pension age (SPA for 2015 scheme one year later than under current directions)	(1.1)%	(0.9)%	6.
Allowance for commutation as directed (additional 2% of pension assumed to be commuted for cash)	(0.2)%	(0.2)%	7.
Shortfall spreading period (spreading period increased by 5 years)	(5.1)%	0.6%	8.
B. Secretary of State set assumptions			
Membership profile: 2 years older on average over implementation period	0.5%	0.5%	9.
Mortality rates: 5%* heavier rates of pensioner mortality	(1.1)%	(0.5)%	
Age retirement rates: 5% increase in number of new joiners assumed to reach immediate pension/early departure payment point	1.2%	1.1%	
Ill-health retirement: 5%* increase to assumed rates	0.1%	0.1%	
Ill-health retirement: 5%* increase in proportion assumed to receive higher tier benefits	0.1%	0.1%	
Proportions partnered: 5%* more members assumed to have qualifying partners at death	0.6%	0.2%	
Resignations and opt outs: 5%* higher numbers assumed to leave voluntarily before retirement (net of rejoiners)	(0.5)%	(0.5)%	10.
Promotional pay increases: 0.5% higher promotional pay increases than assumed	0.4%	1.0%	11.

* All these represent multiplicative increases to rates, i.e. 5% means rates 1.05 times higher.

Note: Opposite changes in the assumptions will produce approximately equal and opposite changes in the valuation results.

4.4 Table 4.2 provides further information on the sensitivity items.

Table 4.2: Sensitivity of valuation results to assumptions - Explanation of analysis

Note	Explanation
1.	This shows the impact of a 0.25% pa decrease in the ***SCAPE discount rate*** with all other financial assumptions remaining unchanged.
2.	This shows the impact of a 0.25% increase in the long term assumption for the Pension Increase (Review) order to 2.25% with the gross ***SCAPE discount rate*** and earnings assumptions remaining unchanged.
3.	This shows the impact of a 0.25% pa increase in the assumed long term rate of public service earnings increases of 4.2% pa with all other assumptions remaining unchanged.
4.	This shows the impact of a 0.25% pa increase in each of the assumed short term rates of public service earnings with all other assumptions remaining unchanged. Combined with the long term rate of public service earnings increases sensitivity, this shows the impact of a change in all earnings assumptions.
5.	This shows the impact of a 0.25% increase to the assumption for Average Weekly Earnings growth which determines the rate of in-service revaluation with the gross ***SCAPE discount rate*** and earnings assumptions remaining unchanged.
6.	This shows the impact of an increase in State Pension Age of 1 year for all members.
7.	This shows the impact of increasing the proportion of pension commuted for cash from 17.5% to 19.5% for benefits with no attaching automatic lump sum.
8.	This shows the impact of spreading any surplus / deficit over a period of 20 years (ie five years longer than the current spreading period).
9.	This shows the impact of a two year increase in average ages for the duration for the implementation period.
10.	This shows the impact of an increase in the withdrawal assumption by 5%.
11.	This shows the impact of an increase in the promotional pay increase assumption by 0.5% pa.

4.5 In each item in Table 4.1 the sensitivity shown is in relation only to the change in the assumption described. The impact of a combination of assumption changes will not necessarily equate to the sum of the relevant rows above.

4.6 The sensitivities shown refer only to the results of this valuation. The sensitivity of the results to certain assumptions is expected to change materially over time. This is particularly the case for the ***employer contribution correction cost*** as the ***cost cap liabilities*** reflects only final salary liabilities for active members, but over time will reflect only liabilities accrued in the career average scheme and for all categories of member.

4.7 The main impact of certain financial assumptions, specifically the ***SCAPE discount rate*** and rate of long term earnings growth, is explicitly removed from the ***employer contribution correction cost*** calculations as provided in Directions. There is some residual sensitivity as shown in rows 1 to 3 of Table 4.1 – this relates to the past service liabilities included within the ***employer contribution correction cost*** calculations.

5 Uncertainties around possible outcomes of the next valuation

This chapter considers some of the uncertainties relating to the outcomes of the next valuation.

5.1 The results of this valuation are set out in Sections > and 3. Section 4 outlines the sensitivity of the results to the assumptions adopted. The sensitivities shown in that section are intended to illustrate a range of reasonable outcomes which might have been determined at this valuation had different assumptions been used. The range of reasonable outcomes at this valuation is different to, and not necessarily related to, the possible range of outcomes at future valuations.

5.2 The Chief Secretary to the Treasury announced on 6 September 2018 that there would be a review of the cost cap mechanism. Further, the Chief Secretary to the Treasury's WMS of 30 January 2019 announced a pause to the cost cap mechanism. This report does not address the cost cap although it provides for a quantification of the ***corrected employer contribution rate*** which recognises the higher cost of accrual in the 2015 scheme from April 2019 resulting from alignment of the ***employer contribution correction cost*** with the ***target cost of the scheme***. Any alternative changes resulting from the ongoing litigation could have a large impact on the 2020 ***valuation results***.

5.3 The results of the next valuation (assuming that we are directed to calculate both the ***uncorrected employer contribution rate*** and the ***employer contribution correction cost***) will differ from the results shown in this report for many reasons. Table 5.1 shows some of these reasons. These differences can be split into three categories:

- those that are expected;
- those that are likely to occur due to short-term variations between experience and assumptions or otherwise; and
- those that are possible but less likely, for example, resulting from more significant experience variations leading to changes in assumptions or from material data errors.

5.4 More explanation relating to the items in the table is given in the remainder of this section.

5.5 All cost pressures are assumed to feed through to the ***uncorrected employer contribution rate*** and the ***employer contribution correction cost*** in line with the Directions; more detail on how the Directions treat cost pressures is set out in paragraphs 2.31 to 2.35 of *Public service pensions: actuarial valuations and the employer cost cap mechanism* published by HM Treasury in March 2014.

5.6 We have ignored items such as changes to the Directions (apart from those described as "likely" in paragraph 2.39 of *Public service pensions: actuarial valuations and the employer cost cap mechanism*) because it is impossible for us to form any judgement on the likelihood or quantum of such changes.

