CAMBRIDGE UNIVERSITY ASSISTANTS' CONTRIBUTORY PENSION SCHEME

Actuarial Valuation as at 31 July 2018

Scheme Funding Report

Prepared for C U Pension Trustee Limited

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30 April 2019

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1. EXECUTIVE SUMMARY

1.1 Introduction

This report sets out the results of the actuarial valuation of the Cambridge University Assistants' Contributory Pension Scheme ("the Scheme") as at 31 July 2018.

1.2 Prudence and Covenant

At the last valuation the Trustee rated the Employer Covenant as Strong and this was reflected in the level of prudence factored into the assumptions used. Recently, the University has agreed to provide the Trustee with a negative pledge in respect of the University's assets. The Trustee has advised me that it considers that the Employer Covenant continues to be Strong, and this is reflected in the level of prudence incorporated into the assumptions used for the valuation.

1.3 Current Funding Level

The Scheme's funding level on the Statutory Funding Objective at the valuation date was 95%, equivalent to a deficit of £34.6 million. At the previous valuation as at 31 July 2015 the ongoing funding level was 98%. The main reasons for the deterioration are changes in the valuation basis, particularly a lower discount rate, partly offset by better than assumed investment returns, the impact of the deficit reduction contributions paid by the Employers and other experience gains.

1.4 Future service cost and deficit funding contributions

The ongoing overall joint contribution rate for future service benefits, ignoring the past service position, is 12.2% of Pensionable Salaries. The split of this rate is shown below; for comparison, the current rates at which contributions are being made are shown in brackets.

	Salary Sacrifice Members		Non Salary Sacrifice Members	
	Active Members %	Employers %	Active Members %	Employers %
Pre-2013 Members paying additional contributions under Rule 45.6	Nil	21.2 (20.0)	8.5	12.7 (11.5)
Other Pre-2013 Members	Nil	17.7 (16.5)	5.0	12.7 (11.5)
Post-2013 Members	Nil	8.2 (8.8)	3.0	5.2 (5.8)

The current rates at which contributions are being paid equate to an overall joint contribution rate of 12.0% of Pensionable Salaries.

The main reasons for the slight increase are an increase in the average age of the pre-2013 membership, offset by an increase in the proportion of the total membership comprising post-2013 members.

These rates include allowances for expenses, levies and the cost of providing death in service benefits.

The Trustee and the University have agreed that Employer contributions should continue at the current rates. The Trustee and the University have also agreed that the Employer will continue to pay additional contributions of £14,595,000 p.a. from 1 August 2018 to 31 July 2020, which will eliminate the funding shortfall.

1.5 Solvency position

The solvency position of the Scheme has been measured by reference to the estimated cost of buying out the benefits with an insurance company. As at the valuation date the solvency funding level of the Scheme was 41%.

If the Scheme was fully funded on the Statutory Funding Objective the solvency funding level would be 43%.

1.6 PPF Section 179 position

The PPF Section 179 position of the Scheme has been measured in line with the prescribed assumptions and benefits as laid down by the PPF Board. At the valuation date the Section 179 funding position was 59%.

This funding level is used by the PPF Board to help it determine the risk based portion of the PPF levy.

1.7 CETVs

I recommend that the CETV basis be reviewed following completion of this valuation to ensure continuing consistency with the final agreed Scheme Funding basis.

1.8 Factors

The Scheme's commutation factors and other administrative factors should be reviewed following the valuation to reflect changing economic and demographic conditions.

1.9 Timescale and future valuation requirements

The next triennial valuation is due to take place as at 31 July 2021. As this Scheme has more than 100 members, interim actuarial reports will be required as at 31 July 2019 and 31 July 2020.

As this Scheme has a Recovery Plan, a summary of this valuation report plus copies of the Recovery Plan and Schedule of Contributions needs to be sent to TPR within 10 working days of this report being signed.

Finally a Summary Funding Statement should then be sent to members updating them on the Scheme's funding position. This should be issued no later than 31 January 2020.

2. INTRODUCTION

2.1 Background

This report on the actuarial valuation of the Cambridge University Assistants' Contributory Pension Scheme ("the Scheme"), as at 31 July 2018, was commissioned by and is addressed to the Trustee of the Scheme. It has been prepared under Rule 23 of the Ordinances & Rules and Section 224 of the Pensions Act 2004. These state that the Trustee is required to obtain an actuarial valuation at least every three years and actuarial reports in intervening years.

2.2 Purposes

The purposes of the valuation are:

- to review the Scheme's funding position relative to its funding target;
- to determine contribution rates for funding Scheme benefits;
- to assess the Scheme's solvency position; and
- to satisfy statutory requirements.

2.3 Previous valuations

The Scheme was last valued as at 31 July 2015 and the results were contained in my report dated 26 February 2016.

2.4 Inter-valuation review

The previous valuation recommended joint contributions to the Scheme to fund future benefit accrual as follows:

	Salary Sacrifice Members		Non Salary Sacrifice Members	
	Active Members %	Employers %	Active Members %	Employers %
Pre-2013 Members paying additional contributions under Rule 45.6	Nil	21.4	8.5	12.9
Other Pre-2013 Members	Nil	17.9	5.0	12.9
Post-2013 Members	Nil	8.7	3.0	5.7

However, the Trustee and the Employers agreed to maintain the following rates (put in place following the 2012 valuation) subject to the ongoing payment of the deficit reduction contributions, detailed below:

	Salary Sacrifice Members		Non Salary Sacrifice Members	
	Active Members	Employers	Active Members	Employers
	%	%	%	%
Pre-2013 Members paying additional contributions under Rule 45.6	Nil	20.0	8.5	11.5
Other Pre-2013 Members	Nil	16.5	5.0	11.5
Post-2013 Members	Nil	8.8	3.0	5.8

In respect of the shortfall in funding, the Employers agreed to continue to pay additional contributions of £14,595,000 p.a. from 1 August 2015 to 31 January 2019.

