STATES OF JERSEY

JERSEY TEACHERS' SUPERANNUATION FUND (JTSF): ACTUARIAL VALUATION AT 31 DECEMBER 2018

Presented to the States on 8th January 2020
by the Chief Minister

STATES GREFFE

Jersey Teachers' Superannuation Fund

Actuarial valuation at 31 December 2018

Prepared for	JTSF Management Board
Prepared by	Jonathan Teasdale
Date	17 December 2019
Signed	

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Executive Summary

The key conclusions from the actuarial valuation at 31 December 2018 are set out below.

There was a surplus of £45.8M based on the assumptions adopted for the valuation

We have carried out a valuation of the Jersey Teachers' Superannuation Fund (the Fund) as at 31 December 2018. The purpose of the valuation is to review the operation of the Fund since the previous valuation, and to report on the financial condition of the Fund and the adequacy or otherwise of the contributions to support the benefits of the Fund.

Following advice from ourselves, the Management Board has confirmed that the assumptions adopted to determine the funding target for the Fund should be best-estimate assumptions. Under best-estimate assumptions the future outcome is just as likely to be better or worse than assumed. The rationale for using best-estimate assumptions is discussed in Appendix 4.

The main conclusions from the valuation are that:

- There is a past service surplus of £95.0M as at 31 December 2018.
- The value of anticipated future contributions is less than the value of future service benefits in respect of active members as at 31 December 2018, giving rise to a future service deficiency of £49.2M.
- Putting these two elements together, the Fund's overall surplus as at 31 December 2018 is £45.8M, equivalent to a **funding ratio** of 107.8%.

A key feature underlying the valuation results is that we have assumed the pension increase debt, amounting to £120.1M as at 31 December 2018, for which provision has been made in the Government balance sheet, is repaid in full by the Government over an appropriate period of time. There is currently no formal agreement between the Management Board and the Government of Jersey regarding the repayment of the pension increase debt.

Developments since the valuation date

The current funding position is estimated to be broadly similar to the position at the valuation date. The funding position has improved because investment returns since the valuation date have been above those assumed in the valuation but this has been offset by a reduction in expected future investment returns.

The surplus may be retained as a buffer against future adverse experience

Article 18(4) of the Teachers' Superannuation (Administration) (Jersey) Order 2007 requires the Chief Minister, within 3 months of this report being laid before the States of Jersey, to consult with the Management Board and to submit to the States proposals for disposing of the surplus. The proposals may consist of (but are not limited to) the following:

- If the surplus appears to be of a temporary nature, a recommendation that no action should be taken;
- The retention of a surplus no larger than the Actuary advises is a prudent reserve; or
- An increase in the benefits under the Fund.

Our advice to the Management Board is that the surplus of £45.8M is no larger than we would advise is a prudent reserve against future adverse experience. In particular, this takes account of the following:

- The funding strain expected when new members join the Fund, due to contributions being lower than the cost of accrual. The strain in relation to new entrants over the next 10 years may be of the order of £25M in total;
- There is currently no formal agreement between the Management Board and the Government of Jersey regarding the repayment of the pension increase debt; and
- The volatility inherent in the value of the Fund's assets relative to liabilities.

We therefore recommend the surplus is retained as a buffer against future adverse experience.

Jersey Teachers' Superannuation Fund

Actuarial valuation at 31 December 2018

Contents

Introduction

This report has been prepared for the Management Board. It considers the financial position of the Fund as at 31 December 2018.

Legislation

In accordance with Article 3(13) of the Teachers' Superannuation (Jersey) Law 1979, we have carried out a valuation of the Jersey Teachers' Superannuation Fund (the Fund) as at 31 December 2018.

Under the legislation, valuations of the Fund are required at least once every five years. However, it is the policy of the Management Board to require valuations at least every three years so as to keep the finances of the Fund under more frequent scrutiny. This valuation has been carried out two years after the previous valuation in order to achieve alignment with the timing of valuations of the Public Employees Pension Fund.

The results of the valuation are based on the Orders of the Fund in force at the valuation date.

Purpose

The purpose of the valuation is to review the operation of the Fund since the previous valuation, and to report on the financial condition of the Fund and the adequacy or otherwise of the contributions to support the pensions and other benefits of the Fund.

Previous valuation

Our valuation report dated 23 February 2018 considered the financial position of the Fund as at 31 December 2016.

Contributions since the previous valuation

Since the previous valuation contributions have continued to be paid at the rates specified in the Fund's Orders.

Next valuation

In accordance with the policy of the Management Board, the next valuation is due to be carried out as at 31 December 2021.

Scope of advice

The report is prepared for the Management Board. Please see Appendix 1 for further details of the scope of advice.

Words used

Our report includes some technical pension terms. The words shown in **bold print** are explained further in the glossary.

For brevity, we have also used the following shorthand:

Shorthand	What it means
Jersey RPI	All Items Retail Prices Index for Jersey
Orders	See Appendix 2
Salaries, Service	As defined in the Orders
Fund	Jersey Teachers' Superannuation Fund
Valuation date	31 December 2018

Snapshot view

The report concentrates on the Fund's financial position at the valuation date. As time moves on, the Fund's finances will fluctuate. If you are reading this report some time after it was produced, the Fund's financial position could have changed significantly.

Developments since the previous valuation

This section summarises the key developments since the previous valuation.

The financial health of the Fund depends fundamentally on how much cash is paid in, how well the assets perform, and on what benefits are paid out. The key developments since the previous valuation therefore include:

- The amount of contributions paid to the Fund.
- The actual returns on the Fund's investments.
- Whether there are changes to future expectations of benefit payments or investment returns.

These items are discussed later in this report. As well as these high level points, please note the developments below.

Dealing with the 2016 valuation surplus

The valuation as at 31 December 2016 revealed a surplus of £35.1M based on future increases in pensions and deferred pensions in line with the annual increase in the Jersey RPI.

Where a surplus is disclosed at a valuation, the Orders governing the Fund require proposals to be submitted to the States to dispose of any surplus. It was agreed that the surplus in the Fund be retained as a buffer against future adverse experience.

Changes to Fund Orders

Some minor amendments have been made to the Fund Orders since the previous valuation but none of these changes have had a material impact on the funding position of the Fund.

Information used

The information used for the valuation is summarised below.

To carry out the valuation, we have obtained information on:

- The assets held by the Fund.
- How benefit entitlements are calculated.
- Member data.

This section sets out a high level summary of the information used. Further details are included in Appendices 2 and 3.

Assets

The Scheme's assets (excluding AVCs) had an audited market value of £516.4M at the valuation date.

For further details, please see the Asset Data section.

Benefits valued

Members are entitled to benefits defined in the Orders. We are not aware of any established practice of granting additional discretionary benefits and no allowance for such benefits has been made in this valuation. A summary of the benefits valued is set out in Appendix 2.

Pension increase debt

The Fund provides pensions and other benefits which are subject to increases based on the rate of inflation. Prior to 2007, the cost of these pension increases was met on a "pay-as-you-go" basis by the employer as opposed to being funded in advance within the Fund.

As a result of a decision by the Government of Jersey effective in 2007 to pay pension increases (both those already awarded, and those due in future) from the Fund, a shortfall arose in respect of the indexation of benefits accrued before 2007. The total deficit in the Fund was assessed as £91.6M as at 31 December 2010. This deficit became known as the 'pension increase debt' and it was recognised (via a provision in the Government balance sheet) that this debt should be paid into the Fund over a period of time.

The debt should vary over time to reflect interest on the debt (which would increase the debt) and additional contributions (which would reduce the debt). However, the precise details of such a mechanism have yet to be formally agreed between the Management Board and the Government of Jersey. We have calculated the pension increase debt as at 31 December 2018 to be £120.1M based on the proposals submitted by the Management Board to the Government of Jersey in 2012.

For the purpose of this valuation, we have taken account of the pension increase debt as an asset of the Fund in line with its calculated value at 31 December 2018 of £120.1M.

