Government Actuary's Department

Principal Civil Service Pension Scheme

Valuation as at 31 March 2012

Report on methodology

Date: 14 July 2014

Author: Nick Horne and Sandra Bell

Contents

1 Introduction

1.1 This report is addressed to the Cabinet Office. This report should not be reproduced or disseminated to other parties without prior consent. The Government Actuary's Department (GAD) does not accept any liability to third parties, whether or not it has agreed to the disclosure.

1.2 The purpose of this report is to summarise the methodologies adopted for certain aspects of the valuation calculations. It also explains why the approaches taken are necessary and the impact of the approaches taken on the valuation result.

1.3 The data and assumptions to be used for the valuation are the subject of separate reports.

1.4 This report was also made available in draft to the Governance Group as part of the consultation process relating to the actuarial valuation of the PCSPS as at 31 March 2012.

1.5 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.

1.6 Appendix B outlines the information which was provided to HM Treasury (HMT) to assist with their review of the methodology issues which are not covered directly by the HMT valuation directions[1].

[1] HM Treasury's *The Public Service Pensions (Valuations and Employer Cost Cap) Directions 2014*

2 Grouping of individual active member records

2.1 Individual active members have been grouped together for the purposes of calculating liabilities. This grouping is necessary to accommodate the volume of data within our valuation system. The membership is grouped according to section (Classic, Premium etc.), salary band, gender, State Pension Age (SPA), and member's protected status (fully protected, taper protected or unprotected). Within those larger groups the membership is then grouped by age (to nearest birthday) and service (to nearest whole year).

2.2 The tables below shows the total number of individual records and the number of grouped records used for calculation purposes. The totals may not match the sum of the numbers above due to rounding.

Table 2.1 – Number of records for Protected Members

Section	Salary band	Individual records	Grouped records	Individual records	Grouped records
		Males		Females	
Classic	**1**	12,985	945	26,550	933
	2	38,202	965	34,343	916
	3	8,273	712	3,615	588
	4	1,143	393	424	229
Prison Officers		2,720	414	200	112
Classic Plus	**1**	478	291	664	315
	2	1,590	522	1,115	389
	3	647	303	260	178
	4	109	84	46	36
Premium	**1**	7,294	619	9,325	567
	2	10,149	710	5,459	569
	3	2,555	580	1,103	391
	4	570	288	170	133
Nuvos	**1**	2,669	122	1,819	117
	2	1,805	137	576	97
	3	344	101	111	57
	4	134	68	41	34
Total		**91,666**	**7,254**	**85,821**	**5,661**

Table 2.2 - Number of records for Tapered Members

Section	Salary band	Individual records	Grouped records	Individual records	Grouped records
		Males		Females	
Classic	**1**	3,356	135	8,938	139
	2	13,985	145	15,472	143
	3	2,915	118	1,885	126
	4	269	84	146	70
Classic Plus	**1**	139	66	264	92
	2	590	91	635	106
	3	200	68	163	68
	4	20	15	13	12
Premium	**1**	1,537	106	3,277	127
	2	3,523	130	2,803	125
	3	785	120	511	105
	4	144	66	71	47
Nuvos	**1**	1,063	33	1,449	49
	2	1,178	50	552	44
	3	289	45	133	41
	4	96	25	29	18
Total		**30,088**	**1,296**	**36,342**	**1,312**

Table 2.3 - Number of records for Unprotected Members

Section	Salary band	Individual records	Grouped records	Individual records	Grouped records
		Males		Females	
Classic	**1**	11,588	477	28,035	501
	2	33,663	467	40,757	487
	3	5,357	344	4,475	355
	4	343	148	197	110
Classic Plus	**1**	494	187	1,009	270
	2	1,614	226	2,136	290
	3	450	155	477	178
	4	36	29	27	19
Premium	**1**	11,986	448	21,147	460
	2	22,593	464	23,358	465
	3	3,940	357	4,065	348
	4	254	136	202	125
Nuvos	**1**	14,827	289	20,444	333
	2	15,670	447	14,416	413
	3	2,228	307	2,147	276
	4	312	116	190	93
Total		**125,354**	**4,607**	**163,082**	**4,723**

3 Active membership projections

3.1 The Directions require the actuary to calculate the cost of benefits accruing over the periods 1 April 2012 to 31 March 2015 and 1 April 2015 to 31 March 2019.

3.2 In addition to the assumptions used, the main factors affecting the expected cost of the benefits are:

(i) The scheme benefits being accrued by members; and

(ii) The profile of the active membership over these periods.

3.3 The former is particularly important due to the changes being introduced on 1 April 2015 as a result of the reform of the PCSPS. The expected cost of benefits provided to members remaining in the existing scheme differs from the expected cost of providing those members with benefits in the 2015 scheme. Further, the expected cost of providing benefits varies for members with differing benefit provisions within the existing scheme (notably for members within each section of the scheme, ie Classic, Premium and Nuvos sections).

3.4 The Directions therefore implicitly require the actuary to determine the expected active membership up to 31 March 2019 in order to determine the valuation results. However, for a practical application of the methodology we have focussed on the membership of the Scheme as at 31 March 2015, 1 April 2015[2] and 31 March 2019.

Approach to determining the active membership of the PCSPS as at 31 March 2015 and 31 March 2019

3.5 The valuation system does not directly allow for the run off of members from the various categories and replacement with new entrants. Because of this it is necessary to separately project the membership within each scheme and benefit category at the valuation date to the start and end of the implementation period (1 April 2015 to 31 March 2019) to enable the valuation results to be calculated.

3.6 There are two main alternative approaches which could be used to determine the active membership at future dates:

(i) Assume the active population remains relatively stable by total salary roll at each age. Appropriate adjustments would be made to allow for the transfer of members to the 2015 scheme.

(ii) Project forward the 31 March 2012 data and allow for expected changes in the workforce at future dates.

[2] The active membership will essentially be the same on both 31 March 2015 and 1 April 2015. The difference is that unprotected members will transfer across to the 2015 scheme on 1 April 2015. For the purpose of this report, any reference to data as at 31 March 2015 also applies to the data as at 1 April 2015.

