Isle of Man Public Sector Pensions Authority

2016 Actuarial Valuation
Valuation Report

September 2017

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For and on behalf of Hymans Robertson LLP

Contents

Executive summary

We have carried out an actuarial valuation of the Isle of Man (IOM) Public Sector Pensions Authority (PSPA) pension schemes ('the Schemes') as at 31 March 2016. The results are presented in this report and are briefly summarised below.

Unless otherwise noted, figures shown in this report relate to the combined PSPA pension schemes (being the sum of each pension scheme noted on page 5).

Past service liabilities

The table below summarises the past service liabilities of the Schemes as at 31 March 2016 (and the last formal valuation as at 31 March 2013 for comparison purposes) in respect of benefits earned by members up to each valuation date.

	Total PSPA	
Past Service Liabilities	**31 March 2016 (£000)**	**31 March 2013 (£000)**
Employees	1,095,308	1,131,859
Deferred Pensioners	192,483	141,530
Pensioners	1,048,190	789,951
Total Liabilities	**2,335,981**	**2,063,340**

The total past service liabilities have increased over the period. The primary reasons for this increase are:

- Members accruing more benefits
- The unwinding of the discount rate (i.e. interest on the liabilities)
- The impact of changing underlying actuarial assumptions

Cost of accruing benefits

The Schemes are unfunded arrangements. Active members pay contributions based on their pensionable pay, with the balance of cost being met by employers (principally, the IOM Government). The table below shows the cost of accruing benefits (the "future service rate") as at 31 March 2016 (and 31 March 2013), split by the amount paid by employees and the share of cost met by employers.

	Total PSPA	
Valuation Date	**31 March 2016**	**31 March 2013**
Employer Future Service Rate	20.3%	22.4%
Employee Contribution Rate	7.5%	6.4%
Total Future Service Rate	**27.8%**	**28.8%**

The reduction in the total cost of accruing benefits is primarily due to the impact of reform on the Government Unified Scheme (GUS). The effect of GUS reform has been partially offset by changes to the actuarial assumptions. Although this reform did not come into force until 1 April 2017, its impact on the total future service rate has been included within the figures in this report (the phased increase in employee contribution rates between 2018 and 2020 is not allowed for in the split between employee and employer above).

These rates do not directly affect the actual contribution rates payable by employers.

1 Introduction

Purpose

We have carried out an actuarial valuation of the IOM PSPA pension schemes as at 31 March 2016.

- This valuation report complies with all of the relevant regulations and professional standards, as set out in **Appendix A**.
- The figures in this report are based on our understanding of the benefit structure of the Schemes as at 31 March 2016, details of which are provided in **Appendix B,** with one exception. The exception being that the future service rates quoted allow for the latest GUS benefit reforms which came into force on 1 April 2017.
- The results of the valuation are dependent on the quality of the data provided to us by the PSPA for the specific purpose of this valuation. This data is summarised in **Appendix C**.
- As part of the valuation, assumptions must be made which are discussed in **section 2** as well as in **Appendix D.**
- The valuation results are then covered in **section 3**.
- An analysis of the key risks facing the Schemes is set out in **section 4**.

PSPA Pension Schemes

A summary of the PSPA pension schemes included in the 2016 valuation is;

- IOM Government Unified Scheme 2011 (GUS)
- IOM Police Pensions Scheme
- IOM Teachers' Pension Scheme
- Superannuation Manual Workers No1 Scheme 1973
- IOM Judicial Pension Scheme
- Tynwald Members Pension Scheme

Component reports

This report is the culmination of various "component" reports and discussions, in particular:

- The assumptions report dated 13 February 2017.
- The initial results report dated 4 July 2017.
- The data report dated 29 August 2017.

2 Assumptions and Funding Method

Due to the long term nature of the Schemes, assumptions must be made about the factors affecting the Schemes' finances in the future. Broadly speaking, our assumptions fall into two categories – financial and demographic.

Demographic assumptions typically try to forecast **when** benefits will come into payment and what form these will take. For example, when members will retire (e.g. at their normal retirement age or earlier), how long they will then survive and whether a dependant's pension will be paid.

Financial assumptions typically try to anticipate the **size** of these benefits. For example, how large members' final salaries will be at retirement and how their pensions will increase over time. In addition, the financial assumptions also help us to estimate how much all these benefits will cost in today's money.

Our approach to the assumptions used for this valuation is for each individual assumption to represent the "best estimate" of future experience. This effectively means there is a 50% chance that future experience will be better or worse than the chosen assumption. This is the same approach as the last valuation at 31 March 2013.

Financial assumptions

A summary of the main financial assumptions adopted for the valuation of members' benefits is shown below (along with those adopted at the last valuation for comparison).

Valuation Date	31 March 2016	31 March 2013
Discount rate	4.5% p.a.	5.0% p.a.
General salary growth	4.0% p.a.	4.5% p.a.
Pension increases	2.0% p.a.	2.0% p.a.
Retail Price Index Inflation	3.0% p.a.	3.0% p.a.
Consumer Price Index Inflation	2.0% p.a.	2.0% p.a.

Discount rate

The sole purpose of the discount rate assumption is to express the expected future benefit payments in today's money.

In general, assessing the affordability of unfunded public service pensions has generally been measured by comparing projected future Gross Domestic Product (GDP) with pension benefit payments. This was the approach adopted for the 2013 valuation. However, after discussions with the IoM Government, we understand that GDP growth is not viewed as the most suitable measure for assessing the future cost and affordability of public service pensions. It is felt that a more appropriate measure is the IoM Government's future expected income growth.

The long term expected income growth of the IoM Government is 3.5% p.a. based on a flat population. However, the IoM Government's net inwards long term migration target means that long term income growth could be expected to increase by a further 1% p.a. due to population growth. Combining these two factors together gives an overall long term income growth figure of 4.5% p.a..

Based on the view that a measure of income growth (instead of GDP) is viewed as a more appropriate measure for setting the discount rate for the purpose of the valuation, the discount rate assumption for the 2016 valuation is **4.5% p.a..**

CPI inflation and pension increases

The CPI inflation assumption is used to project the size of benefits expected to be paid in the future. This is a key assumption, especially when projecting future cash flows, and should be a best estimate of long-term future inflation.

Benefit increases for the PSPA Schemes are set by reference to the change in the UK CPI index (instead of the IoM CPI index). At the 2013 valuation of the PSPA Schemes, the CPI assumption was set at 2% p.a., which was consistent with the UK Government's long-term expectation at that time[1]. This has not changed since the 2013 valuation.

Therefore the CPI assumption for the 2016 valuation is **2.0% p.a**..

RPI inflation and salary growth

In many areas of the Public Sector, annual pay growth in recent years has been lower than the rate of inflation, and this may be expected to continue in the short to medium term. The pay growth assumption should however reflect what is expected in the long term, and be consistent with the other assumptions adopted. At the 2013 valuation, a salary growth assumption of 1.5% above RPI applied.

Analysis on historic salary growth within the IoM public sector found that annual growth has been between 4.0% to 4.5% p.a..

The discount rate is set relative to the IoM Government's expected income growth. In the event of a high level of income growth, it can be expected that workers, who will ultimately generate this growth, will share in the benefits of this. Therefore a high salary growth assumption is consistent with a high income growth assumption and vice versa.

The 2016 valuation discount rate is 0.5% lower than that used at 2013 which reflects a lower growth outlook. Therefore, it would be appropriate to reduce the long term salary growth assumption by the same amount (0.5%) to be consistent with the change to the discount rate and to match historical experience.

Furthermore, the IoM Government has recently introduced 'new terms for new starters' which results in lower overall pay scales, and therefore lower expected future salary growth in respect of incremental increases and pensionable allowances compared to historical experience.

All the above leads to a salary growth assumption of **4.0% p.a..**

We also make a separate allowance for expected salary growth as a result of promotion, which is included under 'other demographic assumptions'.

In order to specify the assumed rate of RPI inflation, consistent with the discount rate methodology applied, we need to make an assumption on the 'gap' between RPI and CPI. At the 2013 valuation, the 'best estimate' of the long term 'gap' between RPI and CPI was 1.0% p.a., and this remains the current best estimate today.

This leads to an assumed long term RPI of **3.0% p.a..**

Demographic assumptions

Longevity

Of all the demographic factors, longevity is the one that presents the greatest uncertainty. As a subscriber to Club Vita, the PSPA benefit from a greater understanding of longevity risk and the specific risk relative to the Schemes.

About Club Vita

Club Vita aims to provide greater insight into the longevity characteristics in occupational pension schemes by bringing like-minded schemes together in a community where longevity experience data is pooled. By combining the data from individual schemes a clearer picture of the underlying patterns emerges.

[1] OBR Economic and fiscal outlook: March 2014

The combined data, known as **VitaBank™**, presented in this report comes from over 220 schemes currently participating in Club Vita, who in total had around 2.8m pensions in payment, spread across the UK and the Isle of Man.

As a member of Club Vita, the PSPA has access to a range of market leading analysis designed to aid the understanding and management of pensioner longevity. Club Vita's analysis considers the expected longevity of each individual member of the scheme, based on a series of factors including affluence and retirement type. Rather than consider these factors separately, we analyse the combined effect for each member. The PSPA are therefore able to use longevity assumptions which are tailored to the diverse mix of their scheme members. This provides greater precision in assessing liabilities.

Baseline Longevity

The baseline longevity is based on Club Vita tables. This is a scheme specific longevity table based on the specific characteristics of the PSPA schemes' membership.

Future improvement to longevity

Future trends in longevity are highly uncertain, but the custom and practice in recent years has been to assume that lifespans will continue to lengthen, although there has been considerable variation in how fast and how long this improvement is expected to last.

At the 2013 valuation, it was assumed that the strong improvements in life expectancy observed at that time would continue to strengthen for a few more years (referred to as 'non-peaked') before tailing off to a stable long term rate of improvement equivalent to a rate of increase of 1 year per decade for men and women.