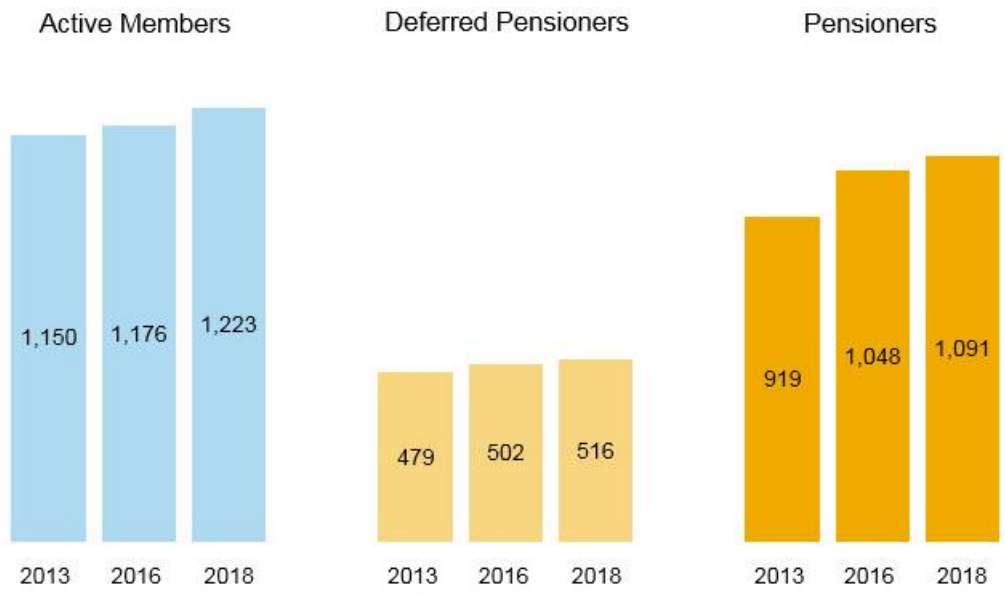
Whilst the mechanics of the debt repayment mechanism have not yet been formally agreed between the Management Board and the Government, the Government has publicly recognised a provision within its annual accounts for the debt to be settled in full and so it seems reasonable to rely on this for the purposes of the valuation.

The Management Board needs to be aware that, if it becomes clear at a future valuation that part or all of the debt will not ultimately be repaid, this may have a significant adverse effect on the Fund's financial position and, potentially, on members' future pension increases from that point on.

Membership data

The valuation calculations use membership data supplied by the Public Employees Pension Team of the Government Treasury Department at 31 December 2018.

The following chart illustrates how the membership profile is evolving. Please see Appendix 3 for a more comprehensive summary of the data.



The illustration shows that there has been an increase in the number of members in each of the membership categories since the last valuation.

Reliability of information

We have carried out general checks to satisfy ourselves that:

- The information used for this valuation is sensible compared with the information used for the previous valuation.
- The results of this valuation can be traced from the results of the previous valuation.

However, the results in our report rely entirely on the accuracy of the information supplied.

Valuation approach

This section describes the approach taken for the valuation calculations.

Adequacy of contributions

The contributions to the Fund are specified in the Orders governing the Fund and are paid so as to provide the benefits which will become payable to members when they retire or otherwise leave the Fund.

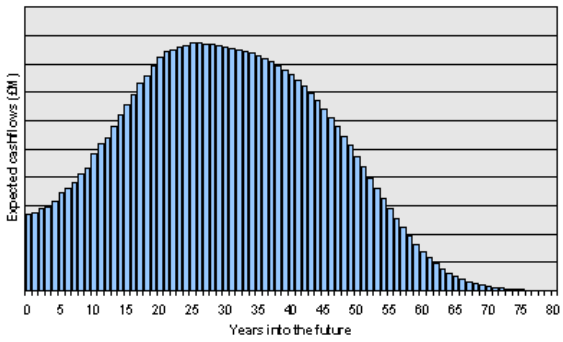
The factors affecting the Fund's finances are open to changing circumstances. Consequently it is necessary to review the operation of the Fund from time to time, by means of an actuarial valuation, to determine the adequacy or otherwise of the contributions to support the benefits payable under the Fund.

Funding target and funding objective

In our review we start with the known facts about the Fund at the valuation date, i.e. the benefit and contribution structure, the membership and the assets. We then must make assumptions about the factors affecting the Fund's future finances such as investment returns, pay increases and rates of mortality, leaving service and retirement.

In order to calculate the value placed on the benefits, the benefits paid out by the Fund are estimated for each year into the future. The estimated benefit payments are then 'discounted back' to the valuation date using an assumed investment return known as the **discount rate**.

The benefit payments from the Fund are expected to be made for a very long period and Fund cashflows are linked to future levels of inflation – the chart below shows the cashflow pattern for a typical pension scheme.



For the purpose of assessing whether the contributions are adequate to support the current benefits, it is appropriate to set a "**funding target**" and "funding objective".

The terms "surplus" and "deficiency" are referred to in the Fund's Orders but are not explicitly defined. In practice, we say there is a surplus if the **funding target** is more than fully met and we say there is a deficiency if the **funding target** is less than fully met.

The Management Board has determined the following **funding target** and funding objective:

- The **funding target** is that, based on best estimate assumptions, the assets and future contributions (including any contributions allocated to meet the pension increase debt) should be sufficient over the long term to support the benefits payable from the Fund in respect of the current members of the Fund.
- The funding objective is that the **funding target** should be met and that any variations in outcome should be dealt with following each valuation in accordance with the Orders, by adjustments to contributions and/or benefits or by carrying forward surpluses and deficiencies where appropriate.

Under best-estimate assumptions the future outcome is just as likely to be better or worse than assumed. The rationale for using best-estimate assumptions is discussed in Appendix 4.

For the purposes of assessing suitable assumptions at this valuation, the Management Board agreed that the Actuary should make allowance for continued future investment in growth assets, such as equities, by assuming that liabilities will be backed by assets in line with the Fund's strategic benchmark at the valuation date (as summarised within Appendix 6).

Changes from previous valuation

The funding objective is unchanged from the previous valuation although there have been changes to the assumptions used, as discussed below.

Valuation method

A description of the method used for the valuation calculations is set out in Appendix 5.

For previous valuations, the Management Board specified that contributions equal to 5.6% of salaries should be allocated to meet the pension increase debt, leaving employer contributions of 10.8% of salaries to cover the cost of future benefit accrual and administration expenses.

This approach has been retained for this valuation. The contributions to meet the pension increase debt are included in the value of assets used in calculating the past service surplus / deficiency, and employer contributions equal to 10.8% of salaries are allowed for in calculating the future service surplus / deficiency.

Valuation assumptions

The results of a valuation are very sensitive to the assumptions made. The financial assumptions have a significant effect on the results of a valuation. However, the other assumptions, particularly the mortality assumptions, are also very important.

Use of market-led financial assumptions

We have adopted a market-led approach, which involves:

- market-led financial assumptions for valuing the liabilities and future contributions; and
- valuing the assets at market value.

Key financial assumptions

The following table shows the key financial assumptions used for this valuation, with the assumptions used for the previous valuation shown alongside for comparison. Important points to bear in mind are:

- The differences between the rates have a bigger impact on the results of the valuation than the absolute levels of each assumption.
- The assumptions were derived from market yields at the valuation date to ensure compatibility with the market value of the assets.

	2018 (% p.a.)	2016 (% p.a.)
Discount rate (investment return)	5.75	5.70
Jersey RPI	2.95	2.85
Increases to pensions in payment and in deferment (excluding allowance for re-entry to active service)	2.95	2.85
General salary increases (in addition to promotional increases)	3.95	3.85

Full details of the financial assumptions used for this valuation, and the reasons for the changes compared to the previous valuation, are set out in Appendix 6 to this report.

Comparison of financial assumptions with 2016 valuation

Overall (ignoring any changes to the demographic assumptions), the financial assumptions we have used result in a slightly lower surplus than if the assumptions used for the 2016 valuation had been retained. The main reason for this is the small decrease in the discount rate (relative to Jersey RPI) used to value the liabilities.

Demographic assumptions

Other important assumptions used to value the liabilities include:

- the assumed future rates of mortality;
- the allowance made for the extent to which members will choose to exchange pension for a cash lump sum at retirement (at the rate of £13.50 cash lump sum for each £1 annual pension given up);
- the allowance for additional increases to salaries due to promotion, service or seniority; and
- the allowance made for the age at which members in each membership category will retire in future.