3.7 Over recent years there has been a fall in the number of civil servants and the expectation is that this reduction will continue for a number of years. As such, it is not appropriate to assume that the active membership will remain stable over the period 1 April 2012 to 31 March 2019.

3.8 The active membership therefore needs to be projected to 31 March 2015 and 2019 in order to determine the active membership at these dates. This requires three components:

> Determine the expected active membership as at 31 March 2015 and 31 March 2019.

> Project the 2012 active membership to 31 March 2015 and 31 March 2019.

> Add in expected new joiners over the period 2012-2015 and 2015-2019.

Total membership as at 31 March 2015 and 31 March 2019

3.9 The overriding assumption made in projecting the membership is that over the period from the valuation date to the end of the implementation period the overall membership (for the combined existing and 2015 schemes) will reduce in line with the allowance made by Cabinet Office in their OBR forecasts.

Table 3.1: Assumed change in workforce in each year

2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
-5.8%	-3.0%	-4.3%	-4.4%	-1.3%	0.0%	0.0%

Projecting the active membership data to 31 March 2015 and 31 March 2019

3.10 We have assumed that the demographic assumptions recommended for the valuation will be applicable for the period to the end of the implementation period. The current membership is therefore projected to leave in line with the valuation assumptions adopted for normal health retirements, ill-health retirements, withdrawals and death in service over this period. These assumptions were set based on recent experience of the Scheme and therefore represent the best estimate of future movements in the scheme.

3.11 In order to achieve the required size of membership at the start and end of the implementation period which is consistent with the rates outlined in Table 3.1 above, we have needed to make an explicit assumption about the profile of new joiners to the scheme over the period from the valuation date to the end of the implementation period.

New joiners to the PCSPS

3.12 The profile of new entrants (in terms of age, gender and salary) has been assumed to be consistent with the profile of recent entrants to the PCSPS (based on the data provided for the 2012 valuation). We have added the proportion of recent new entrants required to match the overall projected workforce numbers at the start and end of the implementation period. Salaries for new entrants are assumed to be consistent with the salaries for recent new entrants as at 31 March 2012 increased in line with general pay awards.

3.13 Our membership projections are therefore consistent with the Cabinet Office's OBR projections in relation to the expected change in workforce. However, the payroll forecasts are different as GAD assumes that the payroll will increase in line with the short-term salary increases outlined in the HMT valuation directions and the PCSPS assumption for promotional pay progression. The Cabinet Office's OBR projections make allowance for general salary increases plus pay drift which combined is similar to the short-term salary increases outlined in the HMT valuation directions in most years but they do not make explicit allowance for promotional pay progression.

3.14 The distribution of the membership at the valuation date and at the start and end of the implementation period by headcount and pay is as shown in the charts below. "NPA 60" represents the final salary sections of the existing PCSPS (ie Classic, Premium and Classic Plus). "NPA 65" shows the membership of the Nuvos section.