Since the 2013 valuation, we have observed heavier mortality in the England and Wales population than that expected (i.e. more people dying than expected). We understand that the IoM also experienced heavier mortality over this period.

For the 2013 valuation, the short term rate of improvements assumption considered that the improvements being experienced by the generation born around the early and mid 1930s would continue (i.e. 'non-peaked'). However, longevity experience in the last few years suggests short term improvements are slowing down. Consequently, we have amended this assumption for the 2016 valuation and assume that the rate of future improvements in longevity will slow down in the immediate future (referred to as 'peaked') before reaching the same stable long term rate of improvement to that assumed at the 2013 valuation (1 year per decade for men and women).

We will continue to review the appropriateness of this assumption at future valuations.

The longevity assumptions give the following sample average future life expectancies for members at age 65 (compared to the assumptions made for the 2013 valuation):

	Active & Deferred		Current Pensioners	
	Male	Female	Male	Female
2013 valuation – baseline	20.7	23.4	20.7	22.8
2013 valuation – with improvements	26.7	28.8	24.1	26.0
2016 valuation – baseline	20.4	22.8	20.2	22.0
2016 valuation – with improvements	24.9	27.1	22.7	24.3

Note that the figures for actives and deferreds assume that they are aged 45 at the respective valuation dates.

Age retirements

The age retirement assumption is based on the earliest age at which members are able to retire from the scheme with no reduction to their benefits. For the non-GUS schemes, this is as defined in the rules. For the Unified

Scheme, members are able to retire at any age between 55 and 75, with their benefits based on a variable accrual rate (except section 7). The assumed retirement age for Unified Scheme members is as follows;

- Sections 1 to 6 and all existing deferred members – age 60
- Section 7 – age 55

Commutation

For the 31 March 2013 valuation, it was assumed that members elected to exchange pension for additional for additional tax-free cash up to 50% of the maximum amount permitted. Following consideration of recent experience, this percentage has been increased to 90% for the 31 March 2016 valuation.

Other demographic assumptions

Assumptions such as the rate at which members are assumed to leave Government employment with a deferred pension and the assumed incidence of ill-health early retirements affect the assessed cost of benefits accrued to date (“past service liabilities”) and the cost of benefits accrued in future (“future service rate”).

The 2016 assumption for all other demographic assumptions are identical to those adopted for the 2013 valuation.

Assets

The schemes are all unfunded arrangements with contributions used to meet the cost of benefits in payment and the balance of cost being met by IOM Government.

Funding method

It is important to realise that the actual cost of the Schemes (i.e. how much money they will ultimately have to pay out to the members in the form of benefits) is currently unknown. This cost will not be known with certainty until the last benefit is paid to the last pensioner. The core purpose of this valuation is to estimate what this cost will be and how it will develop in the future, so that the Schemes can then develop a strategy to meet it.

Such a valuation can only ever be an estimate – as the future cannot be predicted with certainty. However, as actuaries, we can use our understanding of the Schemes and the factors that affect it to determine an anticipated cost which is as sensible and realistic as possible.

For this valuation our calculations identify separately the expected cost of members’ benefits in respect of scheme membership completed before the valuation date (“past service”) and that which is expected to be completed after the valuation date (“future service”).

Past service

The principal measurement here is the value placed on the Schemes’ liabilities (calculated using the assumptions outlined above). Our calculation of the Schemes’ liabilities explicitly allows for expected future pay and pension increases.

Future service

In addition to benefits that have already been earned by members prior to the valuation date, employee members will continue to earn new benefits in the future. The cost of these new benefits is met by both employers and employees.

For the valuation results for each scheme, we have calculated the future service rate as the cost of benefits being earned by members over the year following the valuation, taking account of expected future salary increases until retirement. This funding method we have used is known as the Projected Unit Method.

The future service rate should reflect the expected cost of benefit accrual (as a percentage of pay) now and in the future, i.e. the future service rate should be relatively stable from one valuation to the next (subject to the actuarial assumptions being unchanged).

Where a pension scheme admits new entrants, such that the overall membership profile remains broadly unchanged over time, the use of the Projected Unit Method leads to a relatively stable future service rate.

3 Results

Past service

In assessing the value of the past service liabilities at the valuation date, we have used the actuarial assumptions and the funding method described in the previous section of this report. The tables below compare the value of the liabilities at 31 March 2016 with those as at 31 March 2013.

Total PSPA

	Total PSPA	
Valuation Date	**31 March 2016**	**31 March 2013**
Past Service Liabilities	***(£000)***	***(£000)***
Employees	1,095,308	1,131,859
Deferred Pensioners	192,483	141,530
Pensioners	1,048,190	789,951
Total Liabilities	**2,335,981**	**2,063,340**

Government Unified Scheme

	Section 1		Section 2		Section 3		Section 4	
Valuation Date	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**
Past Service Liabilities	***(£000)***	***(£000)***	***(£000)***	***(£000)***	***(£000)***	***(£000)***	***(£000)***	***(£000)***
Employees	144,705	102,615	590,205	685,065	82,584	67,798	8,315	5,924
Deferred Pensioners	130,172	107,605	26,462	0	5,181	13,068	1,122	823
Pensioners	468,614	487,627	212,852	31,155	15,942	2,295	674	27
Total Liabilities	**743,491**	**697,848**	**829,519**	**716,221**	**103,707**	**83,161**	**10,111**	**6,774**

	Section 5		Section 6		Section 7		Total GUS	
Valuation Date	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**
Past Service Liabilities	***(£000)***	***(£000)***	***(£000)***	***(£000)***	***(£000)***	***(£000)***	***(£000)***	***(£000)***
Employees	20,057	22,040	95	40	19,936	27,155	865,897	910,638
Deferred Pensioners	1,008	118	5	0	300	0	164,250	121,614
Pensioners	7,341	0	0	0	13,957	4,639	719,380	525,743
Total Liabilities	**28,406**	**22,158**	**100**	**40**	**34,193**	**31,794**	**1,749,527**	**1,557,995**

Police Pension Schemes

	1991 Scheme		2010 Scheme		Total Police	
Valuation Date	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**
Past Service Liabilities	***(£000)***	***(£000)***	***(£000)***	***(£000)***	***(£000)***	***(£000)***
Employees	48,040	55,623	1,265	272	49,305	55,895
Deferred Pensioners	5,845	2,132	57	170	5,902	2,302
Pensioners	112,293	83,028	0	0	112,293	83,028
Total Liabilities	**166,178**	**140,783**	**1,322**	**442**	**167,500**	**141,225**

Teachers' Pension Scheme

	Pre 2007 Scheme		Post 2007 Scheme		Total Teachers	
Valuation Date	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**
Past Service Liabilities	***(£000)***	***(£000)***	***(£000)***	***(£000)***	***(£000)***	***(£000)***
Employees	144,654	146,313	20,757	8,215	165,411	154,528
Deferred Pensioners	20,578	16,393	1,309	356	21,887	16,749
Pensioners	194,034	160,920	521	358	194,555	161,278
Total Liabilities	**359,266**	**323,626**	**22,587**	**8,929**	**381,853**	**332,555**

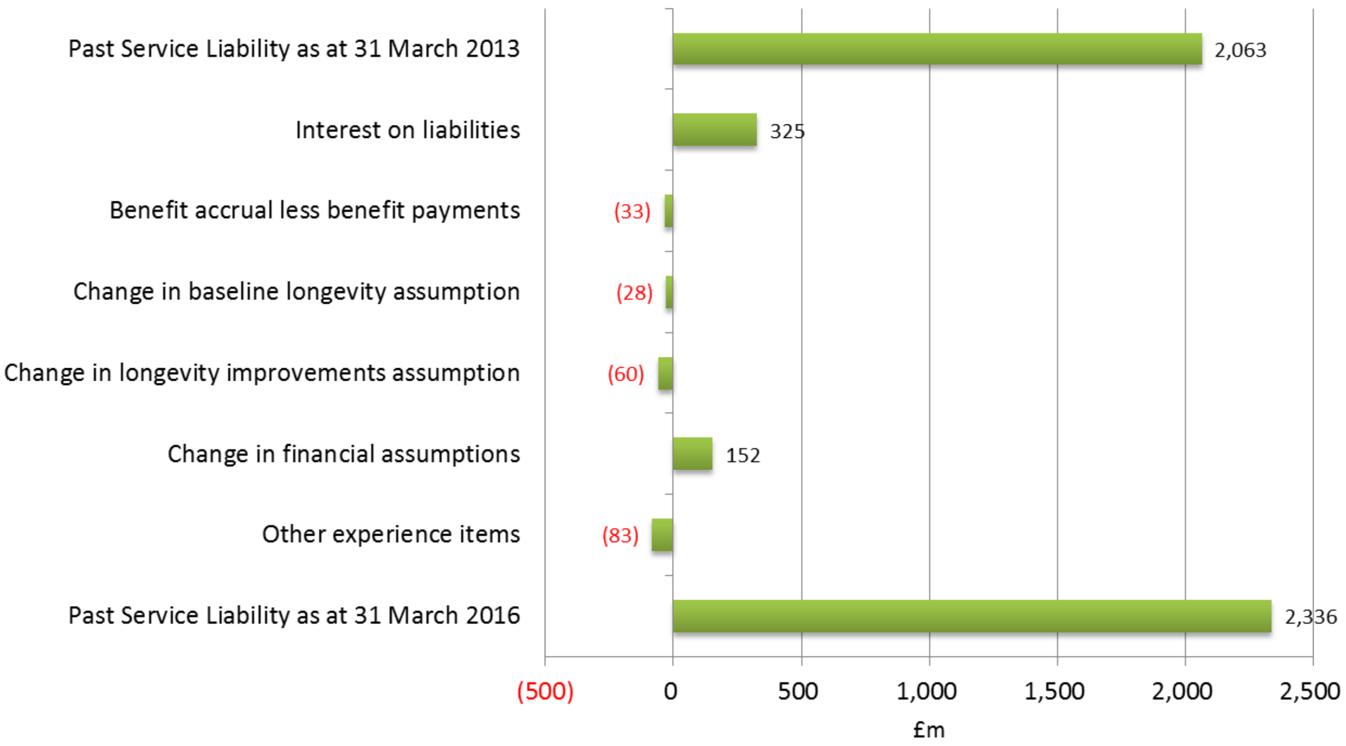
Non GUS Small Schemes

	Judical 1992		Judical 2004		Manual Workers (No.1) Scheme	
Valuation Date	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**
Past Service Liabilities	***(£000)***	***(£000)***	***(£000)***	***(£000)***	***(£000)***	***(£000)***
Employees	0	0	4,752	2,390	186	1,818
Deferred Pensioners	0	0	0	0	191	250
Pensioners	1,649	1,803	3,621	3,646	5,689	5,076
Total Liabilities	**1,649**	**1,803**	**8,373**	**6,036**	**6,066**	**7,144**