Table 5.1: Items that may affect the next valuation

Item		Uncorrected employer contribution rate[12]	Employer contribution correction cost
Expected:	Reduction in proportion of membership accruing benefits in pre 2015 Schemes	o	N/A
	Partial deficit/surplus repayment	✓	✓
	Short-term mortality improvements & increases in members' average SPA	o	o
	Run-off of short-term financials up to the next valuation date	✓	o
Likely:	SCAPE discount rate change	✓✓	o
	Data issues in the CCNLL calculation	N/A	✓
	Legislative and policy changes	✓✓	✓✓
	Short-term experience effects:		
	- demographic	✓	✓
	- financial	✓	✓
	Assumption changes:		
	- short-term financials after the next valuation date	✓✓	✓✓
	- mortality improvements	✓✓	✓✓
Possible:	Errors found in data sets from previous valuations	✓✓	✓
	Unanticipated membership changes	✓	✓
	Assumption changes:		
	- long term experience effects	✓✓	✓
	- directed assumptions (other than those previously mentioned)	✓	✓

2 Key[13]: N/A = not applicable, o = impact is likely to be less than 0.5% of pay,

3 ✓ = impact may well be more than 0.5% of pay but, although possible, is quite unlikely to be more than 2% of pay.

4 ✓✓ = impact may well be more than 2% of pay

[12] Each item is considered separately; a combination of these items could have a larger impact than is considered likely for any of those items individually.
[13] Showing relative importance of items in the table, in our judgement at the time of signing.

5.7 As explained above, some of the factors affecting the results of the next valuation are relatively predictable. For example:

Table 5.2: Relatively predictable factors possibly affecting next valuation

Note	Explanation
1.	**Scheme membership:** There will be fewer members of the pre 2015 Schemes as protected members retire. This will impact on the cost of future accrual, in most cases reducing it somewhat.
2.	**Surplus or Deficit:** Part of the existing surplus or deficit will be paid off through the contributions payable before the next ***implementation date***. This will increase (surplus) or reduce (deficit) the ***uncorrected employer contribution rate*** and the ***employer contribution correction cost***.
3.	**Mortality improvements:** Life expectancies are expected to increase, though the impact of this should be offset to an extent by increases in the average SPA of active members.
4.	**Run-off of short-term financials:** The short-term financial assumptions up to the ***effective date*** of the next valuation will determine some of the experience effects at the next valuation but otherwise will not be relevant to the determination of the ***valuation results*** of the next valuation.

5.8 It would be possible to calculate the expected contribution rate at the next valuation allowing for these more predictable effects. However, any estimate would still be subject to considerable uncertainty, not least because of the long period over which the membership would need to be projected.

5.9 Other impacts on the results of the next valuation are less predictable. These include:

Table 5.3: Less predictable factors possibly affecting next valuation

Note	Explanation
5.	**SCAPE discount rate change:** Changes in the SCAPE discount rate have a significant impact on the ***uncorrected employer contribution rate.*** The Directions intentionally remove the main impact of a change in the SCAPE discount rate from the ***employer contribution correction cost*** results. A small impact remains if there is a change in the cost cap surplus/deficit over the ***inter-valuation period***.
6.	**Data issues in the CCNLL calculation:** The data available for the valuation was of insufficient quality to accurately calculate the CCNLL. This introduces a degree of uncertainty into the ***employer contribution correction cost*** results[14]. For this valuation the degree of uncertainty is very small since the cost cap mechanism has been in operation for only a single year. Should action not be taken to make appropriate data available at subsequent valuations there *will* be a material degree of uncertainty in the ***valuation results***, specifically in the calculation of the **employer contribution correction cost**.
7.	**Legislative and policy changes:** In addition to the uncertainty around the transitional protection arrangements, explained in the executive summary, Appendix E lists various legal challenges and other legislative/policy changes that could impact on the next valuation. The impact of each individual item may not exceed 2%, however, some of them could do individually or in combination with others.
8.	**Short-term experience effects:** If experience is not in line with the assumptions made, a gain or loss will emerge over an ***inter-valuation period***. Although the scale of the experience effects seen over the current ***inter-valuation period*** is not necessarily indicative of the scale of the effects for future periods it is reasonable to infer that the impact of demographic experience effects is likely to be considerably lower than the potential impact of financial experience effects. For example, at this valuation none of the items of demographic experience resulted in an impact on the ***corrected employer contribution rate*** of more than around 0.1% of pay whereas the pay experience was equivalent to a contribution impact of around 1% of pay.
9.	**Data:** If the data used for this valuation is later shown to be materially incorrect or inconsistent with future datasets, a gain or loss will emerge when it is corrected or the inconsistency is identified.
10.	**Unanticipated membership changes:** The distribution of future Scheme membership may differ from that projected at this valuation.
11.	***Long term experience effects***: Assumption changes at future valuations, in light of scheme experience, may have more substantial effects on the results than actual short-term experience effects. The greater sensitivity to assumption changes is because typically the assumptions apply to longer periods than the experience effects are measured over.

[14] Please see Appendix A of the Assumptions report

12. ***Directed assumptions*: **Assumptions may change for reasons other than scheme experience, and paragraph 2.39 of *Public service pensions: actuarial valuations and the employer cost cap mechanism* flags that some of the assumptions set in the Directions are likely to change for each valuation. Both the ***corrected employer contribution rate*** and the ***employer contribution correction cost*** results are particularly sensitive to changes in the short-term financial assumptions, the mortality improvement assumptions and the assumed rate of commutation.

Martin Clarke
Government Actuary
28 February 2019

Alan Dorn
Fellow of the Institute and Faculty of Actuaries
28 February 2019

Appendix A: Additional Results

Background

A.1 The key results of this valuation can be found in sections 2 and 3 of this report.

A.2 The Directions require information to be disclosed regarding the ***uncorrected employer contribution rate,*** calculated assuming that the Scheme's benefit design is unchanged from that as at 31 March 2016 over the ***implementation period.***

A.3 The relevant ***valuation results***, expressed as a percentage of pensionable payroll, are summarised in Table A1.