Chart 1A: 2012 membership profile by headcount

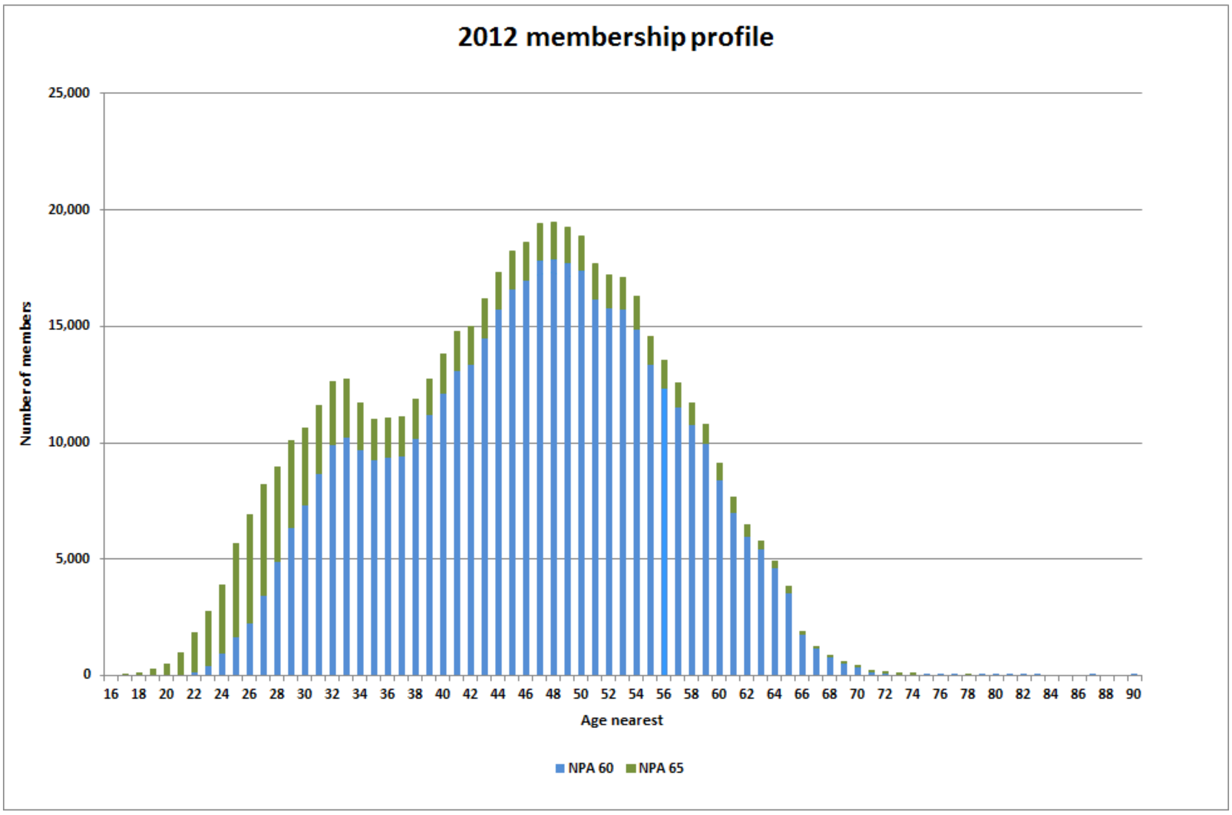


Chart 1B: 2012 membership profile by pay

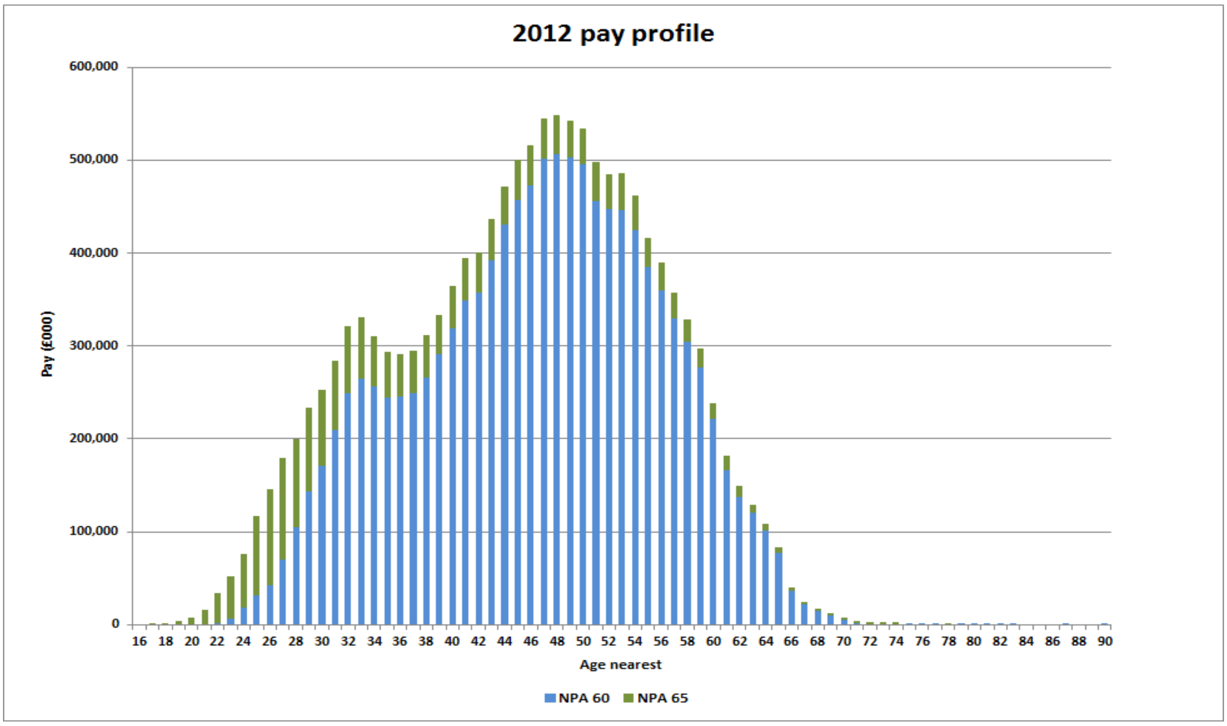


Chart 2A: 2015 membership profile by headcount