	Tynwald		Total Non GUS Small Schemes	
Valuation Date	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**
Past Service Liabilities	***(£000)***	***(£000)***	***(£000)***	***(£000)***
Employees	9,757	6,589	14,695	10,798
Deferred Pensioners	253	614	444	865
Pensioners	11,003	9,378	21,962	19,903
Total Liabilities	**21,013**	**16,582**	**37,101**	**31,565**

Summary of changes to the past service liabilities

The chart below illustrates the factors that caused the past service liabilities to change between 31 March 2013 and 31 March 2016 for the combined PSPA schemes:



Further comments on some of the items in this chart:

- There is an interest cost of £325m. This is broadly three years of interest at 5.0% p.a. applied to the past service liabilities at 31 March 2013 (£2,063m).
- The impact of benefit accrual (net of benefits paid) has led to a decrease to the liabilities of around £33m.
- The change in mortality assumptions (baseline and improvements) has given rise to a decrease to the liabilities of £88m. This is mainly due to the change in assumed future longevity improvements.
- The change in financial assumptions since the previous valuation has led to an increase to the liabilities of £152m. This is mainly due to the reduction in the discount rate.
- Other experience items, primarily changes in the membership data, have served to decrease the value of the past service liabilities at this valuation by around £83m. Salary increases and pension increases in the intervaluation period were less than expected leading to a reduction in the past service liabilities. There are also other factors, such as the number of early leavers, deaths and ill health retirements. These items of experience have not been analysed due to the relatively minor impact on the results.

Appendix E sets out the factors that have caused the past service liabilities to change between 31 March 2013 and 31 March 2016 for the GUS, the Police schemes and the Teachers' schemes.

Future service – cost of accruing benefits

We have calculated the average contribution rate that employers would need to pay to meet the estimated cost of members' benefits earned after 31 March 2016 (the 'future service contribution rate'). We have used the assumptions set out in the previous section of this report and the method set out in **Appendix D**.

The tables below show the future service contribution rates for the 31 March 2016 valuation together with the 31 March 2013 valuation rates for comparison.

Total PSPA

	Total PSPA	
Valuation Date	**31 March 2016**	**31 March 2013**
Employer Future Service Rate	20.3%	22.4%
Employee Contribution Rate	7.5%	6.4%
Total Future Service Rate	**27.8%**	**28.8%**

Government Unified Scheme

	Section 1		Section 2		Section 3		Section 4	
Valuation Date	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**
Employer Future Service Rate	18.5%	19.2%	20.85%	23.2%	23.1%	26.8%	18.9%	19.3%
Employee Contribution Rate	5.0%	4.8%	7.75%	6.2%	8.5%	5.5%	6.6%	6.6%
Total Future Service Rate	**23.5%**	**24.0%**	**28.6%**	**29.4%**	**31.6%**	**32.3%**	**25.5%**	**25.9%**

	Section 5		Section 6		Section 7		Total GUS	
Valuation Date	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**
Employer Future Service Rate	19.8%	19.8%	18.6%	18.2%	35.2%	36.2%	20.3%	22.5%
Employee Contribution Rate	9.5%	9.5%	8.4%	8.4%	11.0%	11.0%	6.8%	6.1%
Total Future Service Rate	**29.3%**	**29.3%**	**27.0%**	**26.6%**	**46.2%**	**47.2%**	**27.1%**	**28.6%**

Police Pension Schemes

	1991 Scheme		2010 Scheme		Total Police	
Valuation Date	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**
Employer Future Service Rate	37.2%	30.9%	19.3%	19.1%	33.7%	30.3%
Employee Contribution Rate	14.3%	13.5%	11.6%	10.7%	13.8%	13.3%
Total Future Service Rate	**51.5%**	**44.4%**	**30.9%**	**29.8%**	**47.5%**	**43.6%**

Teachers' Pension Schemes

	Pre 2007 Scheme		Post 2007 Scheme		Total Teachers	
Valuation Date	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**
Employer Future Service Rate	17.6%	17.1%	16.4%	17.1%	17.1%	17.1%
Employee Contribution Rate	10.3%	9.2%	9.3%	8.1%	10.0%	9.0%
Total Future Service Rate	**27.9%**	**26.3%**	**25.7%**	**25.2%**	**27.1%**	**26.1%**

Non GUS Small Schemes

	Judicial 2004		Manual Workers (No.1) Scheme		Tynwald	
Valuation Date	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**
Employer Future Service Rate	42.4%	39.5%	24.5%	23.5%	44.9%	42.1%
Employee Contribution Rate	3.0%	3.0%	1.5%	1.5%	5.0%	4.0%
Total Future Service Rate	**45.4%**	**42.5%**	**26.0%**	**25.0%**	**49.9%**	**46.1%**

Note that the GUS employee contribution rates are in respect of the 2016/17 year only and do not allow for the employee contribution rate increases being phased in from 1 April 2018.

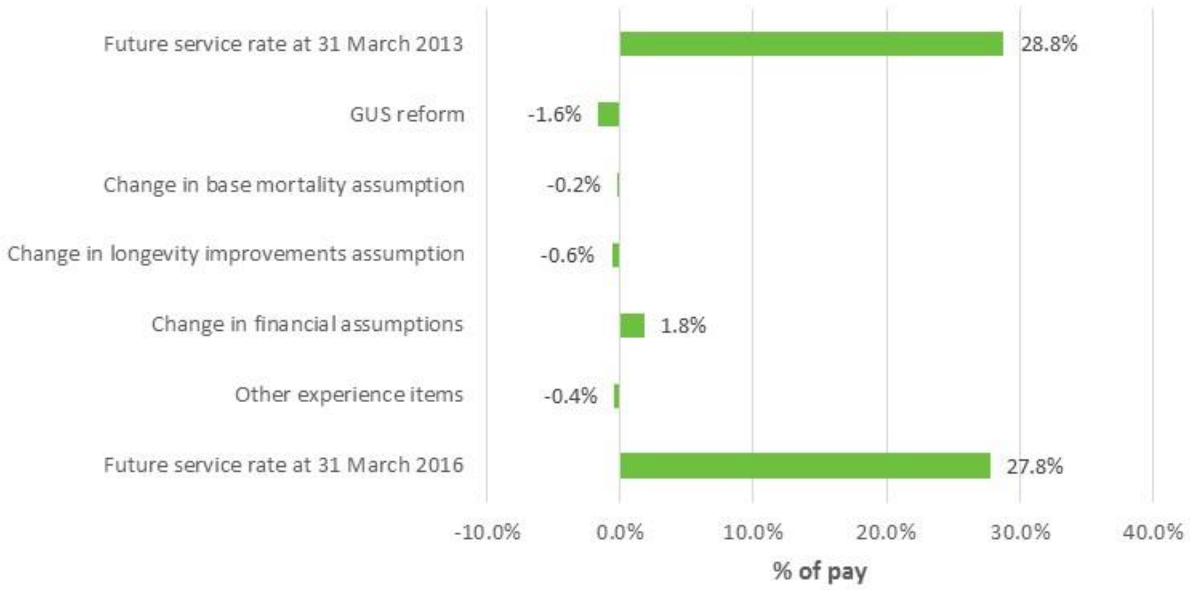
As previously noted, the change in benefits accrued from 1 April 2017 being made as a result of GUS reform has been taken into account in determining the total future service rates shown above.

The average employee contribution rates for the non-GUS schemes are for the 2016/17 year only.

The above contribution rates do not include any allowance for expenses. We have assumed that these are paid by the IOM Treasury as and when they arise.

Summary of changes to the employer future service rate

The chart below illustrates the factors that caused the employer future service rate to decrease between 31 March 2013 and 31 March 2016:



As can be seen from this chart, the factors that have had the biggest impact on the future service rate between 2013 and 2016 are broadly similar to those discussed for the past service position.

One additional factor has been the reform of GUS. This reform has resulted in a 6% reduction to member benefits accrued from 1 April 2017. Although the reform did not come into force until 1 April 2017, its impact has been allowed for within the future service rates contained in this report. It has led to a 1.6% of pay reduction in the total future service rate as at 31 March 2016 at a total PSPA level, as shown in the chart above.

Appendix E sets out the factors that have caused the future service rates to change between 31 March 2013 and 31 March 2016 for the GUS, the Police and the Teachers' schemes separately.

4 Risk Assessment

The valuation results depend critically on the actuarial assumptions that are made about the future of the Schemes. If all of the assumptions made at this valuation were exactly borne out in practice then the results presented in this document would represent the true cost of the Schemes as at 31 March 2016.

However, no one can predict the future with certainty and it is unlikely that future experience will exactly match all of our assumptions. The future therefore presents a variety of risks to the Schemes and these should be considered as part of the valuation process. In particular:

- The main risks to the financial health of the Schemes should be **identified**.
- Where possible, the financial significance of these risks should be **quantified**.
- Consideration should be given as to how these risks can then be **controlled** or **mitigated**.
- These risks should then be **monitored** to assess whether any mitigation is actually working.