Table A1: Contribution rates

	2016	2012[15]		
	% pa	**% pa**		***Direction***
Contribution rate required to be paid for 15 years from 1 April 2019 to correct shortfall at 31 March 2016 (A)	24.2	16.4	A	*27(1)(a)*
Contribution rate required to cover cost of benefits accruing between 1 April 2016 and 31 March 2019	35.9	34.1		*27(1)(b)*
Less normal member contribution rate expected between 1 April 2016 and 31 March 2019	0.0	0.0		*28(a)*
Less employer contribution rate expected between 1 April 2016 and 31 March 2019	50.4	32.1		*28(b)*
Net contribution shortfall between 1 April 2016 and 31 March 2019	(14.5)	2.0		
Contribution rate required to be paid for 15 years from 1 April 2019 to correct underpayment of contributions between 1 April 2016 and 31 March 2019 (B)	(3.3)	0.5	B	*27(1)(c)*
Contribution rate required to cover cost of benefits accruing over implementation period	38.5	33.5	C	*27(1)(d)*
Less normal member contribution rate expected over implementation period	0.0	0.0	D	*28(c)*
Uncorrected employer contribution rate required over implementation period (A + B + C)	**59.4**	**50.4**		***29***
Corrected employer contribution rate required over implementation period after adjustment to accrual rate such that employer contribution correction cost equals the employer cost cap	**63.5**	**n/a**		***43A***

[15] Corresponding payment periods all 4 years earlier

Appendix B: Key inputs

This chapter summarises the calculations that were carried out, including the data, methodology and assumptions used, and the analysis performed on the results.

Data

B.1 At the ***effective date***, there were 195,700 contributors to the Scheme with a total payroll of £5.5bn and 400,200 pensions in payment with total annual pensions amounting to £3.8bn. There were a further 416,900 ex-contributors who had not yet started to receive their pension. Appendix C provides a summary of the membership data. Further details on the data, including the checks carried out on that data, the limitations of those checks and adjustments made, are provided in the Data report.

Benefits

B.2 The benefits provided to members of the pre 2015 Schemes and the 2015 Scheme are set out in regulations[16]. The 2015 Scheme was introduced from 1 April 2015 and many pre 2015 Schemes members transferred to the 2015 Scheme on 1 April 2015. Under transitional arrangements aimed at providing protection for those nearest retirement age, some older members are continuing in the pre 2015 Schemes until they leave due to retirement or otherwise.

B.3 Full details on benefits and the membership of the Schemes is provided in the Data report.

Assumptions

B.4 The Directions specify certain assumptions to be used for the valuation whilst requiring certain other assumptions to be set as the Secretary of State's best estimates, after taking the advice of the ***scheme actuary***. Actuarial advice on the scheme specific assumptions (including variations appropriate for the purposes of determining the ***employer contribution correction cost***), and other relevant information (including an analysis of the Scheme's demographic experience), is set out in the Assumptions report.

B.5 We have been instructed by the Secretary of State, following consultation with relevant stakeholders, to adopt the best estimate assumptions recommended in our advice, having obtained HM Treasury consent to those assumptions. Appendix F summarises the key assumptions made.

[16] SI 2014/2336 (2015 scheme) and regulations relating to predecessor schemes (listed in Schedule 1 of the valuation Directions)

Methodology and calculations

B.6 The Directions specify that the Projected Unit Methodology should be used. Application of this methodology to determine the ***valuation results*** as specified requires some assumptions to be made about the size and make-up of the workforce up to the end of the ***implementation period***[17].

B.7 Since the expected cost of benefits provided to members in the pre 2015 Schemes differs from the expected cost of providing those members with benefits in the 2015 Scheme, projecting the membership gives a materially different estimate of the valuation result.

B.8 For short-term workforce planning purposes the Ministry of Defence assumes that, overall, a largely stable population will be maintained. We have accordingly assumed that over the period from the ***effective date*** to the end of the ***implementation period*** the overall profile of the membership in terms of distribution of headcount and pay by age and gender will remain stable. Because we allow the existing membership to 'run off' in accordance with the assumptions set out in Appendix F over the projection period we are therefore making an implicit assumption about the profile of new joiners to the Scheme over that period. Full details of the membership projection is provided in the Assumptions report.

B.9 The Directions specify that benefits should be attributed to periods of service in accordance with the requirements of International Accounting Standard 19: Employee Benefits.

Scheme benefits

B.10 First, an estimate is made of the amount of benefit to be received by each Scheme member (and their dependants, where applicable) over each future year of the Scheme, from the ***effective date*** onwards. In order to do that, it is necessary to make some assumptions about the future service and salaries of the Scheme members, and the length of time over which they will receive benefits.

B.11 Having estimated the benefits as a stream of projected cashflows from the ***effective date*** onwards, the second step is to calculate the capital sum which would need to be held at the ***effective date*** in order to pay all of the benefits. This requires an assumption to be made as to the rate of return which would be earned by the capital sum if it were invested. In the case of the Scheme, there is no actual sum of money, but the valuation approach is predicated on the premise that there is a notional fund with a notional investment return.

B.12 This capital sum is often referred to as the 'present value' of the benefits and is calculated by 'discounting' the future cashflows back to the ***effective date*** using the valuation discount rate (see Appendix F). The present value can alternatively be considered as the amount of money which would need to be invested at an assumed interest rate (equal to the discount rate) in order to pay all the benefits. The result of

[17] 1 April 2019 to 31 March 2023

the calculation is, by its nature, a planning or budgeting estimate, not a 'valuation' as such.

Notional assets

B.13 The Schemes are financed by contributions from employers and current members of the Schemes. The contributions paid to the Schemes fall into general government revenues. There is no actual fund of assets but an account is maintained of a notional fund made up of contributions paid by employers and members, supplemented by a return on the notional fund at a pre-determined rate and reduced by benefits as and when they are paid to retired and former members of the Scheme. The notional fund of the Schemes in aggregate stood at £68.5bn as at the ***effective date***. Appendix D provides further information on the development of the notional fund since the previous valuation as at 31 March 2012. Appendix E sets out the rates of contribution paid since the previous valuation and summarises other events affecting the Scheme since that valuation.

B.14 The calculation of the ***employer contribution correction cost*** uses a similar concept of ***notional assets***. In this case, a notional fund (the ***initial cost cap fund***) is established as part of the current valuation and is set equal to the value of the liabilities of active members as at 31 March 2015 using the assumptions adopted for the 2012 valuation. An account of the notional ***cost cap fund*** will be maintained for future dates. The initial ***cost cap fund*** is increased by contributions (as determined for cost cap purposes) and a notional return, and reduced by benefit payments (relating to the 2015 Scheme only) and liability amounts (relating to the pre 2015 Schemes only) as members leave active service.

Calculations

B.15 For the valuation, it is necessary to separate the capital sum into two parts: (i) the sum needed to pay out benefits which relate to service *prior to* the ***effective date*** ('past service'), and (ii) the sum needed to pay out those benefits which relate to service *after* the ***effective date*** ('future service').

B.16 For both parts of the calculation we adopt the same assumptions regarding the future service and progression of salaries of the Scheme members and the rate of return which would be earned by the capital sum if it were invested.