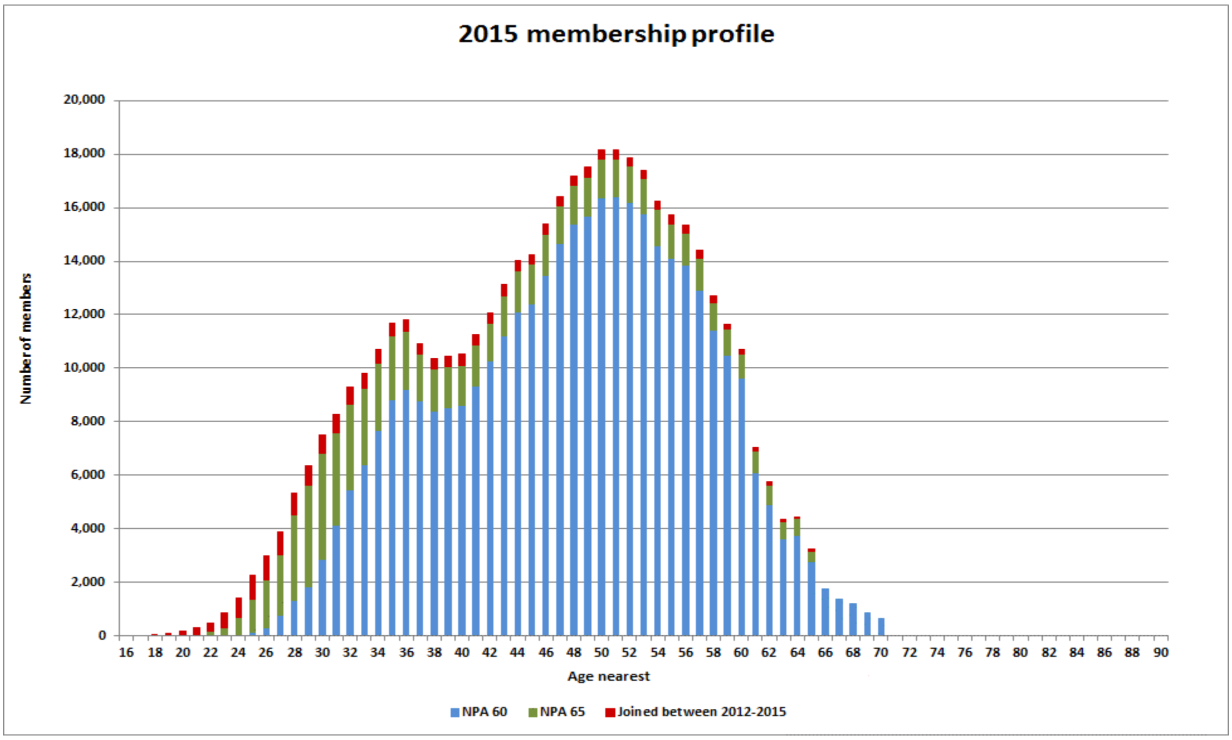


Chart 2B: 2015 membership profile by pay

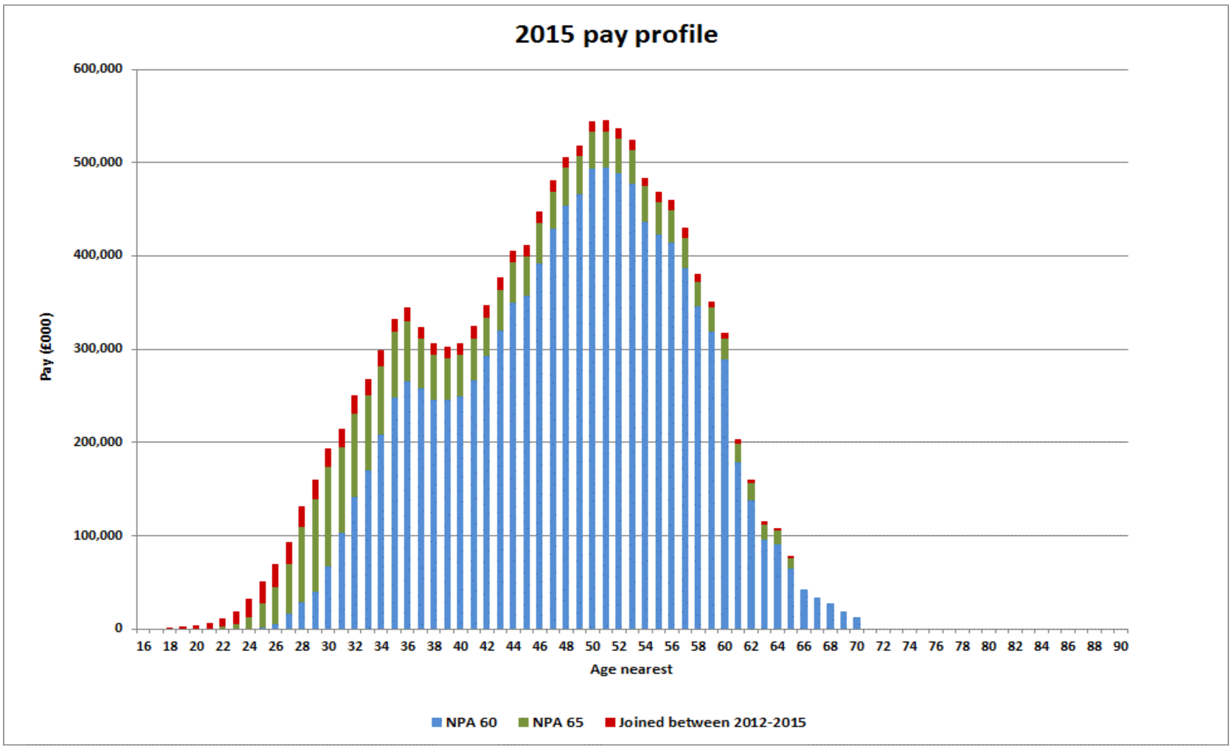


Chart 3A: 2019 membership profile by headcount

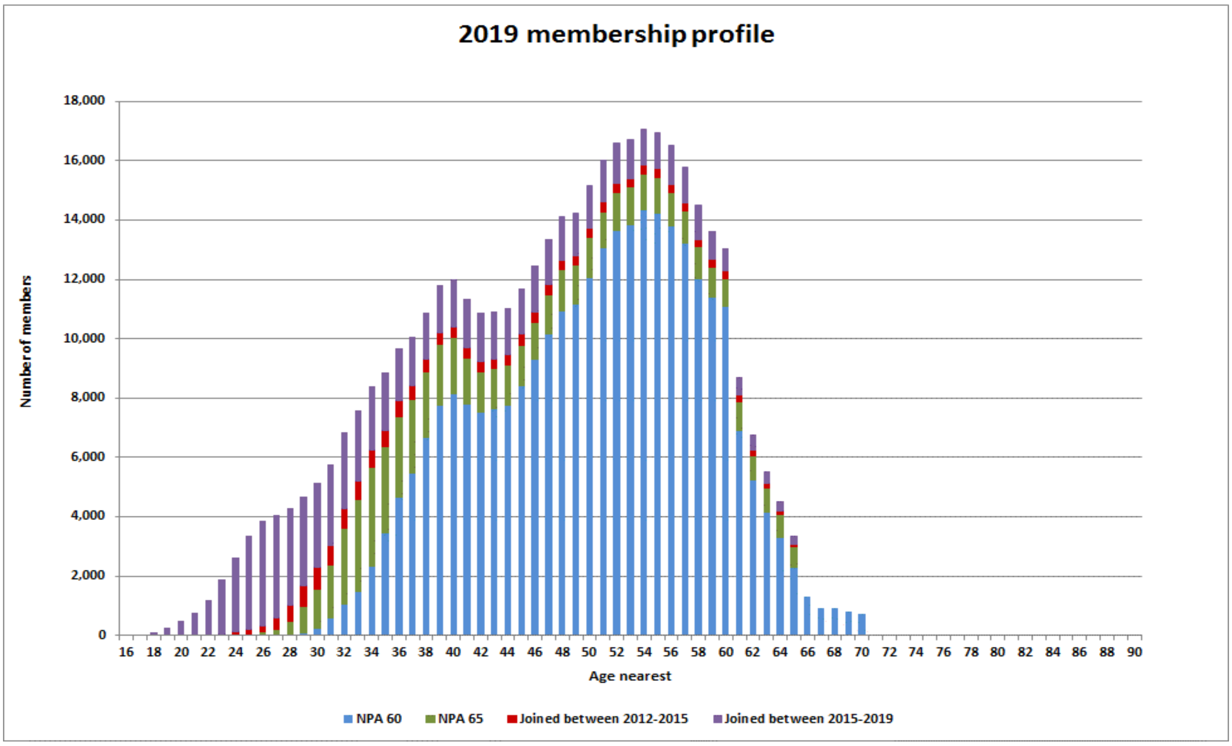
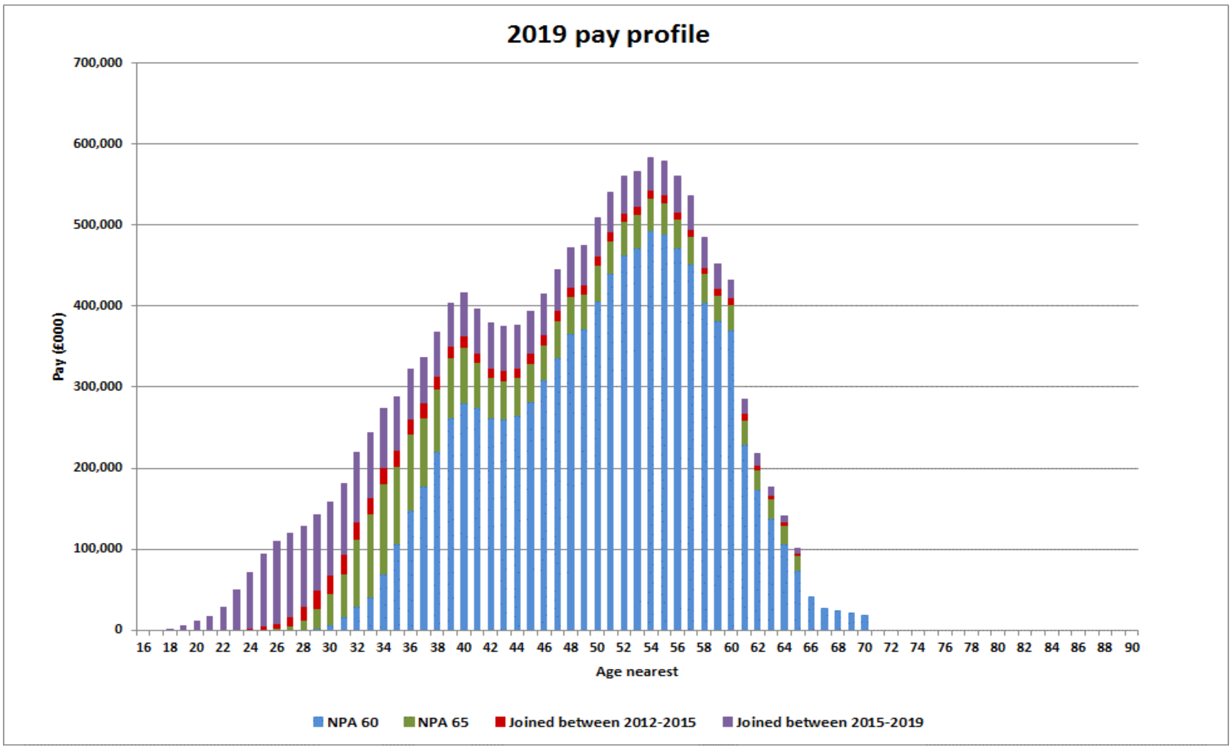