This section investigates the potential implications of the actuarial assumptions not being borne out in practice. Set out below is a brief assessment of the main risks and their effect on the valuation results, beginning with a look at the effect of changing the main assumptions and then focusing on longevity risk.

Sensitivity of valuation results to changes in assumptions

The table below gives an indication of the sensitivity of the valuation results to small changes in some of the main assumptions used.

		Impact	
Assumption	**Change**	**Liabilities (£m)**	**Future service rate (% of pay)**
Discount rate	Decreases by 0.5%	Decrease by £180m	Decrease by 3.1%
Price inflation*	Increases by 0.5%	Increase by £200m	Increase by 3.6%

*affecting salary growth, CARE revaluation, deferred revaluation and pension increases.

This is not an exhaustive list of the assumptions used in the valuation. For example, changes to the assumed level of withdrawals and ill health retirements will also have an effect on the valuation results. However, the table contains those assumptions that typically are of most interest and have the biggest impact.

Please note that the table shows the effect of changes to each assumption in isolation. In reality, it is perfectly possible for the experience of the Schemes to deviate from more than one of our assumptions simultaneously and so the precise effect on the past service liabilities is therefore more complex.

Longevity risk

The valuation results are also very sensitive to unexpected changes in future longevity. All else being equal, if longevity improves in the future at a faster pace than allowed for in the valuation assumptions, the past service liabilities will increase and the cost of benefits accruing will increase.

Recent medical advances, changes in lifestyle and a greater awareness of health-related matters have resulted in life expectancy amongst pension scheme members improving in recent years at a faster pace than was originally foreseen. It is unknown whether and to what extent such improvements will continue in the future.

For the purposes of this valuation, we have selected assumptions that we believe make an appropriate allowance for future improvements in longevity, based on the actual experience of the Schemes since the previous valuation.

The table below shows how the valuation results at 31 March 2016 would be affected by adopting different longevity assumptions.

Longevity assumptions	Liabilities (£m)	Total Future Service Rate (% of pay)
2016 valuation (with 'peaked' improvements)	2,336	27.8%
2016 valuation (with 'non-peaked' improvements)	2,396	28.4%

Full details of the longevity improvements adopted at this valuation are set out on in **Appendix D**.

The 'non-peaked' figures assume the rate of future improvements continues to increase and is a more prudent outlook.

Again, the range of assumptions shown here is by no means exhaustive and should not be considered as the limits of how extreme future longevity experience could be.

Other risks to consider

The table below summarises the effect that changes in some of the other valuation assumptions and risk factors would have on the funding position. Note that these are probably unlikely to have a large financial impact on the Schemes and therefore the analysis is qualitative rather than quantitative.

	Impact	
Factor	Liabilities	Future service rate
Greater level of ill health retirement	Increase	Marginal
Reduced level of withdrawals	Increase	Marginal
Rise in average age of employee members	Marginal	Increases

One further risk to consider is the possibility of future changes to Regulations that could materially affect the benefits that members become entitled to. It is difficult to predict the nature of any such changes but it is not inconceivable that they could affect not just the cost of benefits earned after the change but could also have a retrospective effect on the past service position (as the move from RPI to CPI-based pension increases already has).

Managing the risks

Whilst there are certain things, such as the life expectancy of members, that are not directly within the control of the PSPA, that does not mean that nothing can be done to understand the risks further and to mitigate their effect. Although these risks are difficult (or impossible) to eliminate, steps can be taken to manage them.

Ways in which some of these risks can be managed could be:

- Implementation of a cost sharing mechanism. Separate advice has been provided to the PSPA in relation to the design of a suitable cost sharing mechanism for the PSPA schemes.
- Taking steps internally to monitor the decisions taken by members and employers (e.g. relating to early / ill health retirements or salary increases) in a bid to curtail any adverse impact on the Schemes. An annual review of actual pay increases against those assumed could be undertaken.
- Insuring against specific risks, where such insurance is available (e.g. ill health liability insurance).

- Setting employer specific contribution rates based on the benefits accrued in each section of the scheme by members employed by each employer.
- Recognising the effect of transfer values on cashflows and the cost of the Schemes.
- Review of the option factors currently in place.
- Regularly reviewing the Fund’s membership data to ensure it is complete, up to date and accurate.

Adopting one or more of these measures can assist with the management of risk within the PSPA schemes.

5 Post valuation events

Transfer of the Tynwald Scheme into GUS

The Tynwald scheme membership was transferred into GUS with effect from 23 September 2016.

Two new sections of GUS were created to accommodate this transfer. Section 8a of GUS was created for existing Tynwald members at 23 September 2016 who chose to protect the value of their benefits in their former scheme. Section 8 was created for new members from 23 September 2016 and those who did not choose to join section 8a.

At the 2019 valuation, the results for GUS will include the Tynwald members.

GUS reform

As noted previously, benefits accrued in GUS from 1 April 2017 have been amended to reduce the total cost of future benefits. A 6% reduction in benefits has been implemented for both current members and new joiners for all service accrued from 1 April 2017.

The impact on the total future service rate is detailed in Appendix E.

A further element of the reform is an increase in employee pension contributions of 2.5% of pensionable pay across all members, both existing and new joiners, in all sections. This increase will be phased in between 2018 and 2020.

The future service rate results in Section 3 do not allow for this change when splitting the total cost between employee and employer. For information, we have shown below the employer/employee split after allowing for the full increase in employee contributions.

	Section 1		Section 2		Section 3		Section 4	
Valuation Date	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**
Employer Future Service Rate	16.0%	19.2%	18.35%	23.2%	19.35%	26.8%	16.4%	19.3%
Employee Contribution Rate	7.5%	4.8%	10.25%	6.2%	12.25%	5.5%	9.1%	6.6%
Total Future Service Rate	**23.5%**	**24.0%**	**28.6%**	**29.4%**	**31.6%**	**32.3%**	**25.5%**	**25.9%**

	Section 5		Section 6		Section 7		Total GUS	
Valuation Date	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**	**31 March 2016**	**31 March 2013**
Employer Future Service Rate	17.3%	19.8%	16.1%	18.2%	32.7%	36.2%	17.7%	22.5%
Employee Contribution Rate	12.0%	9.5%	10.9%	8.4%	13.5%	11.0%	9.4%	6.1%
Total Future Service Rate	**29.3%**	**29.3%**	**27.0%**	**26.6%**	**46.2%**	**47.2%**	**27.1%**	**28.6%**

The reform has no impact on the past service liabilities (as accrued rights are not affected).

Non-GUS reform

We understand that conversations are ongoing with the other non-GUS schemes regarding possible future benefit reform. At this stage, no firm agreement has been reached and therefore the results in this report do not make any allowance for any reform in the non-GUS schemes.

6 Reliances and limitations

Scope

This document has been requested by and is provided to the IOM PSPA. It has been prepared by Hymans Robertson LLP for triennial valuation purposes. In particular, it fulfils the statutory obligation to carry out triennial actuarial valuations of the IOM Government Unified Scheme in accordance with rule 84.3 of the Isle of Man Government Unified Scheme 2011 Regulations. None of the figures should be used for accounting purposes (e.g. under FRS17 or IAS19) or for any other purpose.

Hymans Robertson LLP accepts no liability to any other party unless we have expressly accepted such liability.

The results of the valuation are dependent on the quality of the data provided to us by the Administering Authority for the specific purpose of this valuation. We have previously issued a separate report confirming that the data provided is fit for the purposes of this valuation and have commented on the quality of the data provided. The data used in our calculations is as per our report of 29 August 2017. If any material issues with the data provided are identified at a later date, then the results in this report may change.

Peter Summers

Fellow of the Institute and Faculty of Actuaries

18 September 2017

Robert Bilton

Fellow of the Institute and Faculty of Actuaries

Appendix A: Regulations and Professional Standards

PSPA schemes regulations

The projection of benefits from each PSPA pension arrangement has been carried out based on our understanding of the benefits payable under each scheme. The following regulations govern the benefit entitlement of the main PSPA schemes;

- Rules of the Isle of Man Government Unified Scheme 2011
- Police Pensions Regulations 1991
- Police Pensions Regulations 2010
- Public Sector Pensions Act 2011
- The Teachers Superannuation Order 2007 (formerly the Superannuation Act 1984)

Technical Actuarial Standards

Technical Actuarial Standards (TASs) are issued by the Financial Reporting Council and they set the standard for certain items of actuarial work in the UK, in terms of the type of information provided and the way it is communicated. As actuaries, we must comply with these standards when presenting the results of triennial valuations. We have applied the TAS standards to this work.

This report complies with the relevant Technical Actuarial Standards set out below:

- TAS 100; and
- TAS 300

Appendix B: Summary of the Schemes' benefits

Provided below is a brief summary of the non-discretionary benefits that we have taken into account for active members at this valuation. This should not be taken as a comprehensive statement of the exact benefits to be paid. For further details please see the Regulations.

Government Unified Scheme

The information below does not include any allowance for the changes to GUS from 1 April 2017 (see Section 5 for further details).