Contributions have been paid in accordance with the Rules of the Scheme and these recommendations.

2.5 References for earlier advice on this valuation

An earlier document, the Memorandum on the actuarial valuation dated 20 November 2017, set out my initial advice to the Trustee regarding the commencement of the valuation process and the purpose of this process. It included drawing the Trustee's attention to the different funding methods that are available to them and how they may choose a set of assumptions. Setting the method and basis is the Trustee's responsibility but they should first take my advice.

The Trustee commissioned an additional Scheme Experience Report, dated 22 February 2018, in which I set out updated assumption recommendations based on recent Scheme experience.

It should be noted that I have not provided any advice to the Trustee on Employer matters. In particular in recommending assumptions to the Trustee I provided no advice on factors affecting the Employers or their industry which may affect such factors as pay increases or rates of withdrawal of Scheme membership. In calculating the contribution rates I have not provided any advice on other related Employer matters such as business plans, expenditure commitments or industry reports.

Initial results of the funding valuation were addressed to the Trustee and were set out in my Summary of Initial Results report dated 13 November 2018. My subsequent letter dated 21 February 2019 set out an alternative basis and results.

The above advice was reviewed by the Trustee, and following discussion with the Employers, the agreed assumptions to be used are set out in Appendix E.

2.6 Third party Statement

The calculations in the report use methods and bases appropriate for the purpose described above. Figures required for other purposes, such as Employer accounting, should be calculated in accordance with the specific requirements for such purposes and it should not be assumed that the figures contained in this report are appropriate. The report may be provided to the Employers and to Scheme members in accordance with the disclosure legislation and regulations, but may only be disclosed to other parties with our consent. The report does not grant any rights to Scheme members or other third parties and may not necessarily cover all the implications for a third party. I and Cartwright Group Ltd do not accept any liability to any third parties in respect of the contents of this report.

2.7 Reporting requirements

This report, when read in conjunction with the reference material set out above, is compliant with the following Technical Actuarial Standards (TAS) issued by the Financial Reporting Council:

- TAS 100 – Principles for Technical Actuarial Work; and
- TAS 300 – Pensions.

The calculations undertaken to produce this report have complied with the above TAS.

The actuarial information contained in this report has been peer reviewed in accordance with Actuarial Profession Standards (APS) X2 – Review of Actuarial Work.

3. BACKGROUND

3.1 The Scheme

The Scheme is deemed to be a registered pension scheme under the terms of Schedule 36 of the Finance Act 2004.

The Scheme is open to existing members and future new entrants and members of the Scheme continue to accrue benefits.

3.2 Core benefits under Rules

We have valued the Scheme benefits set out in Ordinances and Rules of the Scheme. References to Pensionable Salary in this report have the same meaning ascribed to them as in the above documents. A summary of the benefits valued is set out in Appendix C, although it should be borne in mind that in the event of any discrepancy between this summary and the Rules, the Rules will prevail.

Members may pay Additional Voluntary Contributions (AVCs) to increase benefits payable from the Scheme. Liabilities and assets shown in this report exclude money purchase AVCs but do include AVCs used to provide additional service credits.

3.3 Allowance for discretionary benefits

The Scheme Rules allow discretionary benefits to be provided to members.

In recent years this option has not been exercised, and therefore no discretionary benefits have been granted. As such the valuation does not allow for any discretionary benefits and assumes that any which are granted will be funded at the time.

3.4 Allowance for insured benefits

The Trustee does not insure death in service benefits.

A very small minority of the pensions in payment are partly insured with an insurance company. These have been excluded from the funding valuation as they are exactly matched by an insurance policy. As required by legislation, we have allowed for them in the PPF Section 179 valuation.

3.5 Allowance for member options

Allowance has been made for members retiring earlier than Normal Pension Age, using assumptions based on actual Scheme experience.

No allowance has been made for other member options which, if chosen, could reduce or increase the overall Scheme technical provisions.

3.6 Allowance for GMP equalisation

Because the Scheme was contracted-out of the State Earnings-Related Pension Scheme (SERPS) beween1990 and 1997, the benefits for individuals who were members of the Scheme between these dates include a "Guaranteed Minimum Pension" (GMP). In broad terms, this replicates the pension that the member would otherwise have earned under SERPS. Reflecting the structure of the State Pension Scheme at that time, GMPs accrued at different rates for men and women and are payable at different ages (65 for men, 60 for women).

In general, occupational pension schemes have had to provide equal benefits for men and women since the "Barber" case on 17 May 1990. However, because GMPs replicate State benefits (which were exempt from the Barber judgment) there has been considerable uncertainty as to whether this equalisation requirement extends to GMPs. As a result, the vast majority of occupational pension schemes have not yet taken any action on GMP equalisation.

The calculations undertaken for this Summary exclude any allowance for the impact which GMP equalisation may have on members' benefits and hence Scheme funding. However (see Section 3.12) as a result of a recent High Court case, it may now be appropriate to take this into account.