Past service position

B.17 In relation to the past service element, we compare the capital sum (or present value) relating to past service with the ***notional assets*** at the ***effective date***. If all the assumptions made during previous reviews had been borne out exactly, and assuming no errors in previous data sets are revealed, the ***notional assets*** would exactly equal the capital sum now needed to pay for those past service benefits. But, if actual events have differed from the assumptions made, then the ***notional assets*** will exceed, or fall short of, the capital sum now estimated to be needed.

B.18 To the extent that the ***notional assets*** are *less* than the capital sum needed to pay out all the benefits relating to past service, the fund is said to be in *deficit*. This deficit needs to be met by additional contributions. If the ***notional assets*** *exceed* the capital sum required for past service benefits, it is said to be in *surplus* and there would be a reduction in the contributions that would otherwise be paid for future service.

Future contributions

B.19 To calculate the ***uncorrected employer contribution rate***, we have calculated the percentage of total pensionable pay that would need to be paid to meet the benefits accrued over the four-year ***implementation period,*** deducted the member contributions and then adjusted to allow for the repayment of any surplus or deficit over 15 years. The adjustment in respect of surplus/deficit includes that identified at the ***effective date*** and that calculated to have arisen between the ***effective date*** and the ***implementation date***.

Employer contribution correction cost

B.20 The ***proposed employer cost cap*** is a measure of the cost of the 2015 Scheme.

B.21 The ***employer contribution correction cost*** is a measure of the costs associated with both the 2015 Scheme and the operation of the pre 2015 Schemes for members still in active service at the time the 2015 Scheme was introduced. The ***employer contribution correction cost*** has been compared to the ***target cost of the scheme***. The calculation of the ***employer contribution correction cost*** is similar to that of the ***uncorrected employer contribution rate*** but the future service elements of the calculations are based on all members being in the 2015 Scheme with assumptions reflecting members' likely behaviour had they never been members of the pre 2015 Schemes.

Appendix C: Summary of membership data and comparison with data at previous valuation

Table C1: Comparison of active membership as at 31 March 2012 and 31 March 2016

		2016					2012				
Rank	Gender	Number of members (000s)	Total pensionable pay (£m)	Average pensionable pay	Average age*	Average reck serv*	Number of members (000s)	Total pensionable pay (£m)	Average pensionable pay	Average age*	Average reck serv*
OF	Male	30	1,409	46,973	41	15	28	1,473	52,786	41	16
	Female	5	200	42,251	38	11	4	193	48,514	36	10
	Total	35	1,609	46,330	41	15	32	1,665	52,253	40	15
OR	Male	145	3,557	24,486	33	11	145	4,033	27,776	32	11
	Female	16	362	23,054	32	10	14	381	27,433	31	10
	Total	161	3,918	24,346	33	11	159	4,414	27,746	32	11
All	Male	175	4,966	28,336	35	12	173	5,506	31,806	34	12
	Female	20	562	27,501	34	10	18	574	32,121	32	10
	Total	196	5,528	28,249	35	12	191	6,080	31,836	34	12

*Weighted by pensionable pay

Table C2: Comparison of deferred membership as at 31 March 2012 and 31 March 2016

		2016				2012			
Rank	**Gender**	**Number of members (000s)**	**Total deferred pension (£m)**	**Average pension £**	**Average age***	**Number of members (000s)**	**Total deferred pension (£m)**	**Average pension £**	**Average age***
OF	**Male**	14	62	4,254	46	12	50	4,361	47
	Female	3	14	4,179	44	3	10	4,125	44
	Total	18	75	4,240	46	14	61	4,318	47
OR	**Male**	354	847	2,393	46	344	797	2,319	46
	Female	45	132	2,927	47	41	105	2,574	45
	Total	399	979	2,453	47	385	902	2,346	46
All	**Male**	368	909	2,466	46	355	847	2,385	46
	Female	48	146	3,012	46	44	116	2,665	45
	Total	417	1,054	2,529	46	399	963	2,415	46

*Weighted by deferred pension

Table C3: Comparison of pensioner and dependant membership as at 31 March 2012 and 31 March 2016

		2016					2012#			
		Number of members (000s)	**Total pension (£m)**	**Average Pension (£)**	**Average age***	**Total 2015 pension £m**	**Number of members (000s)**	**Total pension (£m)**	**Average Pension (£)**	**Average age***
OF	**Pre 2001**	23	456	19,560	74	0.0	39	603	15,303	73
	Post 2001	31	608	19,557	61	0.1	25	435	17,465	59
	Total	54	1,064	19,559	66	0.1	64	1,038	16,140	67
OR	**Pre 2001**	182	1,638	8,985	70	0.0	201	1,571	7,797	68
	Post 2001	163	1,128	6,904	56	0.4	115	739	6,445	53
	Total	346	2,767	8,001	65	0.4	316	2,310	7,306	63
	Pre 2001	206	2,094	10,184	71	0.0	241	2,174	9,025	69
All	**Post 2001**	195	1,737	8,927	58	0.4	140	1,174	8,410	55
	Total	400	3,831	9,573	65	0.4	380	3,348	8,799	64

*Weighted by pension
#Includes children's pensions

Appendix D: Notional assets and cashflows

D.1 The Directions specify the calculation of the ***notional assets*** (for both ***uncorrected employer contribution rate*** and ***employer contribution correction cost*** purposes) as at 31 March 2016[18]. The calculation of the ***notional assets*** for the whole Scheme (used for the ***uncorrected employer contribution rate)*** is set out in Table D1. Income and benefit payments have been derived from the Armed Forces Pension Scheme annual accounts for each year and the relevant information is summarised in Table D2. The notional return credited each year, in line with the return specified in the Directions which is summarised in Table D4, is also shown. Income and expenditure is assumed to occur mid-year for the purposes of crediting the notional return.