Provision	Benefit Structure From 1 April 2012
Entry conditions	Section 1 and 7 is open to new members (aged 16 to 65). Sections 2 to 6 are closed to new entrants.
Normal retirement age (NRA)	Flexible between ages 55 and 75
Member contributions	Section 1: 5% Sections 2 to 7: 6.6% to 11% depending on the relevant section of membership
Transitional protections	Increases to contribution rates following implementation of GUS on 1 April 2012 are applied in 1% p.a. steps. Members within seven years of the previous scheme's Normal Pension Age as at 1 April 2012 will be able to join the Protected section without paying more than the Standard section contribution rate of 5% or your current rate of contribution if higher.
Pensionable pay	The amount of a Member's basic pay or fees due to the Member plus anything else if determined by the Commission or Employer and notified to the PSPA.
Final Pensionable Pay (FPP)	Final Salary sections: Average of best 3 consecutive years' pensionable pay in last 13 years, after each year has been revalued in line with inflation. CARE sections: Calculated as the Member's total pensionable pay for each year of pensionable service (with pay revalued) divided by the number of years of pensionable service in the relevant period of active membership.
Qualifying service	Qualifying service means any period: 1) of service where the member is in receipt of pensionable pay; 2) of service Unpaid Family Leave where the members contributions have been paid; 3) of linked service from two records; and 4) of service from transfers in.
Normal retirement benefits at NRA	Annual Retirement Pension – Accrual rate * FPP * Qualifying service. Accrual rate is determined by retirement age and section. Pension Commencement Lump Sum – By commutation of pension only; up to 30% of pension value.
Pension cap	75% of FPP for sections 1 to 6, 66.9% of FPP for section 7.
Ill-health benefits from active membership	Two tiers of ill health benefits apply: Lower - an immediate pension is paid if member is permanently incapable of doing current or comparable job. Pension = Qualifying Service * 1.5% * FPP. Upper - an enhanced pension is paid if permanently unable to work at all. Pension = Prospective service to 65 * 1.5% * FPP.
Ill-health benefits from deferment	Only applicable if permanently unable to work in any position. Pension = Accrued service * 1.5% * Final pay (increased in line with inflation to date of retirement)

Provision	Benefit Structure From 1 April 2012
Early retirement benefits (non ill-health)	Can retire from age 55 using the relevant accrual rate for the given section and age.
Death after retirement	Short term pension for 3 months equal to member's pension on date of death. Long term pension of 0.625% * FPP for each year of service (i.e. 1/160ths) increased in line with inflation to the date of death. Long term pension starts after 3 month short term is finished. For section 7 members, the rate is 1.11% rather than 0.625%.
Death in deferment	Long term pension of 0.625% * Deferred members FPP (increased in line with inflation from leaving active service to date of death) for each year of service. For section 7 members, the rate is 1.11% rather than 0.625%.
Death in service	Lump sum of 3 times pensionable pay at date of death. Short term pension for 3 months equal to pensionable pay on date of death. Long term pension of 0.625% * FPP * prospective years of service to 65. Long term pension starts after 3 month short term is finished, but is only payable if the member had more than 2 years' service. For section 7 members, the long term pension is calculated as 1.11% * FPP * prospective service to age 55 subject to a minimum of 30 years.
Leaving service options	Less than 3 months service: Refund of contributions. Service between 3 months and 2 years: Refund of contributions or a transfer value. More than 2 years' service: A deferred pension calculated as Accrual rate x FPP x Qualifying service where accrual rate is determined at actual retirement age.
State pension scheme	The scheme is contracted out.

Police Pension Regulations Scheme

Provision	Benefit Structure To 31 March 2010	Benefit Structure From 1 April 2010
Entry conditions	Closed to new members from 1 April 2010.	Open to new members.
Normal Retirement Age	Between ages 50-60 depending on length of service in the pension scheme and rank.	Between ages 55-65 depending on length of service in the pension scheme and rank.
Member contributions (payable from 1 April 2014)	Salary less than £60,000: 14.25% Salary greater than £60,000: 15.05% Rates apply if eligible for ill-health benefits.	Salary less than £27,000: 11.00% Salary between £27,000 & £60,000: 12.05% Salary greater than £60,000: 12.75% Rates apply if eligible for ill-health benefits.
Pensionable pay	Basic salary plus any additional salary on temporary promotion (not including overtime and other allowances).	
Final pay	Highest pensionable pay of the previous three years. Increases in line with inflation are applied to all historic salaries.	The greatest of: 1) Pensionable pay in the last twelve months prior to retirement; 2) Pensionable pay in either of the two preceding years; and 3) Pensionable pay averaged over any three consecutive years in the preceding seven. Increases in line with inflation are applied to all historic salaries.
Period of scheme membership	Total years and days of service during which a member contributes to the scheme.	
Normal retirement benefits at NRA	1/60th of final pay for each year of scheme membership for service up to 20 years. For each year of service worked over 20 years the member accrues 2/60ths of final pay.	1/70th of final pay for each year of scheme membership.
Pension cap	Maximum of 40/60ths final pay (30 years of service).	Maximum of 35/70ths final pay (35 years of service).
Retirement lump sum benefit	By commutation only	Lump Sum Retirement Grant - 4/70ths of final pay for each year of scheme membership
Option to increase annual pension	None	Option to exchange some of their lump sum into annual pension.
Ill-health benefits from active membership	In the event of premature retirement due to permanent ill-health or incapacity, an immediate pension is paid based on actual scheme membership plus an enhancement period of scheme membership. The enhancement period is dependent on scheme membership at date of leaving. No reduction is applied due to early payment.	There are two tiers of ill-health retirement. Tier 1: Accrued benefits are paid with no reduction. Tier 2: Accrued benefits plus an enhancement are paid with no reduction. The enhancement period is dependent on scheme membership at date of leaving.
Ill-health benefits from deferment	None	Members can receive their unreduced deferred pension if they meet the Tier 2 ill-health benefit requirements.

Provision	Benefit Structure To 31 March 2010	Benefit Structure From 1 April 2010
Early retirement (non ill-health)	The option to retire early on non ill-health grounds is not available.	Can retire from age 55. Benefits are subject to reduction on account of early payment.
Pension increases	Pensions are increased under IOM statute.	
Death after retirement	A spouse's or civil partner's short term pension equal to the member's pension will be paid for the first 13 weeks after death if the member had more than 3 years pensionable service; then A long term pension of one half of the member's pension is payable.	A spouse's or civil partner's pension of one half of the member's pension is payable
Guarantee on death after retirement	5 years	5 years
Death in deferment	A spouse's or civil partner's pension of one half of the member's pension is payable.	A spouse's or civil partner's pension of one half of the member's pension is payable.
Death in service	A lump sum of two times final pay; plus A spouse's or civil partner's short term pension equal to the member's salary will be paid for the first 13 weeks after death if the member had more than 3 years pensionable service; then A long term pension of one half of the member's pension.	A lump sum of three times final pay; plus A spouse's or civil partner's pension of one half of the member's ill-health pension.
Children's pension	May be payable in addition	
Leaving service options	Less than 3 months service: Refund of contributions. Service between 3 months and 2 years: Refund of contributions or a transfer value. More than 2 years' service: A deferred pension calculated as Accrual rate x Final pay x Qualifying service where accrual rate is determined at actual retirement age.	
State pension scheme	The scheme is contracted out.	

Teachers' Pension Scheme

Provision	Benefit Structure To 31 December 2006	Benefit Structure From 1 January 2007
Entry conditions	Closed to new members from 1 January 2007.	Open to all new members.
Normal retirement age (NRA)	Age 60	Age 65
Member contributions	Tiered contributions were introduced from April 2012 and revised in 2013 and 2014 to achieve an increase from an average rate of 6.4% in 2011/12 to 9.6% in 2014/15. The structure of employee contribution rates from 1 April 2014 is set out below; Tier 1: up to £14,999 6.4% Tier 2: £15,000 to £25,999 7.2% Tier 3: £26,000 to £31,999 8.3% Tier 4: £32,000 to £39,999 9.5% Tier 5: £40,000 to £44,999 9.9% Tier 6: £45,000 to £74,999 11.0% Tier 7: £75,000 to £99,999 11.6% Tier 8: over £100,000 12.4%	
Pensionable pay	Basic salary plus any bonuses, fees, sick leave pay, maternity pay.	
Final pay	The greatest of: 1) Pensionable pay in the last twelve months prior to retirement; and 2) Average of best consecutive 3 years pensionable pay in the last 10 years; Increases in line with inflation are applied to all historic salaries.	
Period of scheme membership	Total years and days of service during which a member contributes to the scheme.	
Normal retirement benefits at NRA	1/80th of final pay for each year of scheme membership.	1/60th of final pay for each year of scheme membership.
Pension cap	Maximum of 45/80ths final pay (45 years of service).	Maximum of 45/60ths final pay (45 years of service).
Retirement lump sum benefit	3/80th of final pay for each year of scheme membership. Additional lump sum can be provided by commutation of pension	By commutation only
Ill-health benefits from active membership	In the event of premature retirement due to permanent ill-health or incapacity, an immediate pension and lump sum are paid to the member. There are two tiers of ill-health retirement. Partial Incapacity Benefit (PIB): Accrued benefits are paid with no reduction. Total Incapacity Benefit (TIB): Accrued benefits plus an enhancement are paid with no reduction. The enhancement service is at most 50% of prospective service to NRA.	
Ill-health benefits from deferment	Members can receive their unreduced deferred pension if they meet the TIB requirements.	
Early retirement (non ill-health)	Benefits paid on redundancy grounds after age 50 are paid with no actuarial reduction. Can take early retirement from age 55 with employer's consent. Benefits are subject to reduction on account of early payment.	
Pension increases	Pensions are increased under IOM statute.	

Provision	Benefit Structure To 31 December 2006	Benefit Structure From 1 January 2007
Death after retirement	A spouse's or civil partner's short term pension equal to the member's pension will be paid for the first 3 months after death; then A long term pension of 1/160th of the member's final pay for each year of scheme membership; plus If the member dies within five years of retiring the balance of five years' pension payments will be paid in the form of a lump sum.	
Death in deferment	A spouse's or civil partner's long term pension of 1/160th of the member's final pay for each year of scheme membership.	
Death in service	A lump sum of three times final pensionable pay; plus A spouse's or civil partner's short term pension equal to the member's salary will be paid for the first 3 months after death; then A long term pension of 1/160th of the member's final pay for each year of scheme membership.	
Children's pension	May be payable in addition	
Leaving service options	Less than 3 months service: Refund of contributions. Service between 3 months and 2 years: Refund of contributions or a transfer value. More than 2 years' service: A deferred pension calculated as Accrual rate x Final pay x Qualifying service where accrual rate is determined at actual retirement age.	
State pension scheme	The scheme is contracted out.	