3.7 Scheme changes since previous valuation

There have been no changes to the Scheme's benefits since the previous valuation.

3.8 Legislative changes since previous valuation

There have been no recent legislative changes since the previous valuation that have materially impacted on Scheme benefits or Scheme funding.

3.9 Membership data

The data for the valuation was provided by the Pensions Office on behalf of the Trustee. Whilst we have taken reasonable steps to satisfy ourselves that the data provided is of adequate quality for the purposes of the valuation, ultimately we have relied on the accuracy of the information provided. The membership data covered details of 4,902 active members, 4,033 deferred pensioners, 334 pending members and 3,186 pensioners. A more detailed summary is provided in Appendix A of this report.

We carried out the following data checks:

- Comparison and reconciliation with previous valuation data;
- Missing data and consistency checks;
- Checking Pensionable Salaries against previous data and for reasonableness;
- Checking Final Pensionable Salaries against previous data and for reasonableness;
- Checking part time member data; and
- Checking deferred pensions and pensions in payment against previous data.

We are grateful to the Pensions Office for their assistance in answering our queries.

3.10 Asset data

The audited Scheme accounts show that the market value of the Scheme's assets at 31 July 2018 amounted to £708,067,536. This includes assets in relation to members' added years AVCs but excludes money purchase assets and insured pensions. Appendix B provides a more detailed breakdown of the Scheme's assets.

3.11 Employer matters

We have not provided any advice to the Trustee in connection with the Employers.

3.12 Material post valuation date events

On 26 October 2018 the High Court announced its decision in the Lloyds Bank GMP equalisation case. This confirms that GMPs should be equalised from the Barber judgment date, 17 May 1990.

It is far too soon for the Trustee to have reviewed the impact of this on the Scheme. In particular, there are still questions to be answered around how the equalisation should be applied in practice, and it is expected that the DWP will be issuing further guidance on this matter.

Typical estimates of the impact of GMP equalisation on the value placed on a scheme's liabilities are that it increases the value of liabilities by around 1%-3%. However, due to the particular factors which apply in this Scheme (GMPs increase both in deferment and payment at the same rate as non-GMPs) we would expect the increase for this Scheme to be at the bottom of this range, possibly even lower.

We have not made any allowance for GMP equalisation in this valuation. The Board of the Pension Protection Fund have confirmed that this is a reasonable approach to take for PPF Section 179 purposes for Schemes with a valuation date prior to 26 October 2018.

We are not aware of any other material events that have occurred after the valuation date which would affect the results set out in this report.

4. FUNDING PRINCIPLES

4.1 Statutory funding objective

The Statutory Funding Objective is set out in the Statement of Funding Principles dated 30 April 2019 included as Appendix D to this report.

Under Rule 44 of the Rules, each Employer must pay contributions at rates decided by the University as Principal Employer, after taking actuarial advice. However, this is overridden by the Pensions Act 2004, under which the Principal Employer and Trustee jointly agree to the Statement of Funding Principles and the contribution rates payable to the Scheme.

4.2 Agreed funding target

The agreed funding target for the Scheme is the Technical Provisions. I would stress that achieving this target may mean that other targets may still not be met. In particular, in current market conditions if the Scheme were to be 100% funded on the Technical Provision, it would only be 43% funded on the Solvency target, i.e. Technical Provisions are not the same as wind up costs. Unless further funds were to be available, on a winding-up of the Scheme it would not be possible to secure members' benefits in full.

4.3 Funding objectives

Based on the Technical Provisions as a funding target, the currently agreed funding objectives are as follows:

- to assume that the Scheme will invest predominantly in return seeking assets, and overall credit should be taken for a real long term investment return of up to 4% per annum
- subject to the above, to adopt a set of assumptions which is prudent;
- not to make any allowance for any mis-matching of assets and liabilities;
- not to make any allowance for discretionary benefit increases;
- to eliminate any deficit relative to the funding target by increases in the rate of contributions over a period that does not exceed 16 years; and
- in terms of overall prudence, the Trustee takes into account its assessment of the strength of the covenant of the Employers, the risks inherent in the Scheme's investment strategy and the Scheme's solvency position.

4.4 Changes to funding objectives

Since the previous valuation, the Trustee has added an objective related to the strength of the Employers' Covenant.

4.5 Funding implications on stability of contribution rate

The funding objective includes allowance for investment in equity type assets, and makes no allowance for the mis-matching of assets and liabilities. Since the returns on equities can be volatile over even relatively short periods of time, this means that the contribution rate will be less stable than would apply were these factors not included.

4.6 Funding implications for paying CETVs in full

The funding objective adopted is such that if the Scheme meets its objective there will be more than sufficient assets to pay unreduced transfer values.

5. VALUATION METHOD AND ASSUMPTIONS

5.1 Funding method

The cost of the future benefit accrual within the Scheme has been determined in this valuation using the Projected Unit funding method with a four year and nine months Control Period. This Control Period will reduce to one year at future triennial valuations. The Control Period was original introduced to help smooth future service contribution rates following the introduction of the new benefits structure on 1 January 2013.

Under this method, the capital value of the benefits accruing over the four years following the valuation date, based on members' Pensionable Salaries projected to the date of their retirement, death or earlier exit, is expressed as a percentage of the total current Pensionable Salaries, to give the future service contribution rate.

This method will result in a relatively stable future service contribution rate provided the profile of the active membership, by age, sex and salary, does not change significantly between Actuarial valuations. There is therefore an implicit assumption that there are new entrants to the Scheme. If there are not any new entrants to the Scheme the future service contribution rate will be expected to rise as the active membership ages.