Chart 3B: 2019 membership profile by pay



3.15 The resultant proportions of payroll in each level of protection as at the start and end of the implementation period are shown below together with the proportions at the valuation date. Also shown is the average age of each group of members.

Table 3.2: Projected payroll

	31 March 2012		*1 April 2015*		*31 March 2019*	
	Proportion of payroll	**Average age***	**Proportion of payroll**	**Average age***	**Proportion of payroll**	**Average age***
Unprotected* **	52.4%	37.4	58.6%	40.3	79.0%	44.0
Tapered protection**	13.3%	48.6	13.6%	51.6	5.1%	56.6
Fully protected	34.2%	56.0	27.8%	57.9	16.0%	60.5

* weighted by pay
** no allowance has been made in the table for tapered members taking up the option to transfer immediately to the 2015 scheme
*** the 31 March 2019 unprotected figures include members who had tapered protection which ended before 31 March 2019

3.16 Based on a total payroll of approximately £14.0bn as at 31 March 2012, the total payroll (in 2012 terms) is projected to be approximately £12.9bn at 31 March 2015 and £12.6bn at 31 March 2019.

Projecting the membership beyond 31 March 2019

3.17 The Scheme membership as at 31 March 2019 is assumed to be in line with the OBR forecasts (see paragraph 3.9) with the total salary roll for 2019/20 determined in accordance with paragraph 3.13. After 2019/20, the total salary roll is assumed to increase in line with general salary increases set out in Direction 17. The salary roll up to 31 March 2030 is required to determine the deficit contributions payable under Direction 27(1)(a) and (c).

Membership projections for the employer cost cap

3.18 The same membership projections are used for the cost of accrual over 2015-19 (Direction 27(1)(d)) and the proposed employer cost cap (Direction 53).

4 Option exercise for members with tapered protection

4.1 Scheme members who, as of 1 April 2012, have 10 years or less to their current Normal Pension Age (NPA) will remain in the existing scheme up to and including the point at which they draw their pension rights.

4.2 Members who have between 10 and 13.5 years to their current Normal Pension Age (NPA) will be offered a choice to have an additional degree of protection, in the form of further accrual in their existing schemes. This protection will be tapered in a linear fashion depending on the age of the member. More details of this protection are provided in Appendix A.

4.3 As noted above, scheme members who are subject to tapered protection will be offered the option of transferring into the 2015 scheme on 1 April 2015 rather than remaining in the existing scheme for their protected period.

4.4 In order to determine the contribution rates required under Direction 27 of HMT valuation directions we need to make an assumption about the proportion of members who will opt to join the 2015 scheme immediately.

4.5 On discussion with the Governance Group it was noted that the main factor which is likely to influence a member's decision is the size of benefit which would be accrued under each option. We have therefore undertaken a simplified analysis to compare the benefit expected to accrue to each member covered by tapered protection over the whole of their expected period of protection. The conclusions are heavily influenced by assumed retirement pattern, assumed salary growth over the period and the early retirement terms which would apply under the 2015 scheme. For the purpose of these calculations we have assumed that members will retire in line with the 2012 valuation assumption for age retirement and that early retirement reduction will be in line with those currently adopted in the Nuvos section.