Comparison of demographic assumptions with 2016 valuation

We have reviewed the extent to which the demographic assumptions adopted for the 2016 valuation of the Fund remain appropriate for the current valuation as at 31 December 2018 after analysing the experience of the Fund during the 5 years 2014-2018 and taking account of other relevant data. Full details of the demographic assumptions used for this valuation, and the reasons for any changes compared to the previous valuation, are set out in Appendix 7 to this report.

In the light of this review we have made some changes to the demographic assumptions. The overall effect of these changes is to slightly increase the surplus.

General comments on the assumptions

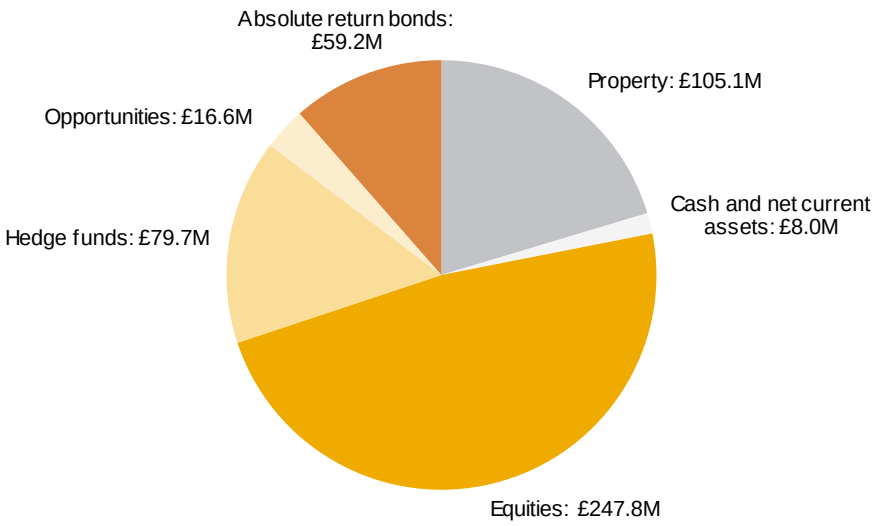
In our opinion, the financial and demographic assumptions, taken as a whole, are an entirely reasonable best-estimate basis for assessing the funding position of the Fund.

Asset data

The audited accounts for the Fund for the year ended 31 December 2018 show the assets were £517.4M of which £1.0M related to AVC assets.

The Fund's assets are held separately from those of the Government of Jersey. The audited Fund accounts for the year ended 31 December 2018 show its assets as £517.4M, of which £1.0M related to AVC assets.

The balance of the assets of £516.4M can be categorised as follows:



Valuation results

Based on the assumptions set out in the Valuation Approach section, the Fund surplus at 31 December 2018 is £45.8M, equivalent to a funding ratio of 107.8%.

A detailed breakdown of the results of the main valuation calculations is given below.

	£M
Actives	188.0
Deferred pensioners	52.3
Pensioners	301.2
Value of past service benefits	**541.5**
Value of investments	516.4
Value of pension increase debt	120.1
Total value of assets	**636.5**
Past service surplus / (deficiency)	95.0
Future service surplus / (deficiency)	(49.2)
Fund surplus / (deficiency)	**45.8**
Funding ratio	**107.8%**

The above table shows there is a past service surplus of £95.0M at 31 December 2018.

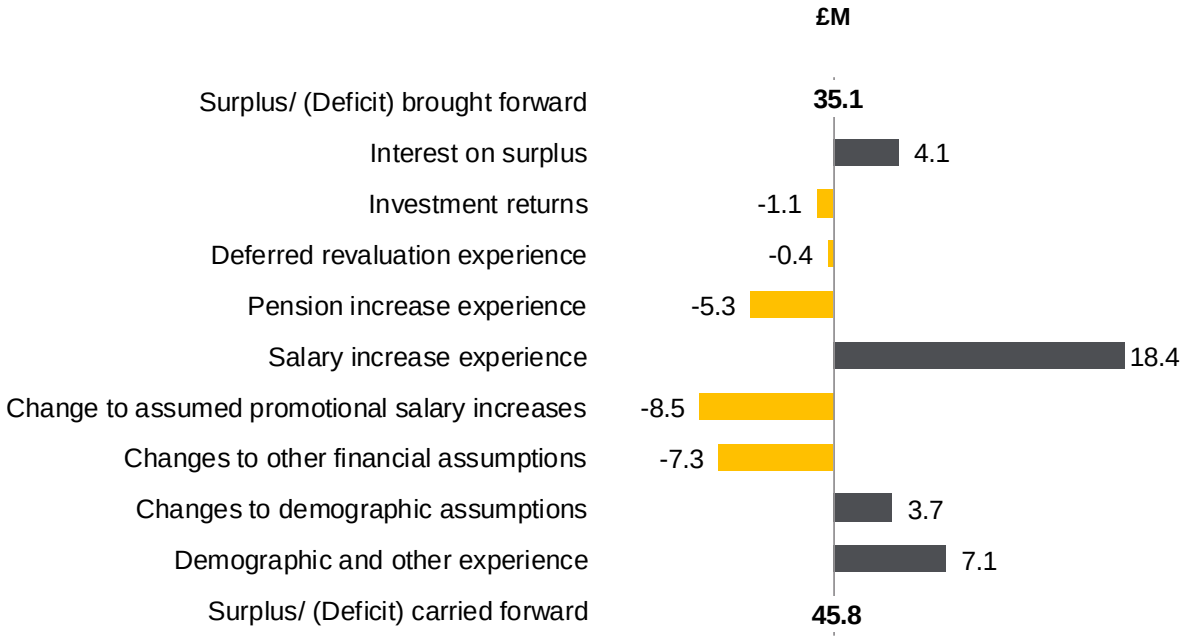
There is also a future service deficiency of £49.2M, i.e. the value of future contributions anticipated from employers and employees (disregarding any component of the employer contributions assumed to be allocated to meet the pension increase debt) is £49.2M less than the value of future benefit accrual in respect of current active members.

Putting this together, the overall Fund surplus at 31 December 2018 is £45.8M, equivalent to a **funding ratio** of 107.8%.

Reasons for change in funding position

The funding position has improved from a surplus of £35.1M at 31 December 2016 to a surplus of £45.8M at 31 December 2018.

The chart below shows the key reasons for the change in funding position between 31 December 2016 and 31 December 2018.



The analysis shows that the main factor which has contributed to the improvement in the funding position since the previous valuation has been lower actual salary increases than assumed at the previous valuation.

This factor has been partially offset by higher pension increases, the increase in the allowance for future promotional salary increases and the reduction in assumed future investment returns relative to inflation, which have worsened the position.

New entrant cost

The current contribution rate is insufficient to meet the cost of future benefits for new joiners to the Fund.

The table below shows the contribution rate required to meet the cost of future benefits for new joiners to the Fund at the valuation date, compared to the contributions expected to be received (which are fixed in the Orders).

For joiners in future years, the rate required is expected to gradually increase as continued improvements in life expectancy take effect.

	% of salaries
Cost of future benefits	18.5
Expenses	1.2
Total cost	**19.7**
Employer contribution rate (net of 5.6% allocated to meet pension increase debt)	10.8
Member contribution rate	5.0
Total contribution rate	**15.8**
Underpayment of contribution rate	**3.9**

Based on recent levels of new joiners (the total annual salary for new joiners in 2018 was £4.3M), the emerging strain on the Fund generated in relation to new entrants over the next 10 years may be of the order of £25M.

Assumptions

The assumptions used to calculate the cost of future benefits above are consistent with those used to calculate the main valuation results. In addition, we have assumed the following:

- New entrants are aged 32 on joining the Fund (this is an expected average age); and
- Two-thirds of the new entrants are females and one-third are males.

Risks and sensitivity analysis

The Fund faces a number of key risks which could affect its funding position.

This section comments on some of the key risks faced by the Fund. It concentrates on the deterioration to the Fund's finances that may arise in various hypothetical downside scenarios (where the actual experience is less favourable than the assumptions made at this valuation).

However, as the assumptions used to determine the **funding target** are best-estimate assumptions, it needs to be recognised that upside scenarios (where the experience is more favourable than the assumptions) are just as likely.