5.2 Previous funding method

The same funding method was used for the previous actuarial valuation.

5.3 Factors to consider in choosing funding method

Under the Code, the Trustee is required to consider the following factors (inter alia) when choosing a funding method:

- the ability and willingness of the Employers to make advance provision for future events; and
- the likely number of new entrants to the Scheme in future.

We have not provided any advice to the Trustee in connection with these factors. The Trustee will need to be satisfied that the chosen funding method is appropriate bearing in mind the above factors.

The past service funding position is calculated by comparing the value placed on the existing Scheme assets with the value placed on members' benefits accrued before the valuation date allowing for future Pensionable Salary increases to retirement, death or earlier exit. Any deficiency is expressed as an increase in the contribution rate payable for a stated period.

5.4 Valuation assumptions

The valuation assumptions are given in Appendix E. Details of how they were derived are set out in the Trustee's Statement of Funding Principles included in Appendix D.

Note that the Trustee has considered each assumption individually. They have not adjusted any assumption as a proxy to compensate for shortfalls in another assumption.

5.5 Assets

As for the previous valuation, we have used a market-related basis to value both the assets and liabilities of the Scheme. Assets are included at their market value, whilst liabilities are valued using financial assumptions based on the yields implied by these market values. This does lead to a degree of volatility in the valuation results from one valuation to the next but I believe it ensures that a compatible and consistent approach is adopted to valuing both assets and liabilities, and that it will provide a more appropriate estimate of the cost of the Scheme benefits in current market conditions.

5.6 Recovery Plan

The Statement of Funding Principles describes a Recovery Plan for removing any funding deficit. The Recovery Plan requires the deficit to be removed by fixed additional contributions payable over 1 year and 10 months.

Under the Code the Trustee should aim for any shortfall to be eliminated as quickly as the Employers can reasonably afford. What is possible and reasonable, however, will depend on the Trustee's assessment of the Employers' covenant.

When considering the structure of the Recovery Plan and the contribution required, the Trustee should take into account the following matters:

- the Employers' business plans and the likely effect any potential recovery plan would have on the future viability of the Employers;
- the Scheme's membership profile. A longer recovery period may be more appropriate in a scheme where most members have many years to go before retirement than in one where the vast majority are already receiving pensions.
- the ability of the Trustee to pursue an Employers to make good a deficiency in the event of a scheme wind-up.
- the Employers' expenditure commitments.
- the value of any contingent security provided by the Employers bearing in mind both the term and enforceability.
- whether there are any impending member movements which would have a potentially significant effect on funding, such as major retirements or bulk transfer (in or out);
- the anticipated level of the risk-based element of the Pension Protection Fund levy, year on year, over the course of the recovery period and how this is met by the Employers;

We have not provided any advice to the Trustee in connection with the above factors. The Trustee has considered these factors before determining the appropriate period over which the deficit should be paid.

6. FUNDING VALUATION RESULTS

6.1 Results

The following Section summarises the results of the valuation on the Scheme's funding objective using the basis described in Section 5 and Appendix E.

6.2 Past service position/technical provisions

Value of benefits in respect of service on or before 31 July 2018:		£000's
Active Members		250,866
Deferred Pensioners & Pending Members		181,076
Current Pensioners		303,375
Expenses		7,353
Technical Provisions	(A)	742,670
Market Value of Scheme Assets	(B)	708,068
Past Service Surplus/(Deficit)	(B-A)	(34,602)
Level of Funding of Past Service Benefit	(B/A)	95%

The appropriate actuarial certification of the Scheme's Technical Provisions is included as Appendix F to this report.

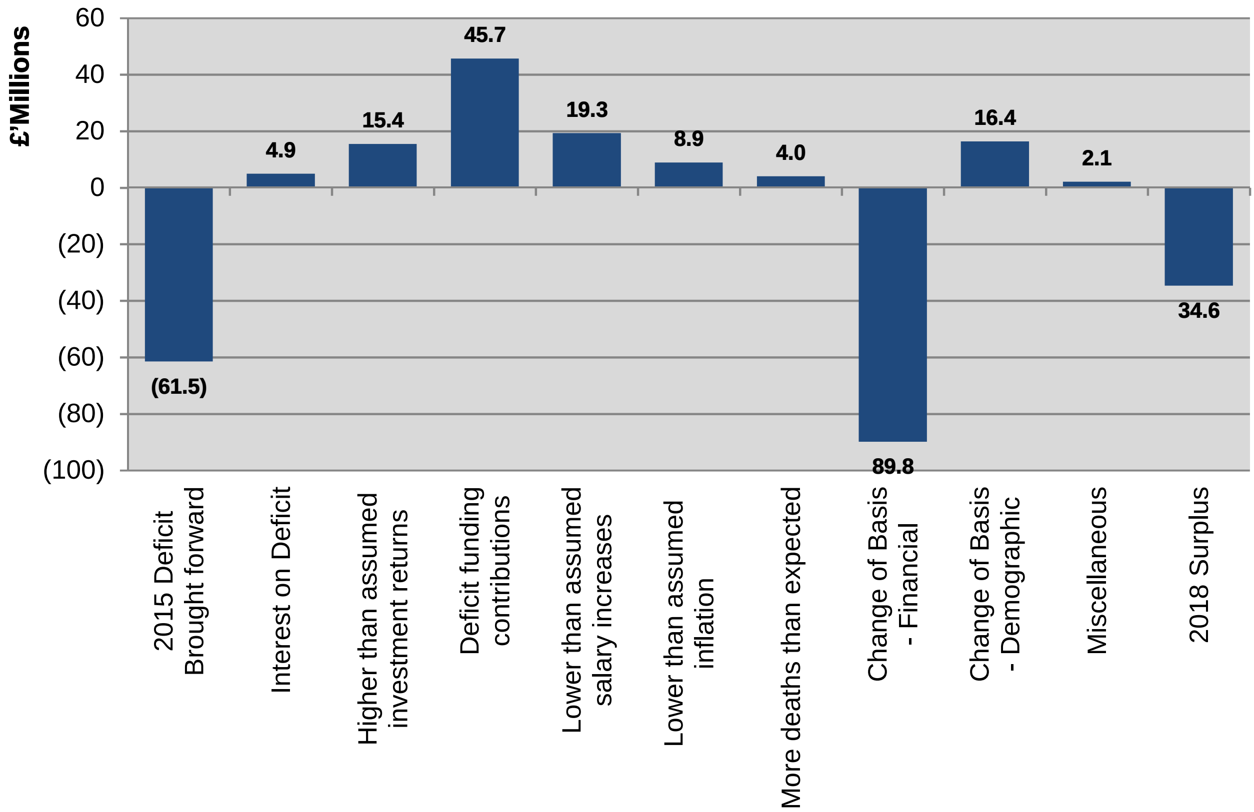
The Trustee and the Employers should be aware that the Technical Provisions are not the same as the cost of winding up the Scheme. This is shown in Section 9 of the report.