Appendix C: Data

This section contains a summary of the membership and accounting data provided by the PSPA for the purposes of this valuation (the corresponding membership from the 2013 valuation is also shown for reference). For further details of the data, and the checks and amendments performed in the course of this valuation, please refer to our separate report dated 29 August 2017.

Membership data – whole fund

Employee members

	Membership numbers		FTE salary (£000)		Actual salary (£000)		Average Age (unweighted)		Average Service (unweighted)	
	2016	2013	2016	2013	2016	2013	2016	2013	2016	2013
GUS	7,970	7,716	237,005	239,358	208,040	196,298	45	46	9.6	11.9
Police	200	233	7,224	8,485	7,206	8,366	39	39	14.7	14.7
Teachers	1,183	1,186	42,485	43,904	39,298	39,756	43	44	12.1	13.1
Tynwald	32	33	1,351	1,325	1,351	1,325	57	56	14.2	13.5
Judicial	9	8	1,381	1,157	1,381	1,157	58	55	7.6	4.6
Manual Workers (No.1)	1	7	*	187	*	187	*	62	*	39.7
Total	**9,395**	**9,172**	*	**293,022**	*	**247,089**	**45**	**46**	**10.1**	**12.1**

* removed for data protection reasons

Deferred pensioners

	Membership numbers		Deferred pension at valuation date (£000)		Average Age (unweighted)	
	2016	2013	2016	2013	2016	2013
GUS	2,840	2,568	7,450	6,606	47	47
Police	55	35	344	188	43	45
Teachers	363	379	1,380	1,177	47	45
Tynwald	1	3	*	36	*	55
Judicial	-	-	-	-	-	-
Manual Workers (No.1)	8	11	11	19	62	60
Total	**3,267**	**2,996**	*	**8,026**	**47**	**47**

* removed for data protection reasons

Current pensioners (including spouses and children)

	Membership numbers		Pension (£000)		Average Age (unweighted)	
	2016	2013	2016	2013	2016	2013
GUS	5,216	4,128	41,222	31,325	69	69
Police	258	217	5,463	4,243	62	63
Teachers	1,018	864	12,327	10,130	70	70
Tynwald	46	50	823	752	76	76
Judicial	8	8	420	398	77	74
Manual Workers (No.1)	67	57	362	305	74	72
Total	**6,613**	**5,324**	**60,617**	**47,153**	**69**	**69**

Note that the membership numbers in the table above refer to the number of records provided to us and so will include an element of double-counting in respect of any members who are in receipt (or potentially in receipt of) more than one benefit.

Appendix D: Assumptions

Financial Assumptions

Financial assumptions	31 March 2016	31 March 2013
Discount rate	4.5% p.a.	5.0% p.a.
General salary growth	4.0% p.a.	4.5% p.a.
Pension increases	2.0% p.a.	2.0% p.a.
RPI Inflation	3.0% p.a.	3.0% p.a.
CPI Inflation	2.0% p.a.	2.0% p.a.

Mortality assumptions

Parameter	Value
Longevity – baseline	Vita curves
Longevity – improvements	
CMI Model version used	CMI 2013
Starting rates	CMI calibration based on data from Club Vita using the latest available data as at January 2014
Long term rate of improvement	Period effects: 1.25% p.a. for men and for women Cohort effects: 0% p.a. for men and for women
Period of convergence	Period effects: CMI model core values i.e. 10 years for ages 50 and below and 5 years for those aged 95 and above, with linear transition to 20 years for those aged between 60 and 80. Cohort effects: CMI core i.e. 40 years for those born in 1950 or later declining linearly to 5 years for those born in 1915 or earlier.
Proportion of convergence remaining mid-point	50%

As a member of Club Vita, the baseline longevity assumptions that have been adopted at this valuation are a bespoke set of VitaCurves that are specifically tailored to fit the membership profile of the Schemes. These curves are based on the data provided for the purposes of this valuation. Full details of these are available on request.

We have used a longevity improvement assumption based on the industry standard projection model calibrated with information from our longevity experts in Club Vita. The starting point for the improvements has been based on observed death rates in the Club Vita data bank over the period up to 2012.

We have used the 2013 version of the Continuous Mortality Investigation (CMI) longevity improvements model, instead of the more recent 2015 version, as we do not believe the increased mortality experience factored into the 2015 model is the start of a new trend. We believe it is more appropriate to use the 2013 version of the model for the 2016 valuation.

In the short term we have assumed that the improvements in life expectancy observed up to 2010 will start to tail off immediately, resulting in life expectancy increasing less rapidly than has been seen over the last decade or two. This could be described as assuming that improvements have 'peaked'.

In the longer term we have assumed that increases in life expectancy will stabilise at a rate of increase of 0.9 years per decade for men and women. This is equivalent to assuming that longer term mortality rates will fall at a rate of 1.25% p.a. for men and women.

However, we have assumed that above age 90 improvements in mortality are hard to achieve, and so the long term rate of improvement declines between ages 90 and 120 so that no improvements are seen at ages 120 and over. The initial rate of mortality is assumed to decline steadily above age 98.

Other demographic valuation assumptions

Age retirements	The age retirement assumption is based on the earliest age at which members are able to retire from the scheme with no reduction to their benefits. For the non-GUS schemes, this is as defined in the rules. The assumed retirement age for Unified Scheme members is as follows; • Sections 1 to 6 and all existing deferred members – age 60 • Section 7 – age 55
Retirements in ill health	Allowance has been made for ill-health retirements before Normal Pension Age (see table below).
Withdrawals	Allowance has been made for withdrawals from service (see table below).
Family details	A varying proportion of members are assumed to be married (or have an adult dependant) at retirement or on earlier death. For example, at age 60 this is assumed to be 80% for males and 75% for females. Husbands are assumed to be 3 years older than wives.
Commutation	Future pensioners are assumed to elect to exchange pension for additional tax-free cash up to 90% of the maximum amount permitted.

The tables below show details of the assumptions actually used for specimen ages. The promotional pay scale is an annual average for all employees at each age. It is in addition to the allowance for general pay inflation described above. For membership movements, the percentages represent the probability that an individual at each age leaves service within the following twelve months.

Male

Age	Incidence for 1000 active members per annum				
	Salary Scale	Death Before Retirement	Withdrawals	Ill Health Tier 1	Ill Health Tier 2
20	100	0.30	122.40	0.00	0.00
25	100	0.30	80.85	0.00	0.00
30	123	0.36	57.35	0.45	0.24
35	138	0.42	44.80	0.60	0.32
40	148	0.72	36.05	1.05	0.56
45	158	1.20	29.50	2.40	1.28
50	168	1.92	22.85	6.60	3.52
55	168	3.00	19.80	13.50	7.20
60	168	5.40	12.00	27.00	14.40

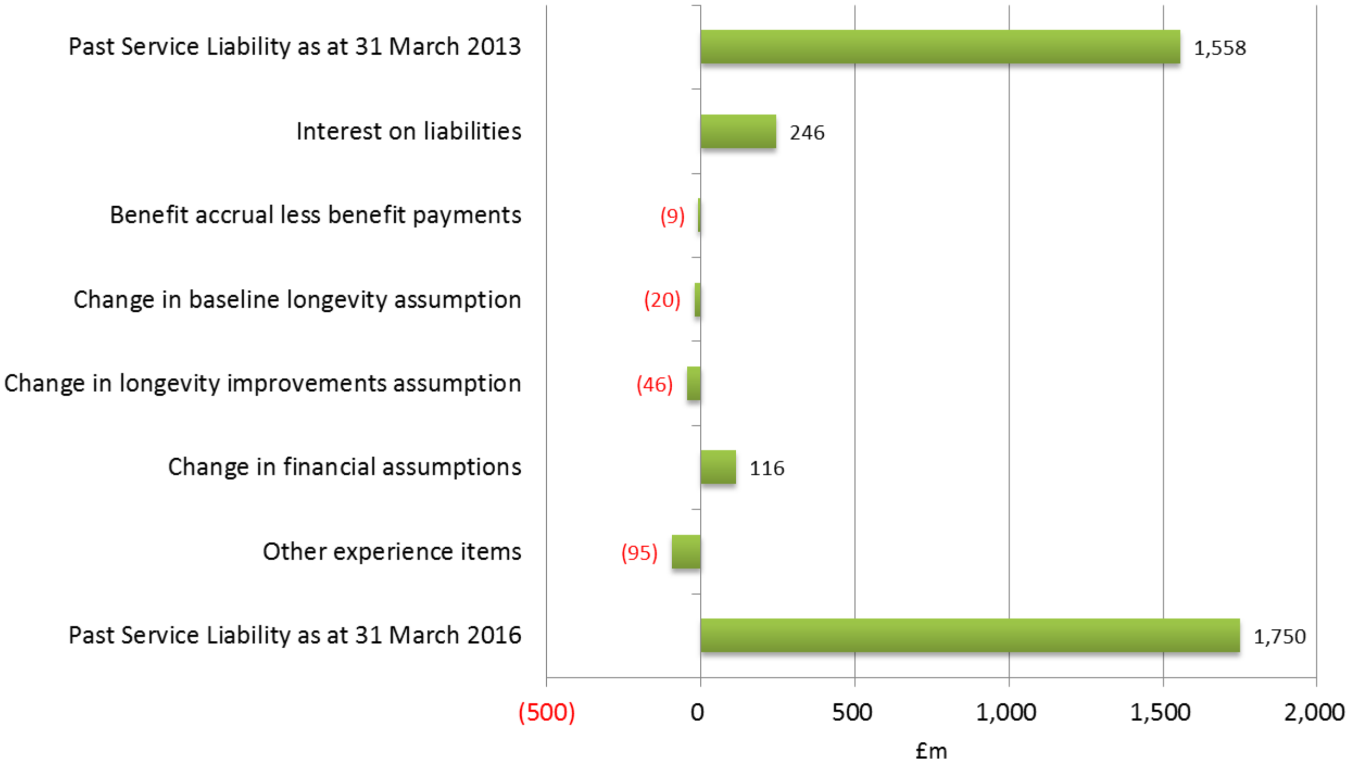
Female

Age	Incidence for 1000 active members per annum				
	Salary Scale	Death Before Retirement	Withdrawals	Ill Health Tier 1	Ill Health Tier 2
20	100	0.16	116.10	0.00	0.00
25	100	0.16	78.10	0.36	0.19
30	123	0.24	65.45	0.60	0.32
35	138	0.40	56.45	1.20	0.64
40	148	0.64	46.95	1.56	0.83
45	158	1.04	38.65	2.52	1.34
50	168	1.52	29.45	4.92	2.62
55	168	2.00	22.70	12.96	6.91
60	168	2.56	10.55	0.00	0.00