Key risks

Here is a recap of some of the key factors that could lead to deficiencies in future:

- Investment risks – the risk that the return achieved on the Fund's assets may be lower than allowed for in the valuation, and also that the assets may not move in line with the value of the benefits. The Fund invests in assets (e.g. equities) that are expected to achieve a greater return than the assets (i.e. index-linked gilts and investment grade derivatives) that most closely match the expected benefit payments (index-linked gilts and derivatives would provide a reasonable match but these assets are linked to UK RPI whereas the Fund's benefits are linked to Jersey RPI). The less matched the investment strategy is, the greater the risk that the assets may not move in line with the value of benefits.
- Liquidity risk – the risk that cashflows are higher than expected as members commute more than is assumed or take transfer values, possibly leading to the sale of assets at inopportune times.
- Longevity risk – the risk that members could live longer than foreseen, for example, as a result of a medical breakthrough. This would mean that benefits are paid for longer than assumed, resulting in a higher cost of providing the benefits.
- Options for Members – the risk that members may exercise options resulting in unanticipated extra costs. For example, members could swap less of their pension for cash at retirement than is assumed.
- Other risks – issues relating to climate change and other environmental risks as well as long-term uncertainty around geopolitical, societal and technological shifts may also impact on the funding and investments of the Scheme.

Quantifying the risks

To help the Management Board understand the susceptibility of the funding position on the valuation assumptions, we have considered the hypothetical impact on the liabilities of a reduction in future investment returns relative to inflation.

- A 0.25% p.a. decrease in the assumed rate of future investment returns (or a 0.25% p.a. increase in the inflation assumption) reduces the **funding ratio** by approximately 6% (to 102%).

Opposite step changes, such as what happens if the inflation assumption reduces by 0.25% p.a. for example, would improve the funding position by a broadly similar amount to the reduction identified above.

Investment strategy

The Fund's liabilities are influenced by Jersey inflation either directly via pension increases or indirectly via pay increases. The assets that most closely match the Fund's liabilities are index-linked gilts and investment grade derivatives. However, a large proportion of the Fund's assets are invested in asset classes such as equities which are expected to produce higher returns over the long term than those more closely matching assets.

The Management Board recognises the degree of risk, as well as the potential reward that this holds for the Fund. In particular the financial position of the Fund can be affected by sudden (or gradual) changes in market values of return seeking assets, changes in expected future returns and/or changes in inflation.

The investment strategy of the Fund is set by the Management Board and is kept under regular review.

Pension increase debt repayments

The valuation results rely on the pension increase debt being repaid over an appropriate period.

Summary

In summary, the Fund is highly susceptible to:

- Equity markets falling or inflation expectations rising; and
- Members living longer than expected.

Summary and conclusions

The surplus in the Fund at 31 December 2018 is £45.8M, equivalent to a funding ratio of 107.8%. We recommend that this surplus is retained as a buffer against future adverse experience.

The headlines at the valuation date are:

- There is a past service surplus of £95.0M.
- The overall surplus, after allowing for the anticipated shortfall in future contributions, is £45.8M. This corresponds to a **funding ratio** of 107.8%.

A key feature underlying the valuation results is that we have assumed the pension increase debt, amounting to £120.1M as at 31 December 2018, for which provision has been made in the Government balance sheet, is repaid in full by the Government over an appropriate period of time. There is currently no formal agreement between the Management Board and the Government of Jersey regarding the repayment of the pension increase debt.

The surplus of £45.8M will need to be dealt with in accordance with the terms of the Fund's Orders.

Developments since the valuation date

The current funding position is estimated to be broadly similar to the position at the valuation date. The funding position has improved because investment returns since the valuation date have been above those assumed in the valuation but this has been offset by a reduction in expected future investment returns.

Dealing with the surplus

Article 18(4) of the Teachers' Superannuation (Administration) (Jersey) Order 2007 requires the Chief Minister, within 3 months of this report being laid before the States of Jersey, to consult with the Management Board and to submit to the States proposals for disposing of the surplus. The proposals may consist of (but are not limited to) the following:

- If the surplus appears to be of a temporary nature, a recommendation that no action should be taken;
- The retention of a surplus no larger than the Actuary advises is a prudent reserve; or
- An increase in the benefits under the Fund.

Our advice to the Management Board is that the surplus of £45.8M is no larger than we would advise is a prudent reserve against future adverse experience. In particular, this takes account of the following:

- The funding strain expected when new members join the Fund, due to contributions being lower than the cost of accrual. The strain in relation to new entrants over the next 10 years may be of the order of £25M in total;

- There is currently no formal agreement between the Management Board and the Government of Jersey regarding the repayment of the pension increase debt; and
- The volatility inherent in the value of the Fund's assets relative to liabilities.

We therefore recommend the surplus is retained as a buffer against future adverse experience.

Appendix 1: Scope of advice

This report is prepared under the terms of the Actuary Agreement dated 14 July 2016 between Aon Hewitt Limited and the Management Board, on the understanding that it is solely for the benefit of the addressee.

Unless prior written consent has been given by Aon Hewitt Limited, this report should not be disclosed to or discussed with anyone else unless they have a legal right to see it.

Notwithstanding such consent, Aon Hewitt Limited does not accept or assume any responsibility to anyone other than the addressee of this report.

Appendix 2: Provisions of Fund

Orders

The Fund is governed by Orders made under the Teachers' Superannuation (Jersey) Law 1979 (as amended). At the valuation date, the provisions of the Fund were specified in the following Orders, namely:

a) The Teachers' Superannuation (Existing Members) (Jersey) Order 1986 – known as the Existing Members Order

b) The Teachers' Superannuation (New Members) (Jersey) Order 2007 – known as the New Members Order

c) The Teachers' Superannuation (Administration) (Jersey) Order 2007 – known as the Administration Order

Main features

The main features of the Fund in force at the valuation date are summarised on the following pages.

	Existing Members Order	New Members Order
Normal Retiring Age	60	65
Average Salary	Salary received during the best successive 365 days in the 3 years prior to leaving service or retirement	Salary received during the best successive 365 days in the 3 years prior to leaving service or retirement
Normal Retirement Pension	1/80th of average salary for each year of service	1/80th of average salary for each year of service
Cash at retirement	A tax free cash sum of 3/80ths of average salary for each year of service	Option to exchange up to 30% of commencing pension for a tax free cash sum of £13.50 for each £1 of pension given up.
Optional Retirement	No provision for early retirement in normal health	Generally any time up to 5 years before normal retiring age subject to 2 years' pensionable service. Members' pensions are reduced by 2.4% for each year the pension is being taken early.
Ill-Health Retirement	Subject to 2 years' service, immediate benefits on grounds of serious ill health or incapacity. Benefits based on enhanced pensionable service as set out in Article 52(3) of the Existing Members Order.	Subject to 2 years' qualifying service, immediate benefits on grounds of serious ill health or incapacity. Benefits based on enhanced pensionable service as set out in Article 18 of the New Members Order.

	Existing Members Order	New Members Order
Death in Service	1. Cash sum: a) Less than 5 years' reckonable service: a cash sum of 2/5ths of current salary for each year of service b) At least 5 years' reckonable service: a cash sum of twice current salary	1. Cash sum: a) Less than 5 years' qualifying service: a cash sum of 2/5ths of current salary for each year of service b) At least 5 years' qualifying service: a cash sum of twice current salary
	2. Spouse's Pension (widow / widower / civil partner): 50% of member's pension based on the pension which the member would have received on immediate ill-health retirement. Pensions are only payable to widowers in respect of service after 6 April 1988. An increased pension is payable for the first 3 months after the date of death (in most cases).	2. Spouse's Pension (widow / widower / civil partner): Subject to 2 years' qualifying service: 50% of member's pension, based on salary at death and pensionable service to normal retiring age.
	3. Dependant's Pension: An amount equal to a spouse's pension may be paid to an adult dependant – except that no dependant's pension can be awarded where a spouse's or child's pension is payable.	3. Dependant's Pension: Subject to 2 years' qualifying service: an amount equal to a spouse's pension may be paid to an adult dependant – except that no dependant's pension can be awarded where a spouse's pension is payable.
	4. Children's Pension: A pension is payable to each eligible child. The total payable is restricted to the equivalent of the spouse's pension, but no one child may receive more than half that sum. The child's pension is increased if a spouse's pension is not payable.	4. Children's Pension: Subject to 2 years' qualifying service, a pension is payable to each eligible child. The total payable is restricted to the equivalent of the spouse's pension, but no one child may receive more than half of that sum. The child's pension is doubled if a spouse's or dependant's pension is not payable.