The past service deficit of £34,602,000 compares to the deficit disclosed by the previous valuation of £61,484,000. An approximate analysis of the principal factors affecting the level of deficit since the previous valuation is given below.

The miscellaneous item in the analysis includes, for example, the effects of variations over the inter-valuation period between actual experience and the assumptions made for withdrawals, retirements, transfers out and expenses used in the previous valuation. We would be pleased to analyse this item further, if required.

	£000's
Surplus/(Deficit) as at 31 July 2015	(61,484)
Assumed asset return less interest on liabilities	4,941
Deficit contributions paid	45,690
Expected Surplus/(Deficit) as at 31 July 2018	(10,853)
Investment returns higher than assumed	15,458
Salary increases lower than assumed	19,278
Pension increases lower than assumed in deferment and payment	8,928
Experience gains from deaths over the period	4,000
Changes in financial assumptions	(89,833)
Changes in demographic assumptions	16,363
Miscellaneous	2,057
Actual Surplus/(Deficit) as at 31 July 2018	(34,602)

Analysis of experience



6.3 Significant variations

The most significant variations in the analysis are as a result of:

- Changes in the valuation basis, mainly as a result of changes in the discount rate and in the mortality assumptions;
- Investment returns were higher than assumed over the 3 year period; and
- Inflation and salary increases were lower than assumed.

6.4 Future service cost

The total contribution rate is made up of two parts; the cost of the future benefit accrual and the contribution to remove the past service deficit shown above. The rates shown do not include any allowance for members' AVCs.

These rates are based on a control period of 4 years 9 months, consistent with the 7 years and 9 months adopted at the previous valuation. This approach is adopted to ensure a smooth transition of future service contribution rates over the period since the benefit structure was amended.

The overall joint contribution rate to fund future benefit accrual is 12.2% of Pensionable Salaries. This includes allowances for members' contributions, the cost of self-insuring the death in service benefit and for the expenses of running the Scheme. The breakdown of this rate is shown below, along with the existing rates of contribution in brackets for comparison:

	Salary Sacrifice Members		Non Salary Sacrifice Members	
	Active Members %	Employers %	Active Members %	Employers %
Pre-2013 Members paying additional contributions under Rule 45.6	Nil	21.2 (20.0)	8.5	12.7 (11.5)
Other Pre-2013 Members	Nil	17.7 (16.5)	5.0	12.7 (11.5)
Post-2013 Members	Nil	8.2 (8.8)	3.0	5.2 (5.8)

The current overall joint contribution rate is 12.0% of Pensionable Salaries. The slight increase to 12.2% in the contribution rates are mainly due to an increase in the average age of the pre-2013 membership and a slightly lower discount rate assumption. This is offset by an increase in the proportion of the total membership comprising post-2013 members.

The Trustees and the University have agreed that the Employer contributions should continue at the current rates.

6.5 Deficit funding contributions

The Scheme has a funding deficit at the valuation date on the Technical Provisions basis. The Trustee has agreed with the University that the additional contributions of £14,595,000 per annum, payable monthly, currently paid by the Employers will continue to 31 July 2020, which will eliminate the shortfall.

6.6 Expenses

I have reviewed the allowances for the ongoing expenses of the Scheme and compared them to recent actual experience. Over the past 3 years the ongoing expenses, excluding investment related expenses, have averaged just under 1.0%pa of Pensionable Salaries. The ongoing Administrative expenses, excluding PPF related expenses, have been reducing as a percentage of Pensionable Salaries however, the PPF levies have been increasing and have more than offset the reduction in other expenses.

The current allowances for expenses are 0.9%pa of Pensionable Salaries plus 1% of the Technical Provisions. I propose that these are retained until at least the outcome of the next valuation is known.