Appendix E: Change Reconciliation (individual schemes)

Past service liabilities

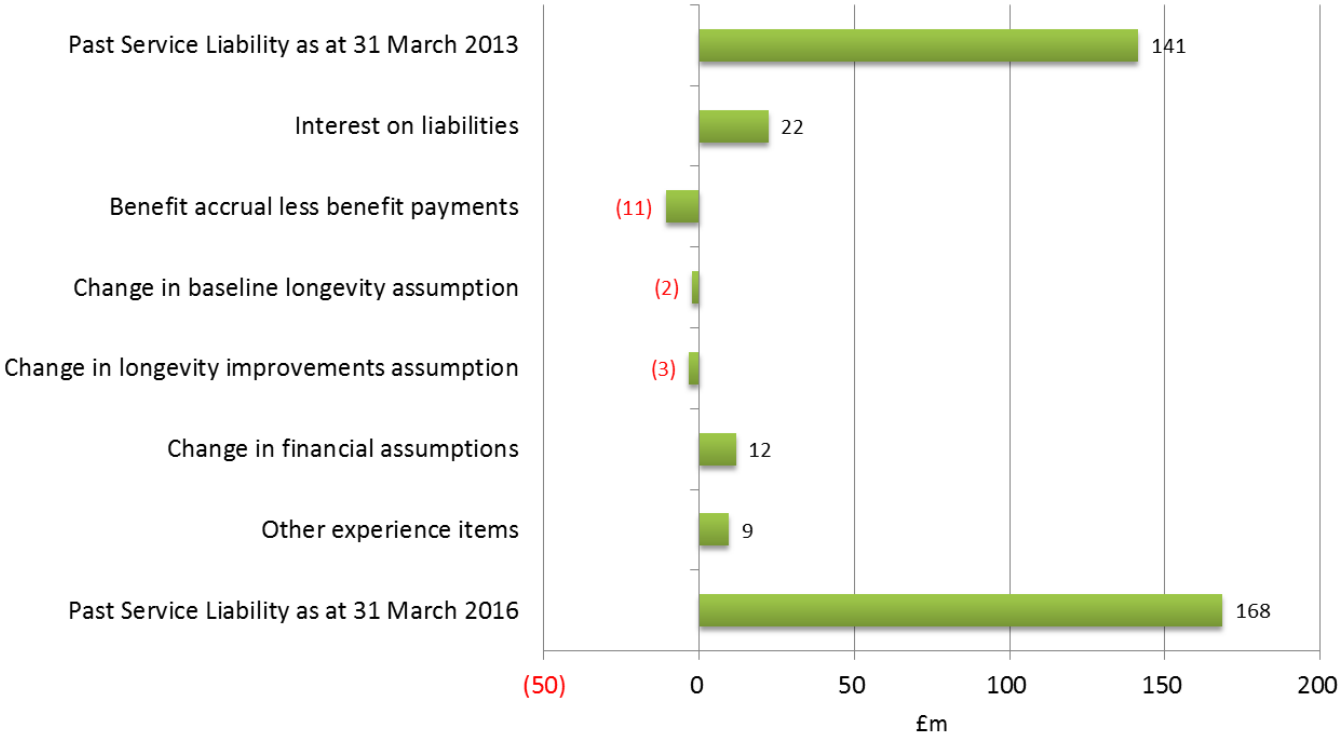
Summary of changes to the past service liabilities – GUS



Further comments on some of the items in this chart:

- There is an interest cost of £246m. This is broadly three years interest at 5.0% p.a. applied to the past service liabilities at 31 March 2013 (£1,558m).
- The impact of benefit accrual (net of benefits paid) has been a decrease to the liabilities of around £9m.
- The change in mortality assumptions (baseline and improvements) has given rise to a decrease to the liabilities of £66m. This is mainly due to the change in assumed longevity improvements.
- The change in financial assumptions from the previous valuation has led to an increase to the liabilities of £116m.
- Other experience items, primarily changes in the membership data, have served to decrease the value of the past service liabilities at this valuation by around £95m.

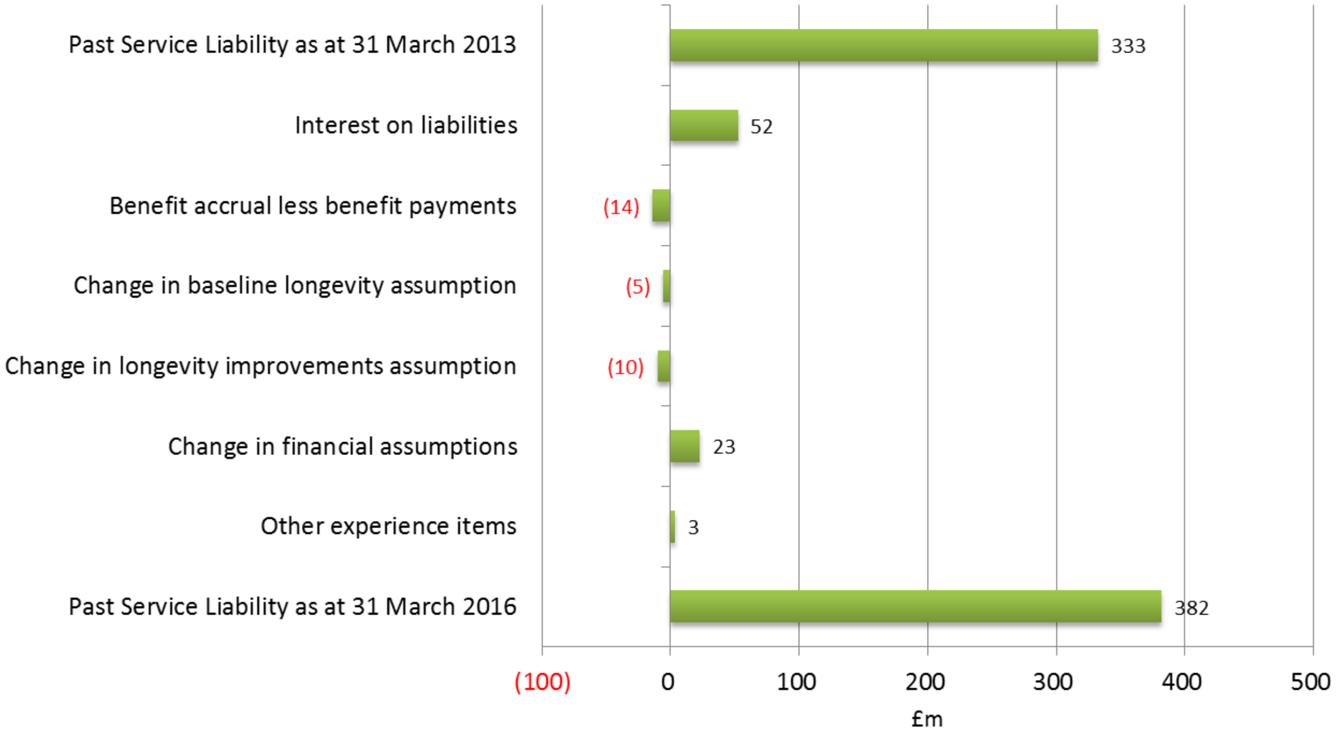
Summary of changes to the past service liabilities – Police Pension Scheme



Further comments on some of the items in this chart:

- There is an interest cost of £22m. This is broadly three years interest at 5.0% p.a. applied to the previous past service liabilities at 31 March 2013 (£141m).
- The impact of benefit accrual (net of benefits paid) has been a decrease to the liabilities of around £11m.
- The change in mortality assumptions (baseline and improvements) has given rise to a decrease to the liabilities of £5m. This is mainly due to the change in assumed longevity improvements.
- The change in financial assumptions from the previous valuation has led to an increase to the liabilities of £12m.
- Other experience items, primarily changes in the membership data, have served to increase the value of the past service liabilities at this valuation by around £9m.