	Existing Members Order	New Members Order
Death after Retirement	1. Spouse's Pension (widow / widower / civil partner): 50% of member's pension in respect of service for which a spouse's pension is payable according to Article 64. An increased pension is payable for the first 3 months after the date of death (in most cases).	1. Spouse's Pension (widow / widower / civil partner): From date of death, 50% of member's pension, ignoring any reduction for lump sum taken at retirement.
	2. Dependant's Pension: An amount equal to a spouse's pension may be paid to an adult dependant – except that no dependant's pension can be awarded where a spouse's or child's pension is payable.	2. Dependant's Pension: An amount equal to a spouse's pension may be paid to an adult dependant – except that no dependant's pension can be awarded where a spouse's pension is payable.
	3. Children's Pension: A pension is payable to each eligible child. The total payable is restricted to the equivalent of the spouse's pension, but no one child may receive more than half that sum. The child's pension is increased if a spouse's pension is not payable.	3. Children's Pension: A pension is payable to each eligible child. The total payable is restricted to the equivalent of the spouse's pension, but no one child may receive more than half that sum. The child's pension is doubled if a spouse's or dependant's pension is not payable.
	4. Cash sum For members with less than 10 years' reckonable service, a lump sum equal to 5 times the annual pension less the sum of the pension payments made to the member. For members with 10 or more years' reckonable service, a lump sum equal to the member's average salary less the sum of the pension and cash payments made to the member.	4. Cash sum None

	Existing Members Order	New Members Order
Leaving Service	Refund of contributions with 3% p.a. interest (not available if left with 5 or more years' qualifying service) or a deferred pension payable at normal retiring age or a transfer value payable to a new employer's pension scheme or to a personal pension scheme On future re-entry to the Fund, earlier service may be aggregated with current service.	Refund of contributions with 3% p.a. interest (not available if left with 5 or more years' qualifying service) or subject to 2 years' qualifying service at any age: a deferred pension payable at normal retiring age or a transfer value payable to a new employer's pension scheme or to a personal pension scheme On future re-entry to the Fund, earlier service may be aggregated with current service.
Voluntary Early Retirement	No provision	Subject to being over age 55 (or 50 in special circumstances) and not being entitled to an immediate pension from the Fund, the employer may offer a supplementary pension equal to the member's deferred pension entitlement (which may be enhanced), payable until the date the deferred pension is due.
Additional Voluntary Contributions	May be paid to purchase extra years of service	
Increases to Pensions	Annual increases in line with the Jersey RPI, but not guaranteed where actuarial review has disclosed the financial condition of the Fund is no longer satisfactory. The first increase will be proportionate to the period of retirement in the first year.	
Contributions by members	6% of salary	5% of salary
Contributions by Employers	16.4% of salary	16.4% of salary

Appendix 3: Membership data

Active members at 31 December 2018 *(31 December 2016)*

Active members		Number	Average age	Total salaries (£000 p.a.)	Average salaries (£ p.a.)	Average service (years)
Men	2018	382	43.6	22,011	57,620	11.5
	2016	*372*	*43.8*	*20,939*	*56,287*	*13.3*
Women	2018	841	40.9	44,551	52,974	10.4
	2016	*804*	*41.4*	*41,507*	*51,626*	*11.4*
Total	**2018**	**1,223**	**41.7**	**66,562**	**54,425**	**10.8**
	2016	*1,176*	*42.1*	*62,446*	*53,100*	*12.0*

Notes:

1) The average ages shown above are unweighted.

2) Figures shown are full-time equivalent salaries at 1 January 2019 (for 2018 valuation) and at 31 December 2016 (for 2016 valuation).

3) Average service includes added years arising from additional voluntary contributions.

Deferred pensioners at 31 December 2018 *(31 December 2016)*

Deferred pensioners		Number	Average age	Total pensions (£000 p.a.)	Average pension (£ p.a.)
Men	2018	153	50.6	998	6,520
	2016	*144*	*51.4*	*848*	*5,890*
Women	2018	363	52.4	1,810	4,987
	2016	*358*	*52.9*	*1,669*	*4,661*
Total	**2018**	**516**	**51.9**	**2,808**	**5,442**
	2016	*502*	*52.4*	*2,517*	*5,014*

Notes:

1) The average ages shown above are unweighted.

2) The pension amounts shown above include pension increases up to and including the following 1 January.

Pensioners at 31 December 2018 *(31 December 2016)*

Pensioners		Number	Average age	Total pensions (£000 p.a.)	Average pension (£ p.a.)
Men	2018	380	71.5	8,931	23,502
	2016	*366*	*70.9*	*8,032*	*21,944*
Women	2018	608	70.7	10,873	17,884
	2016	*562*	*69.9*	*9,411*	*16,746*
Dependants	2018	103	75.5	846	8,212
	2016	*120*	*74.7*	*804*	*6,697*
Total	**2018**	**1,091**	**71.4**	**20,650**	**18,928**
	2016	*1,048*	*70.8*	*18,246*	*17,411*

Notes:

1) The average ages shown above are unweighted.

2) The pension amounts shown above include pension increases up to and including the following 1 January.

3) "Dependants" consists of spouses, civil partners, children and adult dependants in receipt of a pension.

Appendix 4: Rationale for best-estimate assumptions

Best-estimate assumptions

Following advice from ourselves, the Management Board has confirmed that the assumptions adopted to determine the **funding target** should be best-estimate assumptions. The rationale for using best-estimate assumptions is discussed below.

Range of assumptions

The results of a valuation are sensitive to the assumptions made and therefore the choice of appropriate assumptions is important.

There is a wide range of assumptions that could be used ranging from optimistic, through best-estimate to cautious:

- Under optimistic assumptions the future outcome is more likely to be worse than assumed;
- Under cautious assumptions the future outcome is more likely to be better than assumed;
- Under best-estimate assumptions the future outcome is just as likely to be better or worse than assumed.

The Management Board has a duty to protect members' benefits. Therefore it would not be appropriate to use optimistic assumptions when determining the adequacy or otherwise of the contributions to support the benefits payable under the Fund.

This leaves a choice of assumptions in the range from best estimate to cautious. The more cautious the valuation assumptions, the greater the valuation liabilities will be and consequently the greater the possibility of members' benefits or future pension increases having to be cut back (or members' or employers' contributions having to be increased) if there is a deficiency.

Advantages of using best-estimate assumptions (and disadvantages of using more cautious assumptions)

The advantage of using best-estimate assumptions is that it complies with the principle of only cutting back on the members' pensions where this appears genuinely necessary.

Using more cautious assumptions would lead to a larger deficiency, which may potentially trigger reductions to benefits or future pension increases (or increases to members' or employers' contributions). In the long term, given the extra returns targeted under the Fund's investment strategy, there would be quite a high probability that experience would prove more favourable than assumed, leading to surpluses at later valuations. Therefore, using more cautious assumptions may result in cutting back benefits (or increasing contributions) in a way that with hindsight was unnecessary.

Disadvantages of using best-estimate assumptions (and advantages of using more cautious assumptions)

The disadvantage of using best-estimate assumptions is that it leads to a larger chance of actual Fund experience being worse than assumed than if more cautious assumptions are used. This increases the likelihood of deficiencies arising at later valuations which have to be dealt with through future reductions in benefits, or by increasing members' or employers' contributions. If experience is adverse, the reductions in benefits (or increases in contribution) eventually required may need to be bigger at that time than if they had been made earlier (and therefore impacting disproportionately on a later "generation" of members). Although there is no provision in the Orders for the Fund to be discontinued, this could be particularly problematic if the Fund were discontinued. It could be equally problematic if the financial strength of the Government of Jersey were to become poor. Significant benefit reductions may be required in such situations.

A further potential disadvantage of using best-estimate assumptions is that it involves anticipating a degree of outperformance from growth assets, which may limit the Management Board's scope to reduce the Fund's investment allocation to growth assets in future.