6.7 Future progression and material developments

Assuming that all funding assumptions in Appendix E are borne out in practice and that contributions are paid as described above, then I expect the funding level to improve to 100% by the next valuation.

I am not aware of any material developments that would significantly affect funding over the next 3 years.

6.8 Further issues: CETVs

The Scheme has a funding surplus so Cash Equivalent Transfer Values (CETVs) should continue to be paid in full.

I recommend that the CETV basis be reviewed following completion of this valuation.

6.9 Scheme factors

The actuarial factors used in individual member calculations are due for review following the valuation to reflect the changes in economic and demographic conditions since the last valuation.

7. FUNDING RISKS AND SENSITIVITIES

7.1 Funding Risks

There are risks inherent with any funding objective, even if the funding target is met, and the following risks should be appreciated and where possible mitigated.

7.2 Sponsor risk

If the Employers become insolvent or are are otherwise unable to meet the contribution rate set then the risk is that members may not receive all benefits they expect. The Trustee takes a prudent approach to funding to mitigate this risk to some extent.

7.3 Investment return

If the assets under-perform the returns assumed in setting the funding target then additional contributions may be required at subsequent valuations.

7.4 Investment matching risk

The Scheme invests significantly in equity type assets, whereas the solvency target is closely related to the return on bonds. If the Scheme were to wind-up when these equity type assets have fallen in value relative to the matching assets of bonds, members may not receive their full expected benefits. If the Scheme were not to wind-up, additional contributions may be required.

7.5 Longevity risk

If future improvements in mortality exceed the assumptions made then additional contributions may be required. The Trustee have taken a prudent approach to possible future improvements in longevity to help mitigate this risk.

7.6 Solvency risk

As the funding target is not a solvency target, and the investment strategy does not follow that required for a solvency target, the assets of the Scheme may not be sufficient to provide all members with the full value of their benefits on a Scheme wind-up.

7.7 Inflation risk

Most Scheme benefits are linked to inflation (RPI/CPI). If actual inflation is higher than expected or if future inflation expectation increases then additional contributions may be required at subsequent valuations.

7.8 Concentration of assets

If the Scheme invests a significant proportion of its assets in one class of investments for example UK equities, or in one specific investment it is exposed to an increased risk from falls in that investment.

This may reduce the level of funding and require additional contributions to correct. The Trustee has no such investment.

7.9 Self-investment risk

If the Scheme invests in the Employers in any form it is at risk that the value of this investment will fall if the Employers perform badly. This will coincide with the time the Employers are least able to make additional contributions to correct the situation. The Trustee does not invest in the Employers to help avoid this risk.

7.10 Member option risk

If members of the Scheme exercise options allowed by the Scheme on a scale which is sufficient to lead to an increase in costs, the Scheme funding position may worsen. Members who joined prior to 1 December 2009 have the right to retire at age 60. If all members chose to do so then costs would increase above those assumed. The Trustee investigates Scheme experience regularly to check on such trends.

7.11 Climate-related risks

The world's climate is changing and this poses risks to the provision of benefits for members. These could arise from:

- Physical risks – the risks arising from potential degradation to physical assets; e.g. property damage, disruption of resource availability, due to extreme weather events such as flooding and in the longer-term from changes to rainfall patterns affecting land use and the movement of populations reducing local workforce availability.
- Transition risks – depending on the nature and speed of mitigation and adaptation policies and requirements by governments and regulators related to climate change, transition risks may pose varying levels of financial and reputational risk to pension funds from the potentially rapid reduction in the market value of, or income generated by, assets.
- Liability impacts – extreme hot or cold weather might impact death rates, whereas generally warmer winters might improve life expectancy and so longevity improvement trends.

Investment management is delegated to managers who will be aware of this risk in their portfolio construction. It is difficult to predict the impact on life expectancy for members largely based in the UK. Furthermore, the Trustee should consider the extent to which climate change may impact businesses (and so employer covenants).

It is difficult to quantify any specific impact at this point in time – the Trustee should keep this under review as more evidence develops.