Table D1: Notional assets

	£ billion		Direction
Scheme Notional Assets at 31 March 2012	57.0	A	26(1)(b)
Plus Income Received	8.8	B	*25*
Less Benefits Paid	8.3	C	*25*
Plus Notional Investment Returns	11.1	D	*25*
Scheme Notional Assets at 31 March 2016 **A + B – C + D**	**68.5**		***25***

Table D2: Cashflows

	2012/13 £ billion	2013/14 £ billion	2014/15 £ billion	2015/16 £ billion
Income	2.0	1.9	1.9	2.9
Benefit payments	1.9	2.0	2.2	2.2
Notional investment returns [19]	3.0	3.5	2.7	1.9
(%)	5.3%	5.8%	4.2%	2.9%

D.2 Future cashflows to the Scheme will comprise income and benefit payments. The liabilities set out in this report are based on the overall cashflows expected to arise in all future years based on the assumptions used. Over shorter time periods it is likely that actual cashflows will differ from those taken into account when considering the longer term. Given the sensitivity of cashflow projections to particular time periods

[18] For the purpose of determining the ***employer contribution rate***, liabilities and notional assets for members whose pensions commenced before 1 April 2001, and their dependants, are excluded as required by Direction 27(2). The figures in this appendix are determined after this exclusion.
[19] Calculated in accordance with direction 25(4). In simple terms, the rate of return is the measure of price inflation (which can be negative) compounded with the net discount rate applying at the time.

they are required for, none are provided in this report. It is recognised that cashflow projections based on the valuation data may be required for other purposes.

D.3 The calculation of the ***notional assets*** for ***employer contribution correction cost*** purposes, referred to as the ***cost cap fund***, is based on the prior value of the ***cost cap fund*** as specified in the Directions. For this valuation an initial value of the ***cost cap fund*** has to first be determined. This has been calculated as the value of the liability for active members at 31 March 2015 using the assumptions set for the 2012 valuation (including those specified in the Directions issued for that valuation). The ***cost cap fund*** for this valuation is calculated by making adjustments to this initial value for income and benefit payments and a notional return is credited each year. A further adjustment, the cost cap Net Leavers Liability, is applied to allow for members leaving or rejoining contributory membership during the ***inter-valuation period***. These adjustments are made in a similar way to those for the whole Scheme ***notional assets*** but adapted to encompass only those payments which relate to the liabilities within the cost cap. The figures are set out in Table D3. Income and expenditure is assumed to occur mid-year for the purposes of crediting the notional return.

Table D3: Cost cap fund

	£ billion	***Direction***
***Initial cost cap fund* at 31 March 2015**	28.7	***30***
Plus ***cost cap income***	2.2	*33*
Less ***cost cap benefits paid***	(0.0)	*34*
Less ***cost cap net leavers liability***	(3.3)	*35*
Plus ***cost cap notional investment return***	0.7	*36*
Cost cap fund at 31 March 2016	28.3	***37***

D.4 For this valuation all income and expenditure relates to the year 2015/16.

Notional investment returns

D.5 The actual ***notional investment returns*** used to roll up the ***notional assets*** and the ***cost cap fund*** from the prior value to the ***effective date*** of the valuation are set out in Table D4 below.

Table D4: Notional investment returns

	Notional assets	**Cost cap fund**
2012/13	5.27%	N/a
2013/14	5.78%	N/a
2014/15	4.25%	N/a
2015/16	2.90%	2.30%

*To note the rate of roll up for 2015/16 is set differently for the ***notional assets*** and the ***cost cap fund***, as specified in the Directions.

Appendix E: Events since the 2012 actuarial valuation

Introduction of new scheme from 1 April 2015

E.1 A reformed Scheme, the 2015 Scheme, was introduced from 1 April 2015. The main difference compared to the previous arrangements was to provide benefits on a career average basis with deferred pension age linked to State Pension Age. Transitional arrangements were made under which older members remain in the pre 2015 Schemes to retirement. The benefits provided from the Schemes, together with a summary of the transitional provisions, are summarised in the Data report. As explained in the executive summary, there is ongoing litigation regarding the lawfulness of the transitional arrangements. The results in this report have been prepared in accordance with the benefits set out in the scheme regulations and under the approach specified in the amended Directions, as they apply at the date of signing.

Employer contributions

E.2 Employer contributions were paid at the rate of 32.1% of pensionable pay to 31 March 2015 and 50.4% since that date.

Assumption changes

E.3 Future life expectancy and the ***SCAPE discount rate*** used have had a major impact on the results of the valuation. Further information on these assumptions and how they impact on the results of the valuation are set out in paragraphs 2.16, 2.17 and 2.19.

Guaranteed Minimum Pension (GMP) increases

E.4 Members of public service schemes who reach State Pension Age on or after 6 April 2016 and before 6 April 2021 will receive the same rate of increase on all scheme pension including GMP. This was announced after completion of the 2012 valuation and the corresponding liability is included in this valuation for the first time.

E.5 The Government is considering the treatment of other GMP rights in the Scheme which may result in further liability being included in future valuations.

GMP Overpayments

E.6 Continuing GMP reconciliation work may result in identifying over or underpayments to members. We assume such payments will in aggregate not be material to the valuation.

Legal cases

E.7 In addition to the transitional protection legal case described in the executive summary, a number of other legal challenges, summarised below, have been brought against public service (and other) pension schemes since the 2012 valuation and final determinations are outstanding or impacts have yet to be agreed. Such determinations could impact future valuations but we have not made any allowance in the current valuation since the outcomes are unknown.

Brewster: nomination forms for survivor benefits

E.8 In February 2017, the Supreme Court ruled that a regulation requiring a signed nomination form from a member of the Northern Ireland Local Government Pension Scheme, in order to entitle an unmarried partner to survivor benefits in the scheme, was unlawful (the Brewster judgment). The Government has instructed all public service schemes to make appropriate amendments in light of this ruling. The impact of doing so has not been reflected in the data provided for the current valuation and no estimate of impact has been included.

Walker: survivor's pension payable to a surviving civil partner or same sex spouse

E.9 In July 2017, the Supreme Court handed down judgment in the case of Walker vs Innospec Ltd and others. The Supreme Court found that it is unlawful to restrict the survivor's pension payable to a surviving civil partner or same sex spouse so that it reflects only the member's pensionable service since 5 December 2005 (the date on which the Civil Partnership Act 2004 came into force). The Department is now taking forward the necessary steps to implement changes that ensure that surviving civil partners and surviving spouses of single sex marriages are treated in the same way as widows. No allowance has been made in the valuation results in respect of this ruling. The additional cost of providing pensions to surviving same sex civil partners/spouses equal to those of widows would not have a material impact on the valuation results.

Lloyds Banking Group: GMP equalisation

E.10 In October 2018, the High Court published its judgment in a case, brought by the pension trustees at Lloyds Banking Group, on equalisation of GMPs. They found that pensions must be equalised for the effects of unequal GMPs, and handed down guidance on how to do that in relation to the Lloyds Banking Group schemes. HM Treasury will consider the implications for the public service pension schemes, if any. No allowance has been made in the ***valuation results*** for any benefit changes required as a result of this ruling.