Recommendation

Following advice from ourselves, the Management Board has confirmed that the assumptions used to determine the **funding target** should be best-estimate because:

- It complies with the principle of only cutting back on members' pensions where this appears genuinely necessary, and
- The Management Board does not currently consider the financial strength of the Government of Jersey to be poor.

Appendix 5: Valuation method

Valuation method

The valuation method for the main valuation calculations is known as the "aggregate funding" method. To establish whether the **funding target** is met, we have compared the value of the benefits payable in respect of all current members (including pensioners and deferred pensioners), with the sum of the following:

- the value of the Fund's existing assets;
- the pension increase debt; and
- the value of future contributions due from and in respect of current active members.

This approach involves taking credit for the future pension increase debt repayments. For previous valuations, the Management Board specified that contributions equal to 5.6% of salaries should be allocated to meet the pension increase debt, leaving employer contributions of 10.8% of salaries to cover the cost of future benefit accrual and administration expenses.

This approach has been retained for this valuation. The contributions to meet the pension increase debt are included in the value of assets used in calculating the past service surplus / deficiency, and employer contributions equal to 10.8% of salaries are allowed for in calculating the future service surplus / deficiency.

Value of liabilities and future contributions

To calculate "the value" of the benefits payable we use our assumptions to estimate the payments which will be made from the Fund throughout the future lifetimes of current members, pensioners, deferred pensioners and their dependants. We then calculate the amount of money which, if invested now, would be sufficient to make these payments in future, using our assumptions about investment returns. The same technique is adopted to value future contributions to the Fund.

Value of assets

We have taken the assets into account at their market value.

Appendix 6: Financial assumptions

Introduction

In this appendix we describe the financial assumptions. The financial assumptions that have been chosen are consistent with the **funding target** and each assumption is intended to represent a reasonable best estimate of the future.

When assessing a set of financial assumptions, greater importance should be attached to the relative differences between the assumptions, rather than to the individual assumptions in isolation. This is because the differences have a greater effect on the results of the valuation than the absolute values of each assumption.

Discount rate (investment return)

The most important individual assumption in terms of its impact on the overall valuation results is the choice of **discount rate**, i.e. assumed future investment returns. The discount rate is used to value payments due out of the Fund (benefit payments) and into the Fund (future contributions).

For valuing the liabilities, an assumption which could be described as “low risk” would be to discount future benefit payments at the market yields available on index-linked gilts at the valuation date. This approach recognises that a good matching asset for the Fund’s cash flows is obtained by investing in index-linked gilts of appropriate term.

It is common for UK occupational schemes to adopt a **funding target** which incorporates a higher discount rate than the returns available on gilts. The consequence of using a higher discount rate is that a lower **funding target** is adopted. This does not mean that the actual cost of providing the benefits is reduced, but it does result in an increase in disclosed surpluses or decrease in disclosed deficiencies.

The **funding target** adopted requires that the assumptions chosen should be reasonable best estimates. In principle, we need to set the discount rate at this valuation by considering the best estimate returns available on the Fund's invested assets, over the period starting now and ending in the long-term future. The expected returns depend critically on what asset classes are assumed to be held.

The discount rate has been determined using the strategic investment benchmark at the valuation date as a starting point (with assets held within each class consistent with those held at the valuation date). The best-estimate returns assumed for each asset class as at the valuation date are set out in the table below.

Assets at 31 December 2018	Strategic benchmark %	Best-estimate long-term return
– Equities	50.0	7.2% p.a.
– Property	15.0	5.3% p.a.
– Hedge Funds	15.0	3.4% p.a.
– Opportunities	10.0	7.2% p.a.
– Absolute Return Bonds	10.0	3.4% p.a.
Total	**100.0**	**6.0% p.a.***

* Weighted average of median returns on component asset classes. The median returns on those asset classes represent best-estimate returns as at the valuation date over the 30 year period from the valuation date.

Applying a weighted average, this approach would suggest a discount rate equal to 6.0% p.a. based on the strategic investment benchmark at the valuation date.

We understand that the Management Board is planning to reduce the risk within the investment strategy by divesting part of its holding in equities into other asset classes. We anticipate that this will lead to slightly lower expected returns on the Fund as a whole. We have reflected the anticipated impact of this change by applying a reduction of 0.25% p.a. to the above weighted return, resulting in an assumed discount rate for the 2018 valuation of 5.75% p.a..

The same discount rate has been used for valuing future contributions.

Increases to pensions in payment and deferred pensions

The Fund provides for annual increases to pensions in payment and deferred pensions in line with increases in the Jersey RPI.

The Bank of England produces data, based on UK fixed and index-linked gilt markets, which can be used to calculate market-implied ("break-even") UK RPI inflation. At 31 December 2018, the single break-even UK RPI inflation assumption that would give approximately the same value of liabilities as using the full Aon UK RPI curve is 3.4% p.a..

Aon's view is that at the valuation date, break-even inflation over the duration of the liabilities overstates likely inflation over that period, due to supply/demand distortions in the gilt market. Our best estimate is that actual inflation over the duration of the liabilities will be around 0.2% p.a. below break-even inflation (this difference is called an "inflation risk premium"). We have allowed for this in the valuation.

We have therefore assumed increases in UK RPI inflation will be 3.2% p.a..

Given that the two economies have a tied currency and the same interest rates, our view is that over the medium to long term, underlying Jersey inflation can be expected to be fairly close to UK inflation. However, due to the different current calculation methodologies for calculating RPI in Jersey and in the UK, assuming Jersey RPI is equal to UK RPI is consistent with assuming that underlying inflation in Jersey will be a little higher than in the UK.

Over the period since 1990 there have been periods where Jersey RPI inflation has been considerably higher than UK RPI inflation. However, the gap between UK and Jersey RPI has continued to fall and, since 2010, the 5 year average of Jersey RPI has been lower than the 5 year average of UK RPI.

Given that we would expect Jersey RPI to be lower than UK RPI due to the different current calculation methodologies for calculating RPI and consistent with actual experience since 2005, we have assumed that Jersey RPI will be on average equal to UK RPI less 0.25% p.a.. This is consistent with assuming that underlying inflation in Jersey will be marginally higher than in the UK.

The assumption for Jersey RPI is therefore 2.95% p.a..

General salary increases

In recent years, pay awards have generally been at or below Jersey RPI, reflecting a policy of pay restraint.

On the basis that recent experience may not be representative of the long-term future we have retained an allowance for general salary inflation of 1% p.a. above Jersey RPI, in line with the assumption adopted for the previous valuation.

Promotional salary increases

In addition to the allowance for general salary increases, an explicit age-related promotional scale was adopted at the 2016 valuation (a different scale is used for males and females).

Experience over 2014-2018 suggests that promotional increases have been higher than assumed. Having discussed with the Treasury and Exchequer, we understand that this may have arisen due to a reduction in starting salaries with no change in salary at higher grades, resulting in higher promotional increases at younger ages. The experience also suggests that promotional increases continue at older ages, and this has happened to a greater extent for women (conversely, women tend to have had lower pay growth mid-career).

Considering the experience, we have increased the allowance for promotional salary increases at this valuation.

The allowance included for promotional salary increases (in addition to general salary increases) at specimen ages is shown below, with the assumptions adopted for the 2016 valuation shown in brackets:

Age	Promotional salary increases	
	Males	Females
20	4.5% p.a. (3.2% p.a.)	4.5% p.a. (3.1% p.a.)
25	3.4% p.a. (2.8% p.a.)	3.4% p.a. (2.7% p.a.)
30	2.3% p.a. (2.3% p.a.)	2.0% p.a. (2.4% p.a.)
35	1.5% p.a. (1.5% p.a.)	1.3% p.a. (1.3% p.a.)
40	1.0% p.a. (1.0% p.a.)	1.0% p.a. (1.1% p.a.)
45	0.5% p.a. (0.5% p.a.)	0.8% p.a. (0.8% p.a.)
50	0.5% p.a. (0.4% p.a.)	0.8% p.a. (0.4% p.a.)
59	0.5% p.a. (0.0% p.a.)	0.8% p.a. (0.0% p.a.)
60	0.0% p.a. (0.0% p.a.)	0.0% p.a. (0.0% p.a.)