7.12 Summary

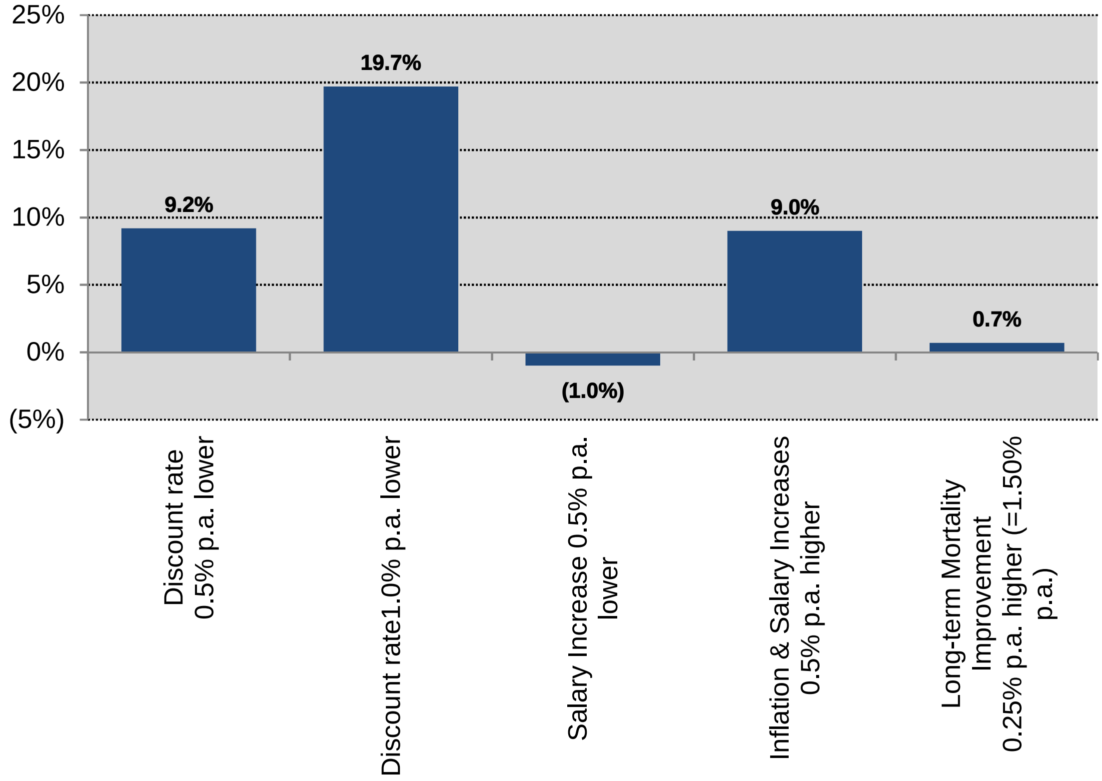
The above list is not exhaustive but covers the main risks for the Scheme. Some of the risks can be reduced by adjusting the funding strategy, for example investment matching risk. Other risks cannot be removed, for example longevity risk, and the Trustee must be aware of these risks and monitor them closely.

7.13 Sensitivities

The risks discussed above can have a significant impact on the results of the valuation. For example, the financial assumptions that have the most significant effect on the results of the valuation relate to the investment return, the rate of increase in Pensionable Salaries and the rates of increase of pensions in payment or deferment. In addition, improving longevity can also result in increased Scheme liabilities.

The chart below shows the approximate percentage increase in the Scheme's funding objective liabilities if each of the financial assumptions was changed by the amount specified. The figures shown are for a guide only as the effects of changing the assumptions are interdependent.

Sensitivity Analysis



The chart shows that the real investment return assumption (i.e. the assumption for investment return in excess of inflation) has the greatest impact on the size of the Scheme's liabilities. Therefore the Scheme's funding position is likely to deteriorate significantly if the Scheme's assets do not attain the real investment return assumed.

We have also undertaken a 'neutral' valuation with the following margins removed from the assumptions:

- 1.5% from the investment return;
- 0.5% from the salary growth assumption;
- 7% for males and 5% for females from the base mortality rates; and
- Proportions married set at 75% for males and at 70% for females.

The impact of these changes is to reduce the value of the liabilities by approximately 25%.

8. PENSION PROTECTION FUND – SECTION 179 VALUATION

8.1 Background

The Scheme is required to pay levies to the Pensions Protection Fund (PPF). The PPF provides a minimum level of benefit for members of pension schemes that wind-up in deficit.

In order to assess the appropriate levy the PPF require pension schemes to submit Section 179 valuations at least every three years. The section 179 valuation requires the Scheme Actuary to value the PPF level of benefits using a method and assumptions defined by the PPF board, and detailed on their website.

		£000's
Value of benefits in respect of:		
- Active Members		477,566
- Deferred Pensioners & Pending Members		348,464
- Current pensioners including insured pensioners		345,697
- Expenses of winding up		13,217
- Expenses of benefit installation		11,403
Total Section 179 liabilities	(A)	1,196,347
Market Value of Scheme Assets from accounts		708,068
Value of Insured pensioners		933
Total Market Value of Scheme Assets	(B)	709,001
Section 179 Surplus/(Deficit)	(B-A)	(487,346)
Level of Section 179 Funding	(B/A)	59%

8.2 Additional information

These results have been supplied to the Pensions Regulator and the PPF Board via the Pensions Regulator's online Exchange system. When submitting information on the Exchange the following additional information was included:

- Section 179 guidance used: G8
- Section 179 assumptions used: A8

Percentage of the assets shown above held in the form of a contract of insurance where this is not included in the asset value recorded in the relevant Scheme accounts: 0.1%

The percentage of liabilities shown above that are matched by insured annuity contracts for:

- Active members: 0%
- Deferred members: 0%
- Pensioner members: 0.2%

The proportion of liabilities which relate to each period of service:

	Pre 6 April 1997	6 April 1997 to 5 April 2009(*)	on or after 6 April 2009
Active members	7%	37%	56%
Deferred members	15%	55%	30%
Pensioners	44%	56%	Not applicable

(*) to the valuation date for pensioners.

Number of members and averages ages:

	Number of Members	Average Age
Active members	4,902	49
Deferred pensioners	4,367	47
Pensioners	3,186	70

The average age shown is weighted by PPF liabilities as at the effective date of this valuation, for each member type, and rounded to the nearest whole year.

9. SOLVENCY POSITION

9.1 Solvency

The figures in the previous Sections relate to Scheme funding on the funding objective. We have separately considered the solvency position, assuming that the Scheme was wound-up at the valuation date and members' accrued benefits were secured by the purchase of deferred and immediate annuity policies issued by an insurance company.

9.2 Assumptions

Solvency assumptions are based on recent buy out quotations obtained for other Cartwright clients. The equivalent assumptions for the solvency valuation at the previous valuation were based on the PPF Section 179 assumptions.