Pension increases and in-service revaluations

E.11 The actual rates of increase awarded to pensions in payment and to those in-service in the 2015 Scheme since the 2012 valuation are set out in Tables E1 and E2 respectively. The known rates of increase awarded since the ***effective date*** are also shown. These have been taken into account in the valuation.

Table E1: Pension increases since the previous valuation

Year	Pension Increase
April 2012	5.2%
April 2013	2.2%
April 2014	2.7%
April 2015	1.2%
April 2016	0.0%
April 2017	1.0%
April 2018	3.0%

Table E2: 2015 Scheme in-service revaluation since the previous valuation

Year	In-service revaluation
April 2016	2.00%
April 2017	2.60%
April 2018	3.00%

Appendix F: Summary of assumptions

F.1 The following tables show the financial assumptions, mortality assumptions and a summary of the other demographic assumptions. The financial assumptions, commutation take-up and rate of future improvements in life expectancy are specified in the Directions. The baseline mortality assumption and other demographic assumptions are set by the Secretary of State for Defence.

Table F1: Financial assumptions at current valuation and 2012 valuation

<table>
<tr><th></th><th colspan="4">31 March 2016</th><th colspan="4">31 March 2012</th></tr>
<tr><td>Discount rate</td><td colspan="4"></td><td colspan="4"></td></tr>
<tr><td>For liabilities and contribution rate</td><td colspan="4">2.8% pa real; 4.86% pa nominal until 2019 and then 2.4% pa real; 4.45% nominal</td><td colspan="4">3% pa real; 5.06% pa nominal</td></tr>
<tr><td>For cost cap rate</td><td colspan="4">2.4% pa real; 4.45% nominal</td><td colspan="4">3% pa real; 5.06% pa nominal</td></tr>
<tr><td>Pension increases</td><td colspan="4">2% pa</td><td colspan="4">2% pa</td></tr>
<tr><td>Long term salary growth</td><td colspan="4">4.2% pa, 2.2% pa in excess of assumed CPI</td><td colspan="4">4.75% pa, 2.75% pa in excess of assumed CPI</td></tr>
<tr><td rowspan="7">Earnings assumptions for CARE revaluations</td><td colspan="2">Date</td><td colspan="2">Assumption</td><td colspan="2">Date</td><td colspan="2">Assumption</td></tr>
<tr><td colspan="2">April 2019</td><td colspan="2">2.7%</td><td colspan="2">April 2016</td><td colspan="2">3.4%</td></tr>
<tr><td colspan="2">April 2020</td><td colspan="2">2.4%</td><td colspan="2">April 2017</td><td colspan="2">3.6%</td></tr>
<tr><td colspan="2">April 2021</td><td colspan="2">2.5%</td><td colspan="2">April 2018</td><td colspan="2">3.7%</td></tr>
<tr><td colspan="2">April 2022</td><td colspan="2">2.8%</td><td colspan="2">April 2019</td><td colspan="2">3.7%</td></tr>
<tr><td colspan="2">April 2023</td><td colspan="2">3.0%</td><td colspan="2">Thereafter</td><td colspan="2">4.75%</td></tr>
<tr><td colspan="2">Thereafter</td><td colspan="2">4.2%</td><td colspan="2"></td><td colspan="2"></td></tr>
<tr><td rowspan="8">Short term variations in assumptions</td><td>Year</td><td>Gross discount rate</td><td>Pension increases</td><td>Salary growth</td><td>Year</td><td>Gross discount rate</td><td>Pension increases</td><td>Salary growth</td></tr>
<tr><td>2016/17</td><td>3.83%</td><td>1.0%[20]</td><td>1.2%</td><td>2012/13</td><td>5.27%</td><td>2.2%</td><td>1.8%</td></tr>
<tr><td>2017/18</td><td>5.88%</td><td>3.0%[21]</td><td>2.2%</td><td>2013/14</td><td>5.78%</td><td>2.7%</td><td>0.5%</td></tr>
<tr><td>2018/19</td><td>5.06%</td><td>2.2%</td><td>2.1%</td><td>2014/15</td><td>5.27%</td><td>2.2%</td><td>1.5%</td></tr>
<tr><td>2019/20</td><td>4.24%</td><td>1.8%</td><td>2.3%</td><td>2015/16</td><td>5.16%</td><td>2.1%</td><td>2.0%</td></tr>
<tr><td>2020/21</td><td>n/a</td><td>n/a</td><td>2.6%</td><td>2016/17</td><td>n/a</td><td>n/a</td><td>2.5%</td></tr>
<tr><td>2021/22</td><td>n/a</td><td>n/a</td><td>2.8%</td><td>2017/18</td><td>n/a</td><td>n/a</td><td>3.0%</td></tr>
<tr><td>2022/23</td><td>n/a</td><td>n/a</td><td>3.0%</td><td>2018/19</td><td>n/a</td><td>n/a</td><td>3.0%</td></tr>
</table>

[20] Order made for 2016/17.
[21] Order made for 2017/18.

Table F2: Mortality assumptions

	2016 valuation		2012 valuation[22]		
Baseline mortality	**Standard table[23]**	**Adjustment**	**Standard table**	**Officer Adjustment**	**Other Rank Adjustment**
Retirements in normal health	S2PXA	110%	S1NXA	88%	118%
Current ill-health pensioners	S2PXA	110%	S1NXA	88%	118%
Future ill-health pensioners	S2PXA	110%	S1NXA	88%	118%
Dependants	S2PXA	110%	S1NXA	88%	118%

F.2 Future mortality improvements are in line with the most recent ONS principal population projections for the UK at the date of each valuation: ONS-2016 projections for the 2016 valuation and ONS-2012 projections for the 2012 valuation.

[22] The 2012 valuation assumptions differentiated between officers and other ranks. The equivalent single assumption would have been 110% of S1NXA tables.

[23] SAPS (S2) tables are published by the Actuarial Profession and based on the experience of self-administered pension schemes over the period 2004 to 2011. The S2 series has separate standard tables based on experience of members retiring in normal health (S2NXA), in ill health (S2IXA), combined normal and ill health (S2PXA) and for widows (S2DFA).