4.6 Based on our calculations we propose to adopt the following as the assumed proportion of tapered members opting to join the post 2015 scheme immediately from 1 April 2015:

- For members of Classic, Premium and Classic Plus we propose to assume the proportions in Table 4.1.
- For Nuvos members we propose to assume that none opt for the 2015 scheme.

Table 4.1: Assumed proportion of tapered members in Classic, Premium and Classic Plus opting for 2015 scheme

	Males	Females
Salary Band 1	65%	45%
Salary Band 2	55%	40%
Salary Band 3	40%	40%
Salary Band 4	40%	35%

4.7 The approximate impact of alternative assumptions on the cost of benefits accruing in the scheme is outlined in Table 4.2 below.

Table 4.2: Approximate financial impact of proposed change in assumed proportion of members opting to join 2015 scheme with effect from 1 April 2015

	Impact on cost of accrual for Taper members only*	Impact on overall cost of accrual*
Assume all non-Nuvos members opt to transfer to the 2015 scheme immediately	+0.6% of pay	+0.1% of pay
Assume 25% of non-Nuvos members opt to transfer to the 2015 scheme immediately	+0.2% of pay	Immaterial

* Impact on cost of accrual relative to assuming that all members remain in the existing scheme for the full taper period.

4.8 As demonstrated above, the overall cost of benefits accruing in the scheme is not highly sensitivity to changes in the assumed proportion of members opting to join the 2015 scheme immediately from 1 April 2015.

5 Accrual cost methodology

5.1 As discussed in section 2 of this report, individual active members have been grouped together for the purpose of calculating liabilities. This grouping is necessary to accommodate the volume of data within our valuation system.

5.2 Direction 11 requires the use of the projected unit methodology to determine the valuation results.

5.3 When determining the costs of accrual as required by the Directions 27(1)(b), 27(1)(d) and 53(1), the cost has first been determined at the start and end of the relevant period based on the (projected) membership of the sections of the scheme and the applicable assumptions at those times. The overall cost of accrual for the period is then determined as the average cost of accrual at the start and end, weighted by the expected present value of the payroll at these times.

5.4 Directions 14, 16 and 17 specify some modifications to the financial assumptions in the short term. An implication of the short term modifications is that the projected unit methodology is expected to result in an increasing standard contribution rate over successive periods. For example the cost of accrual under the existing scheme is lower in 2012 than in 2015 (for a similar group of members). This effect is not immaterial for final salary benefits but has no effect on the cost cap calculation since short term assumptions are explicitly disregarded for this purpose in Direction 53.

5.5 Non-accruing benefits such as lump sums payable on death in service or enhancements payable on ill-health retirement or death in service are recognised only at the time of retirement or death.

6 Approximations

Guaranteed Minimum Pensions (GMPs)

6.1 The Scheme is not liable for the full indexation of GMPs and so makes savings on GMPs compared to the cost of providing a fully indexed pension. Individual GMP data could not be supplied for members where the GMP was not in payment and so the savings have been estimated in an approximate manner.

6.2 The approximation is based on the ratio of GMP to other pension for pensioners who are old enough for GMP to be in payment. This provides an indication of the total GMP that will have been accrued in the Scheme. The approximation is intended to be unbiased but its accuracy will be affected by changes in scheme size and earnings profile over the period of GMP accrual (1978-1997).

6.3 The total estimated savings are just over 1% of total liabilities and allowance for this serves to reduce the deficit contributions (assessed as being required for 15 years from 2015) by just under 1% of pay, compared with valuing all benefits as fully indexed pensions. Three quarters of the savings have been attributed to pensioner members with the rest split between actives and deferreds in line with the liabilities of those groups.

6.4 The estimation of the GMP savings has no impact on the calculation of the cost cap. Provided accurate GMP data is available as at 31 March 2015, the approximation will not apply to the starting value of the cost cap fund and so will not impact on the operation of the cost cap mechanism.

Earnings cap

6.5 For members joining PCSPS for pensionable service on or after 1 June 1989 pensionable pay is restricted to the 'earnings cap' unless they are members of the Nuvos section of the scheme (unless they have linked service). Due to the way in which individual active member data is grouped for valuation purposes it is not possible to directly restrict pay in the valuation system. However, there are very few such members of the scheme whose earnings are either already above the earnings cap or estimated to exceed the earnings cap by retirement. The earnings cap has therefore not been allowed for.

Public Service Transfer Club (PSTC) and re-joiner aggregation costs

6.6 Allowance will be made for the potential additional liabilities arising from inward transfers on PSTC terms. The volumes of transfers have historically been significant and if they continue at these levels the financial impact is expected to be material. The report in respect of the actuarial valuation as at 31 March 2007 (issued by Hewitt Bacon & Woodrow Limited and dated 7 December 2007) noted that an addition had been made to the value of future benefit accrual of 0.5% of pensionable pay, to cover the estimated costs arising from PSTC transfers-in and additional benefits arising due to linkage of service for re-joiners.

6.7 Allowance has been made for the potential costs of PSTC transfers by assuming that the level of transfers continues at recent levels and that the cost of providing the service credit is about twice the transfer value received. Overall, the additional costs are equivalent to about 0.3% of pensionable pay. HMT has confirmed that these costs also apply to the calculation of the cost cap.

6.8 In the longer term, PSTC transfers will increasingly be transfers of career average benefits. The exact form of these transfers and distribution of the costs involved has yet to be determined. However, it is likely that PSTC costs to the Scheme will fall over time.

6.9 Allowance has been made for the cost of the additional benefits arising when a member re-joins the PCSPS and links their current and previous periods of pensionable service. The cost has been estimated using an approximate approach based on the limited information available in respect of re-joiners to the PCSPS over the period since the previous actuarial valuation as at 31 March 2007. Overall, we estimate that the additional benefits arising are equivalent to about 0.2% of pensionable pay. These costs do not apply to the calculation of the cost cap.

6.10 Re-entry of current active members to pensionable service in future has been modelled by the use of a 'net' withdrawal assumption. This explicitly allows for a proportion of those leaving active service to return.

Expenses

6.11 The current employer contribution rate includes an additional 0.15% of pensionable pay in respect of the central administration expenses of the scheme. Allowance has been included in the employer contribution rate required from 2015 at the same level.