Expenses

Excluding investment-related expenses (which are taken into account in the net investment return assumption), we have analysed the expenses of administering the Fund during 2017-2018 and compared this with the assumption of 1.2% of salaries adopted at the 2016 valuation. Our analysis confirmed that the 2016 valuation assumption remains appropriate.

Appendix 7: Demographic assumptions

Introduction

In this appendix, the demographic assumptions are described and we comment on how they compare with actual experience. The demographic assumptions that have been chosen are consistent with the **funding target** set out in the "Valuation approach" section of this report and each assumption is intended to represent a reasonable best estimate of the future.

Mortality rates before retirement

There have been only 3 deaths before retirement during 2014-2018. As there is insufficient data to carry out a credible analysis, and this assumption has little impact on the liabilities, we have retained the assumptions used for the 2016 valuation.

Specimen rates of death before retirement assumed at this valuation are set out below (per 100,000 members):

Age	Males	Females
30	20	23
35	30	34
40	48	49
45	80	68
50	138	101
55	215	173
60	323	274

Mortality rates after retirement – current mortality rates

We have analysed the mortality experience of the Fund over the five year period from 1 January 2014 to 31 December 2018. We have compared against both the tables used at the 2016 valuation (i.e. the SAPS S2 tables) and the latest set of standard tables (i.e. the SAPS S3 tables).

We have set out below the ratio of actual deaths to expected deaths over the period (weighted by pension amount), with expected deaths based on 100% of the standard SAPS S2 or S3 "All lives" tables.

The 2016 valuation used the S2 "All lives" tables with a scaling factor of 95%.

Mortality assumption	Males	Females
100% of SAPS S2 "All lives"	98%	83%
100% of SAPS S3 "All lives"	99%	89%

The experience investigation over the five years to 31 December 2018 indicates that there have been fewer female deaths but slightly more male deaths (by pension amount) than suggested by the assumptions adopted at the previous valuation.

However, the small amount of experience data (107 deaths) over the 2014-2018 period means that the results of the analysis are not definitive.

The increase in the female scaling factor from the S2 tables to S3 tables is because S3 tables have significantly more public sector mortality data than the S2 series tables. For females in particular, the public sector schemes which have submitted data have lighter mortality and somewhat higher pensions than the private sector schemes that have submitted data. This means that the S3 All Female Pensioner tables (S3PFA) have lighter mortality than the S2 equivalent (S2PFA).

For the 2018 valuation, we have updated to the latest tables and assumed current mortality rates in line with the SAPS S3 "All lives" tables (S3PXA) with 95% scaling factor.

For males, this retains a similar level of current mortality as assumed in the 2016 valuation. For females, this represents slightly lighter mortality than assumed in the 2016 valuation, to partially reflect the lighter mortality experienced in the last 5 years.

Taking into account the nature of the workforce, we believe that this is a reasonable best-estimate assumption.

Mortality rates after retirement – allowance for improvements

It is not straightforward to make an assumption about future rates of mortality improvement. In forming a best-estimate assumption, we believe it is appropriate to have regard to:

- Current trends;
- Long-term trends;
- Observed generational differences, which suggest faster improvements within certain generations of pensioner (known as the cohort effect); and
- The outlook for future medical advances.

However, the allowance made must inevitably be subjective.

In determining an allowance for future improvements in life expectancy, it makes sense to consider the near future and longer term separately:

- Recent improvements in life expectancy are likely to be the best guide for what will happen in the near future and so improvements in the near future are best modelled by continuing recent trends.
- The forces driving longer term improvements may be very different to those behind recent improvements. This means that the assumption for long-term improvements is more subjective and should take into account analysis of historic long-term rates of improvements (and what has caused them) as well as opinions on what might happen in the future.

In November 2009, the Continuous Mortality Investigation (CMI), a group set up by the UK Actuarial Profession, published its Mortality Projections Model. The model uses complex methods for taking recent rates of mortality improvements and blending these to the long-term rate of improvements. The latest annual update to the model was published in March 2019. Projections from the 2018 version of the CMI's model are known as the 'CMI_2018' projections. Apart from the long-term rate of improvements, the CMI has provided default values for the model inputs such as the smoothing parameter (S_κ) and a new parameter for the initial addition to mortality (A), which are known as the 'Core Projections'.

The responsiveness of CMI_2018 to new data can be controlled by changing the parameter $S\kappa$. A higher value applies more smoothing of experience data, which means an increase in life expectancy, resulting in an increase in the actuarial value of liabilities. For CMI_2018, the CMI suggest a core assumption of $S\kappa=7.0$.

The new parameter ("A") allows for additional improvements to the historic initial rates and near future. The choice of this value directly affects the rates of historic improvements, with this addition tapering to zero over the next 10 years or so. A greater value of parameter "A" results in an increase in life expectancy, and hence an increase in the actuarial value of liabilities. The core value in CMI_2018 is A=0%.

At Aon we have analysed the UK population by socio-economic group; this suggests that longevity improvements have varied across the socio-economic spectrum for some time. (Although that analysis does not cover Jersey, we have no reason to believe the trends in Jersey would be different.) In particular, we note that the average Defined Benefit pension scheme membership does not appear to have seen such a large fall in recent longevity improvements as the national population, to which the CMI model is calibrated. Our conclusion is that there is good reason to allow for higher longevity improvements expected to be experienced by Defined Benefit pension scheme members by increasing the new parameter "A" to 0.5%, with $S\kappa$ set to the core parameter of 7.0 (for the previous valuation, this feature was allowed for by increasing the core parameter $S\kappa$). This results in higher assumed life expectancies at age 65 compared with the suggested core assumption.

Our analysis also suggests that future long-term improvements in mortality rates of between 1.0% p.a. and 2.0% p.a. for both men and women may be considered reasonable.

We have therefore assumed future improvements in mortality rates in line with the CMI_2018 Core Projections model with Sκ=7.0, A=0.5% and a long-term rate of improvement of 1.5% p.a..

Retirement in normal health

We have assumed that active members will retire at the ages set out in the following table:

Membership category	Normal Retirement Age	Assumed age at retirement
Existing Members (actives and deferreds)	60	60
New Members (actives)	65	63
New Members (deferreds)	65	65

The analysis of the retirement experience over the period 2014-2018 for the Existing Members shows the average retirement age to be in line with the assumption adopted for the 2016 valuation.

There is only a small amount of experience data (9 retirements in normal-health) for New Members over the period 2014-2018 so we have retained the assumptions used for the 2016 valuation.

Retirement in ill-health

Over the period 2014-2018, there have been 12 ill-health retirements. As this is insufficient data for a credible analysis, we have not carried out a detailed analysis.

Experience prior to the 2013 valuation was broadly in line with the current assumptions so we have retained the assumptions used since the 2013 valuation.

Specimen rates of retirement due to ill-health assumed at this valuation are set out below (per 100,000 members):

Age	Males	Females
30	16	24
35	50	50
40	120	83
45	310	195
50	866	476
55	1,487	935

Allowance for commutation

The 2016 valuation made allowance for New Members to commute 21% of their pension on retirement (there is no provision for Existing Members to commute pension for an additional lump sum).

Based on the 11 retirements from this category during 2014-2018, New Members have commuted on average about 23% of their pension on retirement. The amount of data is not sufficient for the analysis to be statistically credible.

We note that the experience is broadly in line with the assumption adopted for the Public Employees Pension Fund (PEPF) valuation as at 31 December 2016 which is that members commute 22% of their pension on retirement. There is much more experience of commutation rates in PEPF so we suggest this is used as a guide in the absence of sufficient specific data for JTSF.

We have therefore assumed that New Members will commute 22% of their pension on retirement.

Withdrawal rates

We have carried out an analysis comparing the actual number of withdrawals over 2014-2018 with the expected number of withdrawals. Our analysis showed that the actual number of withdrawals has been lower than expected for women and higher than expected for men.

The experience analysis at the 2013 valuation suggested that experience over a longer period to 2013 was broadly in line with expectations for females, although withdrawals were slightly higher than expected for males. It is not clear to us that recent experience will be a good guide to the future. So, in light of the longer term experience, we have retained the assumptions used since the 2013 valuation.