Table F3: Other demographic assumptions

Assumption	Summary of assumption
Age retirement AFPS 75/05 and other transitionally protected members	Age-dependent rates, with significant allowance for retirements at IP/EDP points and all retiring by age 55.
New entrants to AFPS 15	Age-dependent rates, with significant allowance for retirements at EDP point and all retiring by age 60.
AFPS 75/05 and other unprotected members	Gradual change between protected and new entrant patterns above
Ill-health retirement Incidence	Age-dependent rates, separate for officers and other ranks
Split by tier	50% on Tier 1; 25% on Tier 2; 25% on Tier 3
Withdrawal	Age-dependent rates across all schemes, separate for officers and other ranks
Death before retirement	70% of rates from UK Interim Life Tables
Promotional salary scale	Age-dependent scales, separate for officers and other ranks. Separate scales for 'representative pay' used to calculate AFPS 75 benefits.
Commutation	
New entrants to AFPS 15	In line with centrally set assumption set out in the Directions. No inverse commutation of EDP lump sum.
AFPS 75 and AFPS 05 unprotected	AFPS 15 pension: in line with centrally set assumption. AFPS 75 and AFPS 05: zero commutation. No inverse commutation of EDP lump sum.
Family statistics Proportion married	Officers: 90% (M), 65% (F) at retirement Other ranks: 80% (M), 60% (F) at retirement Consistent assumptions for existing pensioners
Proportion married/partnered[24]	All percentages above increased by 5% of members at retirement (consistent assumptions for existing pensioners)
Age difference	Male member 3 years older than partner Female 3 years younger than partner
Remarriage and children's pensions	No allowance

[24] In AFPS75, dependants' benefit are only paid to legal spouses. In APFS05 and the 2015 scheme, benefits may also be paid to other cohabiting partners who were financially dependent or interdependent.

F.3 The other demographic assumptions detailed in Table F3 are the same as used in the 2012 valuation except for the following:

- the proportion of ill-health retirements on Tier 1 has been slightly increased and the Tier 2/3 split has been shifted towards Tier 2;
- the promotional salary scale for other ranks' pensionable pay has been reduced to 85% of the 2012 scale; and
- the proportion married assumption for male other ranks has been reduced from 85% to 80%.

F.4 Full details of the demographic assumptions are provided in the Assumptions report.

F.5 The Directions require us to provide the average expected future pensionable service of the Scheme members in service at the ***effective date***. This is shown below, along with the average duration of liabilities for active members and current pensioners (which gives an indication of the timing of future cashflows).

Table F4: Duration and average future working lifetime

Member Type	Average expected future pensionable service (years)	Duration of liabilities (years)
Active Member	9.4	25.5
Current Pensioner	N/A	14.3

F.6 The Directions require this report to provide the pensionable payroll for the Scheme at the ***effective date*** and that projected to the ***implementation date*** and the final day of the ***implementation period***. These are shown below.

Table F5: Projected Pensionable Payroll

Date	Pensionable Payroll (£ **billion**)
Effective date (31 March 2016)	5.5
First year of implementation period (2019/20)	5.9
Last year of implementation period (2022/23)	6.4

Appendix G: Location of material required by Directions

Direction	Description	Location
21 (1) (a) (i) and (ii)	Summary of membership data and checks carried out	Data report.
21 (a) (iii)	Adjustments made to data Projections made	Data report. Assumptions report.
21 (1) (b)	Average age of active members	Appendix C1, Table C1
21 (1) (c)	Average expected future pensionable service of active members	Appendix F, Table F4
21 (1) (d)	Total projected pensionable payroll	Appendix F, Table F5
21 (1) (e)	Statement of compliance with Directions	Section 2, Paragraph 2.3
21 (1) (f)	Summary of regulations, Directions and professional standards	Section 2, Paragraphs 2.1 and 2.5 Appendix I GAD website
21 (1) (g)	Summary of main provisions of the schemes	Data report.
21 (1) (h)	Analysis of demographic experience	Assumptions report.
21 (1) (i) (i) and (ii)	Statement of assumptions, including rationale	Section 2, Paragraph 2.4 Assumptions report. See also Appendix F
21 (1) (i) (iii)	Illustration of sensitivity to assumptions set by the Secretary of State	Section 4, Table 4.1
21 (1) (j)	Other liabilities valued	None
21 (1) (k)	Any other matters scheme actuary feels relevant	None
21 (2)	Illustration of sensitivity to specific assumptions set in the Directions	Section 4, Table 4.1
22 (a), (b)	Valuation balance sheet	Section 3, Table 3.1
22 (c)	Notional asset cashflows	Appendix D, Table D2
22 (d), (e), (f), (g)	Contribution rates	Appendix A, Table A1

26 (1) (b)	Notional assets at previous valuation	Section 3, Table 3.1
26 (2) (b)	Change in notional assets since previous valuation	Appendix D, Table D1
27 (1)	Breakdown of contribution rate	Appendix A, Table A1
28 (a)	Member contribution yield between effective and implementation date	Appendix A, Table A1
28 (b)	Employer contribution yield between effective and implementation date	Appendix A, Table A1
28 (c)	Member contributions expected over implementation period	Appendix A, Table A1

Appendix H: Glossary

H.1 This report contains several terms with which you may not be familiar. Many of these terms come directly from the Directions or are specified in regulations, and paragraph 2 of the Directions gives some explanation of their meaning. This appendix is not intended to repeat the definitions of these terms from the Directions, rather to add further information to aid understanding of some of those terms and some other general pensions terms.

Terms relating to the calculation of the employer contribution correction cost

H.2 The ***employer contribution correction cost*** means the contribution rate which is compared against the ***target cost of the scheme*** at the first and each subsequent valuation of a scheme. It is calculated in four parts:

- The cost in respect of future service over the ***implementation period*** (H14), calculated as if all active members are in the 2015 Scheme and have no pre 2015 Scheme service; plus

- the cost in respect of past service, which is the difference between the ***cost cap fund*** (H4) and the ***cost cap liabilities*** (H5) converted to a contribution rate payable over 15 years; minus

- the ***cost cap contribution yield***, which is the expected average contribution rate payable by members over the implementation period; minus

- the ***cost cap difference***, which is the difference between the employer cost cap as set out in regulations and the ***proposed employer cost cap*** (H3) which would have been calculated in 2012 had updated financial assumptions been assumed. It acts to remove the impacts of changing the discount rate and long term earnings assumptions from the cost cap mechanism (in accordance with the policy aim contained in HM Treasury's actuarial valuation and employer cost cap mechanism policy document[25]).