Summary of changes to the past service liabilities – Teachers' Pension Scheme



Further comments on some of the items in this chart:

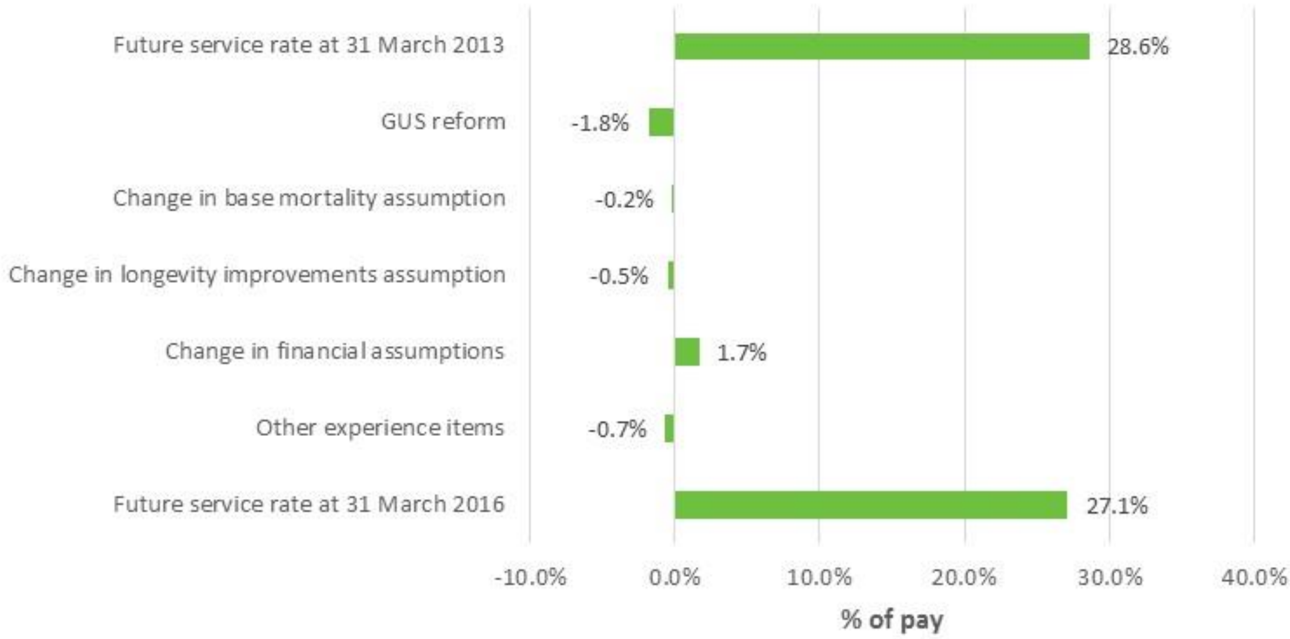
- There is an interest cost of £52m. This is broadly three years interest at 5.0% p.a. applied to the previous past service liabilities at 31 March 2012 (£333m).
- The impact of benefit accrual (net of benefits paid) has been a decrease to the liabilities of around £14m.
- The change in mortality assumptions (baseline and improvements) has given rise to a decrease to the liabilities of £15m. This is mainly due to the change in assumed longevity improvements.
- The change in financial assumptions from the previous valuation has led to an increase to the liabilities of £23m.
- Other experience items, primarily changes in the membership data, have served to increase the value of the past service liabilities at this valuation by around £3m.

Summary of changes to the past service liabilities – Non GUS Small Schemes

The results of the Tynwald, Judicial 1992, Judicial 2004 and Manual Workers (No.1) schemes can be seen in the tables on page 10. Broadly speaking, their analysis follows a similar pattern to those of the GUS, Police and Teachers' schemes with changes to the longevity assumptions decreasing the liabilities and interest and the change in financial assumptions increasing liabilities.

Future service rate

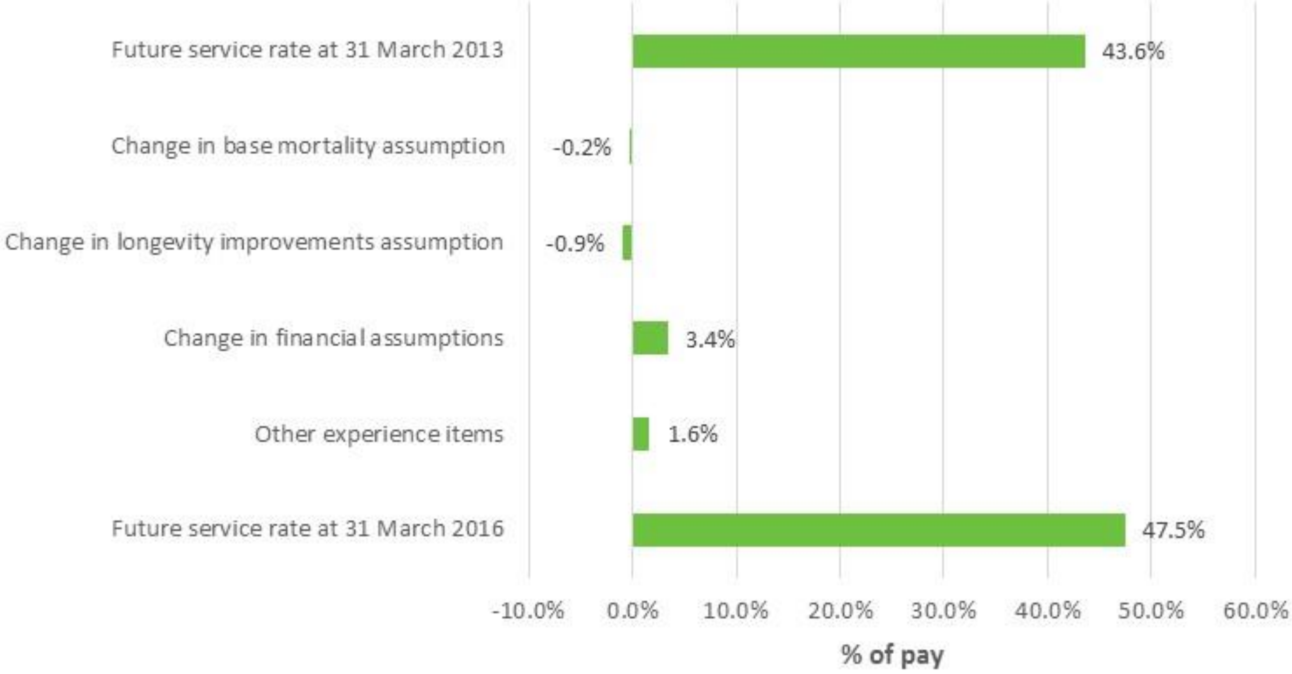
Summary of changes to the total future service rate – GUS



As GUS makes up the vast majority of the active membership of the Isle of Man pension schemes it is not a surprise that the change in future service rate analysis looks very similar to that of all the schemes combined. The GUS reform saving of 1.8% of pay is in relation to the 6% reduction in benefits accrued from 1 April 2017 onwards. As this analysis is of the total future service rate, the increase in employee contributions does not impact the analysis.

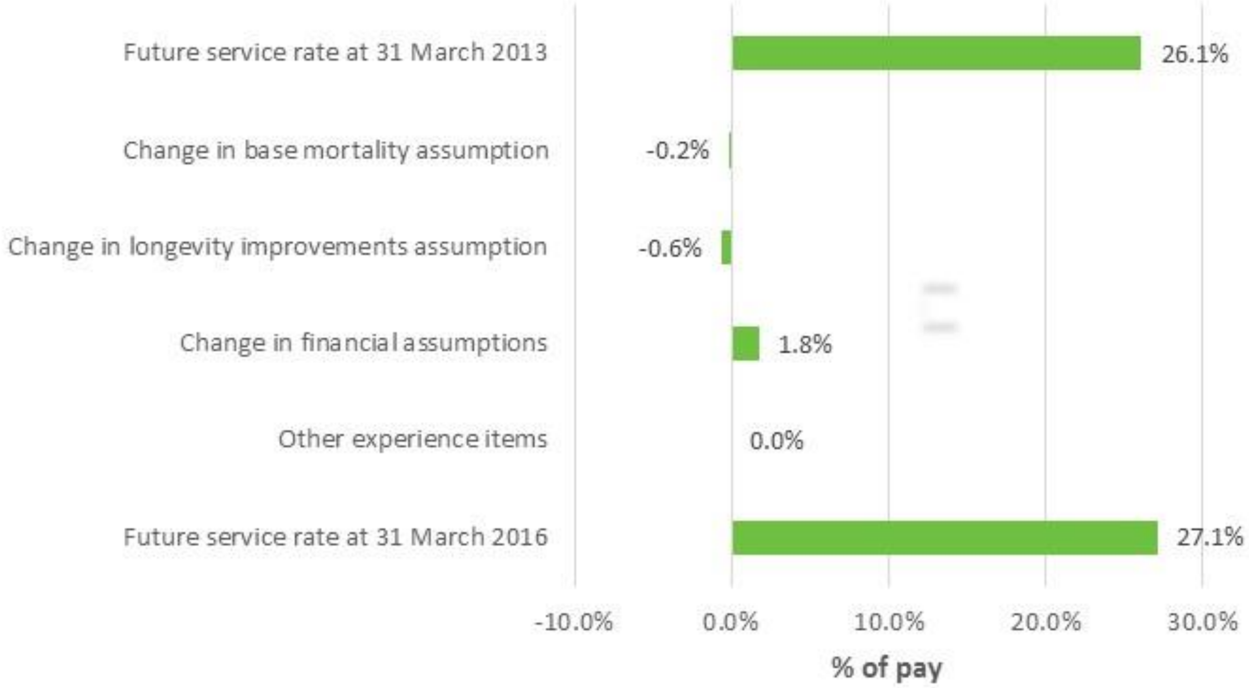
The saving under the "Other experience item" is due to more members accruing benefits in Section 1 (which has a lower future service rate compared to the other GUS sections) at 31 March 2016 compared to 31 March 2013.

Summary of changes to the total future service rate – Police Pension Scheme



The increase in the future service rate of the Police Scheme is mostly due to more members earning double accrual in the Police 1991 scheme which significantly increases the future service rate for this closed group of members.

Summary of changes to the total future service rate – Teachers' Pension Scheme



The change in the Teachers' pension schemes future service rate is very similar to that of GUS with changes to the longevity assumptions decreasing the future service rate and the change in financial assumptions increasing the future service rate.

Summary of changes to the total future service rate – Non GUS Small Schemes

The results of the Tynwald, Judicial 2004 and Manual Workers (No.1) schemes can be seen in the tables on page 12. Broadly speaking, their analysis follows a similar pattern to those of the GUS and the Teachers' schemes.