Specimen rates of withdrawal assumed at this valuation are as follows (per 1,000 members):

Age	Males	Females
25	52	87
30	44	68
35	34	56
40	28	32
45	24	23
50	18	23
55	24	32
59	28	53
60	0	0

Family assumptions

Family assumptions cover:

- the proportions of deaths of members and pensioners which give rise to a spouse's, civil partners' or dependant's pension;
- the age difference between the member and spouse/dependant at date of death;
- the proportions of widows and widowers who subsequently get remarried; and
- the allowance for children's pensions.

There is insufficient data to carry out a credible experience analysis for these assumptions.

We have retained the assumptions adopted for the 2016 valuation, as follows:

1) 85% of males and 70% of females are married, or have a dependant, at age 65 (or earlier death), reducing thereafter in line with spouse's mortality rates.
2) Male members are 5 years older than their dependants and female members are the same age as their dependants.
3) No allowance is made for the remarriage of widows and widowers.

4) An allowance for children's pensions is made via a loading of 10% to the liability for spouses' pensions on death before retirement.

Re-entry to active service

The 2016 valuation allowed for deferred members to re-enter active service in future by applying a loading of 0.5% pa to the revaluation in deferment assumption. There is insufficient data to analyse the experience but this does not seem an unreasonable allowance, as our understanding is that many teachers do re-enter service and are entitled to opt for final salary linkage on their former deferred benefits (which may generate additional liabilities). We have therefore retained the assumption used for the 2016 valuation.

Appendix 8: Summary of assumptions

Financial assumptions

Discount rate	5.75% p.a.
UK RPI inflation	3.2% p.a. (i.e. UK gilt market break-even inflation less 0.2% p.a.)
Jersey RPI inflation	2.95% p.a. (i.e. UK RPI inflation less 0.25% p.a.)
Rate of deferred pension increases	3.45% p.a. (i.e. Jersey RPI inflation plus 0.5% p.a. as an allowance for future re-entry into active service)
Rate of pension increases in payment	2.95% p.a. (i.e. Jersey RPI inflation)
Rate of salary increases	3.95% p.a. (i.e. 1.0% p.a. above Jersey RPI Inflation) plus an allowance for promotional increases
Expenses (other than investment related expenses)	1.2% of members' salaries

Demographic assumptions

Pre-retirement mortality	Allowance is made for death in service (see sample rates in Appendix 7)
Post-retirement mortality	SAPS S3 "All lives" tables (S3PMA for males and S3PFA for females) with 95% scaling factor allowing for year of birth. Improvements from 2013 in line with the CMI_2018 Projections, with S_K=7, A=0.5 and a long-term rate of future improvements in mortality of 1.5% p.a.
Withdrawals	Allowance is made for withdrawals from service (see sample rates in Appendix 7)
Retirement age	Allowance has been made for active members to retire before Normal Retirement Age in normal health and in ill-health (see tables in Appendix 7). Deferred members are assumed to retire at the earliest age at which they can retire with unreduced benefits.
Commutation	New Members are assumed to commute 22% of their pension on retirement.
Family details	▪ 85% of males and 70% of females are assumed to be married, or have a dependant, at age 65 (or earlier death), reducing thereafter in line with spouse's mortality rates ▪ Male members are assumed to be 5 years older than their dependants and female members are assumed to be the same age as their dependants ▪ No allowance made for remarriage of widows and widowers ▪ 10% loading to spouses' pensions on death before retirement to allow for children's pensions

Appendix 9: Discontinuance test

The discontinuance funding ratio at 31 December 2018 is 101%.

Even though the Orders governing the Fund do not envisage the Fund's discontinuance (i.e. the future accrual of benefits and payment of contributions into the Fund being discontinued), it is our practice at valuations also to review what the financial position of the Fund would have been had discontinuance occurred on the valuation date. This is done by comparing the value of the basic accrued benefits as at 31 December 2018 with the value of the Fund's existing assets at that date.

By basic accrued benefits we mean:

a) benefits in respect of current pensioners and their spouses and dependants;

b) retirement and death benefits in respect of former employees entitled to deferred pensions;

c) accrued retirement and death benefits in respect of current members based on pensionable pay at 31 December 2018, no allowance being made for pay increases after that date.

We have taken the value of the basic accrued benefits on discontinuance at the valuation date as an estimate of the terms that might be offered by insurance companies for determining the cost of immediate and deferred annuities, plus a provision to cover expenses.

In practice, if the Fund were ever to be discontinued, it is possible that the Fund would continue as a closed fund.

Derivation of assumptions

In setting the assumptions for the discontinuance test we have taken into account actual buy-out terms available in the market at the valuation date. However, we have not carried out a detailed analysis of the cost of risks that might apply specifically to the Fund and so our estimate is only a guide. Market changes to both interest rates, and demand and supply for this type of business, mean that no reliable estimate can be made, and that ultimately the actual true position can only be established by completing a buy-out.

We have set the **discount rate** for this estimate equal to Aon's Bulk Annuity Market Monitor curves for pensioners and future pensioners.

The allowance we have made for expenses is separate.

The Orders governing the Fund provide for annual increases in line with the Jersey RPI at present, although lower increases may be paid where an actuarial review has disclosed that the financial condition of the Fund is no longer satisfactory. We have assumed that in a discontinuance situation the pension increases provided would be equal to the minimum increases specified in the Orders, i.e. nil increases.

Expenses

The reserve for expenses allows for deductions to allow for the cost of forced sales of equity, bond and property holdings, an allowance for the management expenses associated with winding up the Fund, and an estimate of the per member charges expected to be levied by an insurance company on buy-out.

For the purposes of disclosure in the valuation, assets are taken at their audited market value. The above allowances for expenses are therefore all presented as additions to the liabilities.

Discontinuance test results

We have considered the discontinuance position on the assumption that in the event of the Fund's discontinuance the capitalised value of the pension increase debt would be paid off in full by the Government of Jersey at that point or over a period of time. This is consistent with the Government of Jersey having publicly recognised a provision within its annual accounts for the debt to be settled in full, even though the mechanics of the debt repayment mechanism have not yet been formally agreed.

The results of the hypothetical discontinuance valuation are as follows:

	£M
Market value of assets	516.4
Value of pension increase debt	120.1
Total value of assets	636.5
Cost of buying-out benefits (including expenses)	630.1
Discontinuance funding ratio (value of assets / value of accrued benefits)	101%

Summary of assumptions

The table below shows the main assumptions underlying the discontinuance test, where these are different from those used for the main valuation basis.

Pensioner discount rate	Aon's Bulk Annuity Market Monitor curves for pensioners
Non-pensioner discount rate (before and after retirement)	Aon's Bulk Annuity Market Monitor curves for non-pensioners
Increase in UK RPI	Term-dependent rates derived from the RPI swap markets
Pension increases in payment and deferred pension increases	Nil
Withdrawals	All members assumed to immediately withdraw from service with entitlement to deferred pension
Commutation	No allowance
Post-retirement mortality	As for the main valuation basis except the long-term rate of future improvements in mortality is 1.75% p.a.

Comparison with discontinuance funding ratio at previous valuation

The discontinuance funding ratio at the 2016 valuation was 95%.

Glossary

Discount rate

This is used to place a present value on a future payment. A 'risk-free' discount rate is usually derived from the investment return achievable by investing in government gilt-edged stock. A discount rate higher than the 'risk-free' rate is often used to allow for some of the extra investment return that is expected by investing in assets other than gilts.

Funding ratio

This is the ratio of the resources of the Fund (its assets, plus the value of the future pension increase debt repayments) to the resources that would be required to meet the **funding target**.

Funding target

This is that, based on best estimate assumptions, the assets and future contributions should be sufficient over the long term to support the benefits payable from the Fund in respect of the current members of the Fund. The resources of the Fund required to meet the **funding target** are determined by assessing the **present value** of the benefits that will be paid from the Fund in the future, based on pensionable service prior to the valuation date, plus the extent to which the **present value** of future service benefits for current members exceeds the **present value** of anticipated future service contributions for such members.

Present value

Actuarial valuations involve projections of pay, pensions and other benefits into the future. To express the value of the projected benefits in terms of a cash amount at the valuation date, the projected amounts are discounted back to the valuation date by a discount rate. This value is known as the present value. For example, if the discount rate was 6% a year and if we had to pay a lump sum of £1,060 in one year's time the present value would be £1,000.