H.3 The ***proposed employer cost cap*** is the contribution rate, that was determined at the 2012 valuation, to cover the cost of benefits accruing over the ***implementation period*** as if all active members were in the 2015 Scheme and had no pre 2015 Scheme service, minus the expected average contribution rate payable by members over the implementation period.

25 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/289366/public_service_pensions_actuarial_valuations_130314.pdf

H.4 The ***cost cap fund*** is a notional amount of money, initially set as the value at 31 March 2015 of the active members' past service liabilities. It has been updated to 31 March 2016 to take account of ***cost cap income*** (H6), ***cost cap benefits paid*** (H8), ***cost cap net leavers liabilities*** (H9) and ***cost cap notional investment returns*** (H10).

H.5 The ***cost cap liabilities*** are the value of the past service liabilities for all active members of the Scheme and all deferred and pensioner members of the 2015 Scheme as at the valuation date.

H.6 The ***cost cap income*** represents money received by the Scheme for example through employee contributions and transfer values received to the scheme. Employer contributions are also included, but these are set as the amount that would have been received if employer contributions were paid at the ***cost cap fund contribution rate*** (H7).

H.7 The ***cost cap fund contribution rate*** is the contribution rate required to cover the cost of benefits accruing to members of the Scheme from 1 April 2015 to 31 March 2016 less member contributions. It is calculated under the same updated assumptions as are used in the calculation to determine the ***cost cap difference***.

H.8 The ***cost cap benefits paid*** are the pension and lump sum benefits, and transfer and other sums paid out to members of the 2015 Scheme. At the current valuation this figure is very small due to the low number of 2015 Scheme pensioners and outgoing transfers involving 2015 Scheme benefits.

H.9 The ***cost cap net leavers liabilities*** are liabilities relating to benefits accrued in one of the pre 2015 schemes by members who have left, or re-joined, active service in the Scheme since the previous valuation. This item is needed because the cost cap mechanism only captures costs relating to pre 2015 Scheme benefits while members are in active service and so such liabilities need to be removed from the ***cost cap fund*** (H4) when pre 2015 Scheme members cease active service (or added back in of they re-join).

H.10 The ***cost cap notional investment returns*** are notional amounts added to ***the cost cap fund*** (H4) which represent the returns that might have been received on the ***cost cap fund*** (H4), the investment returns are set in line with the ***SCAPE discount rate*** (H19).

General valuation terms

H.11 The ***uncorrected employer contribution rate*** is the calculated percentage of pensionable pay that the employer will need to pay to the Scheme over the ***implementation period*** (H14) in respect of active members of the Scheme to cover the cost of benefits accruing over the ***implementation period*** and includes allowance for any surplus or shortfall.

H.12 The ***corrected employer contribution rate*** is calculated in the same way as the ***uncorrected employer contribution rate*** except that the accrual rate of the 2015 Scheme is assumed to be improved from 1 April 2019 to the extent necessary such that the ***employer contribution correction cost*** equals the ***target cost of the scheme***.

H.13 The ***employer contribution correction cost*** is a measure of how the cost of the scheme has changed relative to the ***target cost of the scheme***.

H.14 ***The implementation period*** for this valuation is 1 April 2019 to 31 March 2023.

H.15 The ***inter-valuation period*** is the four year period 1 April 2012 to 31 March 2016.

H.16 The ***notional assets*** are a notional amount of money, initially set as the value of all members' past service liabilities at a specific date (as set out in Schedule 2 of the Directions). It is updated at each valuation to take account of all actual Scheme income and benefits paid, plus an allowance for notional investment returns which are set in line with the ***SCAPE discount rate*** (H19).

H.17 Past service liabilities are the benefit promises (pensions, lump sums, survivor pensions etc) that have been made to members over their period of active membership of the Scheme prior to the ***effective date*** of the valuation. For active members, these liabilities include allowance for future salary inflation or in-service benefit revaluation until the assumed date of cessation of pensionable service.

H.18 ***Pensionable pay*** is the part of pay that is included for the purposes of determining contribution requirements and benefit payments.

H.19 The term SCAPE is short for the Superannuation Contributions Adjusted for Past Experience. The ***SCAPE discount rate*** is the Government's measure for determining the present value of future payments. It is currently set equal to the rate of expected long-term GDP growth. Further detail can be found in in the consultation documentation published by HM Treasury in December 2010 and April 2011[26].

[26] https://www.gov.uk/government/consultations/the-discount-rate-used-to-set-unfunded-public-service-pension-contributions

Appendix I: Limitations

I.1 This report is intended solely for the use of the Secretary of State for Defence and Ministry of Defence. It sets out the calculated ***uncorrected employer contribution rate*** effective over the period 1 April 2019 to 31 March 2023. It also sets out the ***employer contribution correction cost*** and compares this to the ***target cost of the scheme***. The information and advice in this report should not be relied upon, or assumed to be appropriate, for any other purpose or by any other person. GAD does not accept any liability to third parties, whether or not GAD has agreed to the disclosure of its advice to the third party

I.2 We are content for the Secretary of State for Defence to release this report to third parties, provided that:

- it is released in full;
- the advice is not quoted selectively or partially;
- GAD is identified as the source of the report, and;
- GAD is notified of such release.

I.3 Third parties whose interests may differ from those of the Secretary of State for Defence should be encouraged to seek their own actuarial advice where appropriate. GAD has no liability to any person or third party for any act or omission taken, either in whole or in part, on the basis of this report.

I.4 GAD is not responsible for any decision taken by the Ministry of Defence, except to the extent that the decision has been made in accordance with specific advice provided by GAD. Advice provided by GAD must be taken in context and is intended to be read and used as a whole, not in parts. GAD does not accept responsibility for advice that is altered or used selectively. No significant action should be taken based on oral advice alone. Clarification should be sought if there is any doubt about the intention or scope of advice provided by GAD.

I.5 GAD relies on the accuracy of data and information provided by Defence Business Services (DBS). GAD does not accept responsibility for advice based on wrong or incomplete data or information provided by Defence Business Services (DBS) or the Ministry of Defence. Some aspects of the data were incomplete and/or unreliable for certain elements of our valuation calculations. Details are provided in the Data report.

I.6 This work has been carried out in accordance with the applicable Technical Actuarial Standards: TAS 100 and TAS 300 issued by the Financial Reporting Council (FRC). The FRC sets technical standards for actuarial work in the UK.

I.7 Throughout this report the totals given for summed data may not be exactly the same as the sum of the components shown due to rounding effects.