General pay increases

6.12 Pay increases are assumed to occur on 30 September each year in accordance with Direction 17, eg an increase of 1.8% on 30 September 2012.

Dependants' pensions

6.13 No allowance has been made for short term dependant pensions or children's pension (other than those already in payment), on grounds of immateriality.

State Pension Age

6.14 A member's Normal Pension Age in the 2015 scheme is set equal to the greater of 65 and their SPA. Direction 18 sets out the SPA to use for a member in the valuation calculations. Increases in SPA are not instantaneous. For example, someone born on 5 April 1960 has an SPA of 66 years, someone born on 5 October 1960 has an SPA of 66 years and 6 months, and someone born on 5 April 1961 has an SPA of 67.

6.15 For the purposes of the valuation calculations we have taken a pragmatic approach to calculate each member's SPA. Using the example above, anyone born between 5 April 1960 and 30 September 1960 is assumed to have an SPA of 66, and anyone born between 1 October 1960 and 5 April 1961 is assumed to have an SPA of 67. The same approach has been adopted for the transition between other SPAs. This approach will not have a material impact on the valuation results.

Early retirement factors

6.16 Allowance for early retirement from the existing scheme has been included within the withdrawal assumptions as early retirement is expected to be broadly cost neutral to a deferred benefit payable from normal pension age. For the 2015 scheme, early retirement has been explicitly modelled and early retirement factors have been adopted which are estimated to be broadly in line with the early retirement factors that are expected to apply in future. Any difference between the estimates applied and the actual scheme factors would not have a material impact on the valuation results.

Deferred members above NPA

6.17 All deferred members are assumed to claim their benefits. Those already above their NPA are assumed to claim their benefits immediately.

Appendix A: Tapered Protection

Scheme members in Classic and Premium who on 1 April 2012 are between 46 years and 6 months and 50 (or who are in Nuvos and aged between 51 years and 6 months and 55) will have a choice to continue to accrue additional pension in their existing schemes, on a tapered basis. They will accrue for two months in their existing schemes for every month they are older than 46 years and 6 months (51 years and 6 months for Nuvos), as set out in the table below.

Staff in this "tapering group" will be able to take their existing scheme benefits at their current NPA, including any additional accrual they build up post 2015. If they remained an active member after the transitional protection has ended, they would then begin to accrue benefits in the 2015 scheme, which would become payable in full from the NPA of the 2015 scheme (or taken early with an actuarial reduction).

Table 1: Tapering - Classic and Premium

Age at 1 April 2012		Age at 1 April 2015		Months of protection	Age at end of protection		Date of end of protection
year	month	year	month		year	month	
49	11	52	11	82	59	9	Feb-22
49	10	52	10	80	59	6	Dec-21
49	9	52	9	78	59	3	Oct-21
49	8	52	8	76	59	0	Aug-21
49	7	52	7	74	58	9	Jun-21
49	6	52	6	72	58	6	Apr-21
49	5	52	5	70	58	3	Feb-21
49	4	52	4	68	58	0	Dec-20
49	3	52	3	66	57	9	Oct-20
49	2	52	2	64	57	6	Aug-20
49	1	52	1	62	57	3	Jun-20
49	0	52	0	60	57	0	Apr-20
48	11	51	11	58	56	9	Feb-20
48	10	51	10	56	56	6	Dec-19
48	9	51	9	54	56	3	Oct-19
48	8	51	8	52	56	0	Aug-19
48	7	51	7	50	55	9	Jun-19
48	6	51	6	48	55	6	Apr-19
48	5	51	5	46	55	3	Feb-19
48	4	51	4	44	55	0	Dec-18
48	3	51	3	42	54	9	Oct-18
48	2	51	2	40	54	6	Aug-18
48	1	51	1	38	54	3	Jun-18
48	0	51	0	36	54	0	Apr-18
47	11	50	11	34	53	9	Feb-18
47	10	50	10	32	53	6	Dec-17
47	9	50	9	30	53	3	Oct-17

Age at 1 April 2012		Age at 1 April 2015		Months of protection	Age at end of protection		Date of end of protection
47	8	50	8	28	53	0	Aug-17
47	7	50	7	26	52	9	Jun-17
47	6	50	6	24	52	6	Apr-17
47	5	50	5	22	52	3	Feb-17
47	4	50	4	20	52	0	Dec-16
47	3	50	3	18	51	9	Oct-16
47	2	50	2	16	51	6	Aug-16
47	1	50	1	14	51	3	Jun-16
47	0	50	0	12	51	0	Apr-16
46	11	49	11	10	50	9	Feb-16
46	10	49	10	8	50	6	Dec-15
46	9	49	9	6	50	3	Oct-15
46	8	49	8	4	50	0	Aug-15
46	7	49	7	2	49	9	Jun-15
46	6	49	6	0	49	6	Apr-15

Table 2: Tapering – Nuvos

Age at 1 April 2012		Age at 1 April 2015		Months of protection	Age at end of protection		Date of end of protection
year	month	year	month		year	month	year
54	11	57	11	82	64	9	Feb-22
54	10	57	10	80	64	6	Dec-21
54	9	57	9	78	64	3	Oct-21
54	8	57	8	76	64	0	Aug-21
54	7	57	7	74	63	9	Jun-21
54	6	57	6	72	63	6	Apr-21
54	5	57	5	70	63	3	Feb-21
54	4	57	4	68	63	0	Dec-20
54	3	57	3	66	62	9	Oct-20
54	2	57	2	64	62	6	Aug-20
54	1	57	1	62	62	3	Jun-20
54	0	57	0	60	62	0	Apr-20
53	11	56	11	58	61	9	Feb-20
53	10	56	10	56	61	6	Dec-19
53	9	56	9	54	61	3	Oct-19
53	8	56	8	52	61	0	Aug-19
53	7	56	7	50	60	9	Jun-19
53	6	56	6	48	60	6	Apr-19
53	5	56	5	46	60	3	Feb-19
53	4	56	4	44	60	0	Dec-18
53	3	56	3	42	59	9	Oct-18

Age at 1 April 2012		Age at 1 April 2015		Months of protection	Age at end of protection		Date of end of protection
53	2	56	2	40	59	6	Aug-18
53	1	56	1	38	59	3	Jun-18
53	0	56	0	36	59	0	Apr-18
52	11	55	11	34	58	9	Feb-18
52	10	55	10	32	58	6	Dec-17
52	9	55	9	30	58	3	Oct-17
52	8	55	8	28	58	0	Aug-17
52	7	55	7	26	57	9	Jun-17
52	6	55	6	24	57	6	Apr-17
52	5	55	5	22	57	3	Feb-17
52	4	55	4	20	57	0	Dec-16
52	3	55	3	18	56	9	Oct-16
52	2	55	2	16	56	6	Aug-16
52	1	55	1	14	56	3	Jun-16
52	0	55	0	12	56	0	Apr-16
51	11	54	11	10	55	9	Feb-16
51	10	54	10	8	55	6	Dec-15
51	9	54	9	6	55	3	Oct-15
51	8	54	8	4	55	0	Aug-15
51	7	54	7	2	54	9	Jun-15
51	6	54	6	0	54	6	Apr-15

Appendix B: Copy of methodology summary provided to HMT 17 January 2014

Brief description of overriding assumption(s)	Overall change in workforce will be in line with OBR forecasts. New membership profile proportional to 2015 entrants leading up to 31/03/2012.
Rationale	• Workforce planning does not assume a stable payroll. Workforce currently projected to reduce up to 2017. • New entrants assumption based on recent experience.
Payroll at 31/3/12	£14.0bn.
Projected payroll at 31/3/15 (in 2012 terms)	£12.9bn.
Projected payroll at 31/3/19 (in 2012 terms)	£12.6bn.
Brief description of transition from pay at 2012 to 2015/2019 if not broadly linear	There is a large drop in the total pay bill (in 2012 terms) between 2012 and 2015 as CO have predicted a significant shrinking of membership over the period with a corresponding large paybill reduction. Over the 4 year period between 2015 and 2019 the membership is predicted to fall by around half the previous period.
Average age* of actives at 31/3/12	45.3
Average age* of new entrants 2012-2015	36.5
Average age* of new entrants 2015-2019	36.5
Grouping of active members (to run through valuation software)	Grouped by age, gender, service, section and salary band. Over 24,000 groups to cover 532,000 active members in 2012.
Rate up of data	Rate up in line with known exclusions (headcount basis) - across all member groups average 1.5% rating up applied. No additional uprating required to align to conts/pension in accounts.
Application of methodology	Accrual cost of any required period has been taken as the average of the cost for the membership at the start and end of the period (with appropriate selection of YoU (Year of Use) mortality in the runs used).
GMP	Savings calculated approximately based on GMP data above GMP payment age. Approximation intended to be unbiased.
Earnings cap	Not material for PCSPS.

* Weighted by pay

Public sector transfer club	Allowance for cost of Club transfers continuing broadly in line with recent levels, unless this proves to be immaterial on further investigation. (expected allowance to be confirmed on receipt of information on recent Club transfers).
Choice	Tapered members will have the option of remaining in the existing scheme for the taper period or opting to immediately move to the 2015 scheme. Assumed number of members who will opt to transfer immediately to the 2015 scheme by sex and salary band. Nuvos members – 0% Other sections: SB1 – M 65% F 45% SB2 – M 55% F 40% SB3 – M 40% F 40% SB4 – M 40% F 35% This assumption is not expected to have a material effect on the results.
Allowance for re-entry by current actives	Withdrawal rates are net of re-entry.
Allowance for re-entry by current deferreds	Allowance for cost of re-entry continuing broadly in line with recent levels, unless this proves to be immaterial on further investigation.
Cost of non-accruing benefits (eg lump sum on death in service and service enhancements)	Recognised only at the point liability emerges (eg on death in service or ill-health retirement).
Cost of double accrual	Applicable only for (small) closed group of Prison Officers. Recognised uniformly up to exit (or when service cap is reached if earlier).
Allowance for expenses	Allowance expected to be made to cover expected administration costs (in line with previous practice).
Allowance for final salary definition, in excess of salary in final year	None.
Allowance for pay freeze on promotional/progression salary increases	None.
Allowance for short-term spouse pension	None.
Modelling of early retirement	Explicit using reduction factors that might be expected to apply at retirement (no existing factors for 2015 scheme).
Modelling of late retirement	No late retirement assumed where actuarially neutral enhancement applies.
Modelling of members with non-integer SPA	Use nearest integer.
Treatment of deferred members above NPA	All members valued. Impact of those above NPA is ~ 1% of total liabilities.

Application of interest to notional assets	Discount rate assumed to apply uniformly over any particular year; all cashflows treated as applying mid-year.
Member contribution yields	Targeted yields for 2012-15; as implied by 2015 scheme design from 2015.
Allowance for children's pensions	Current children's pensions valued but no allowance for future pensions.

Appendix C: Record of changes since 16 January 2014

C.1 This advice was issued in draft on 16 January 2014. The table below records the changes made since that draft.

Reference	**Change**
Various	Minor wording changes throughout to improve clarity.
Tables 2.1 to 2.3	Numbers have changed very slightly to reflect the final groupings used in the valuation.
Paragraphs 3.1 to 3.8	Some additional wording to improve clarity. No change in methodology described.
Charts 1A to 3B	Updated to reflect some very minor changes in calculations since previous draft was issued.
3.17 and 3.18	Added since previous draft as methodology hadn't been decided when draft was issued.
Paragraph 4.6	Added comment on Nuvos members.
Table 4.2	Numbers updated so they are based on the final valuation results rather than approximations. Although the results have changed from negative to positive, there is no change to the conclusion based on the results (that the overall cost of benefits is not highly sensitive to the assumption used).
Chapter 5	Some rewording for clarity.
Paragraph 5.5	Added since previous draft was issued.
Paragraph 6.1 to 6.4	More detail added on how GMP savings have been estimated.
Paragraph 6.7 to 6.10	Confirmation of approach to PSTC and rejoiners.
Paragraph 6.12 to 6.17	Added since previous draft was issued.