	Solvency valuation
Pre-retirement return	1.60%
Post-retirement return	1.80%
RPI inflation	3.45%
CPI inflation	3.25%
Mortality post-retirement	121% of S2NMA pension mortality tables for males and 90% of S2NFA pension mortality tables for females. Plus a projection based upon the CMI_2017 model with a long-term 1.75% p.a. improvement.
Proportion married	85%

9.3 Expenses

We have included an estimate of the expenses associated with organising a wind-up equal to 1% of the value of the liabilities. The true cost of winding-up the Scheme may be higher or lower than this estimate.

9.4 Summary

On this basis the solvency position of the Scheme at the valuation date is shown below:

		Solvency valuation £000's	Previous solvency valuation £000's
Value of benefits in respect of:			
- Active Members		675,518	574,108
- Deferred Pensioners & Pending Members		534,580	346,975
- Current Pensioners		490,346	402,643
- Expenses		17,004	13,237
Total solvency liabilities	(A)	1,717,448	1,336,963
Market Value of Scheme Assets	(B)	708,068	551,094
Solvency Surplus/(Deficit)	(B-A)	(1,009,380)	(785,869)
Level of Solvency Funding	(B/A)%	41%	41%

9.5 Changes since previous valuation

The solvency level has remained at 41% since the previous valuation, however the cash position has deteriorated. This as a result of:

- changes in the solvency basis;
- contributions by the Employers being insufficient to cover the costs of pension accrual on a solvency basis; and
- interest on the solvency deficiency from the previous valuation,

partly offset by good investment returns over the period.

9.6 Debt on Employers

Under current legislation if the Scheme were to be wound-up the deficit on the solvency basis would be imposed as a debt due from the Employers. If the Employers are unable to pay the debt in full, then the liabilities would be met in the order of priority set out in the Scheme's Trust Deed and Rules as overridden by the Pensions Act 1995 and subsequent Regulations.

9.7 Priority order

The cover, on the solvency basis, of the Scheme benefits using the order of priority which would apply as at the date of signature of this report is as follows:

Liability	Cover
Expenses and money purchase benefits	100%
Benefits provided by the Pensions Protection Fund	58%
Benefits in excess of those provided by the Pensions Protection Fund	0%

This table shows that at the valuation date the benefits provided by the Pensions Protection Fund (PPF) were not covered in full. Therefore at this date if the Scheme had wound up without a solvent employer it would have entered the PPF. This would have resulted in members' benefits being reduced below their full entitlements.

9.8 Future progression and material developments

Based upon the assumptions adopted for the solvency calculations, payments of Employer contributions at the rate detailed in Section 11 are projected to be insufficient to fund on the solvency basis. Consequently the above solvency position is expected to deteriorate over the period to the next actuarial valuation.

Employer contributions at the rate detailed in Section 11 are also likely to worsen the level of coverage on the current order of priorities. However in the period to the next valuation the change is unlikely to be significant.

10. INVESTMENT STRATEGY

10.1 Background

The Pensions Act 1995 requires the Trustee to regularly to review the Statement of Investment Principles to ensure that it is consistent and compliant with Section 36 ("Choosing Investments"). We have therefore set out below some comments on the nature of the Scheme's liabilities to assist in this review.

10.2 Asset split

Appendix B provides details of the Scheme's assets at the valuation date. At that time approximately 81% of the assets were invested in equities hedge funds and property assets, which provide unknown future returns. The remainder of the assets were invested in gilts, corporate bonds and cash, which, if held until maturity, provide known returns assuming that there are no defaults.

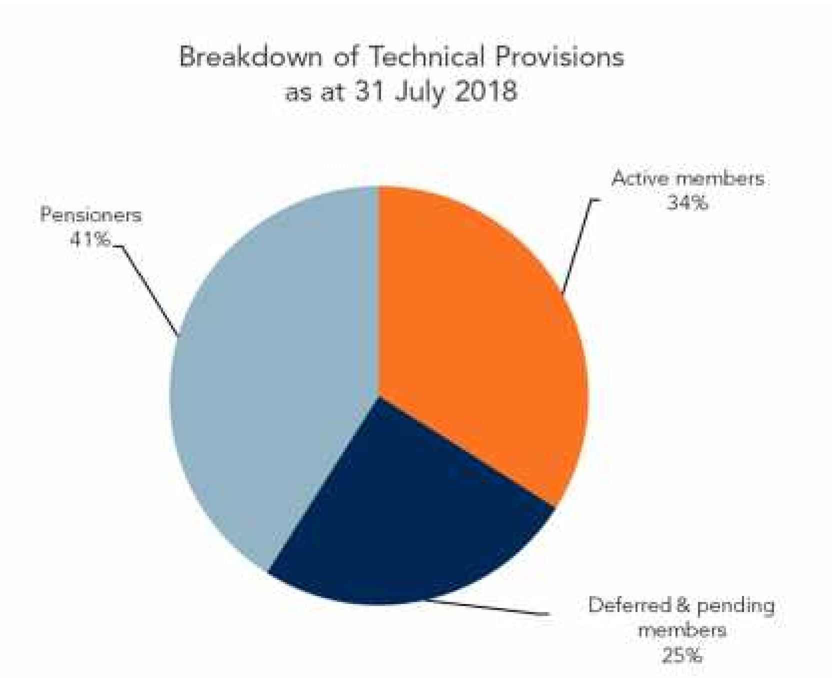
Based on the current investment strategy, the Trustee's investment advisors, Aon Hewitt, have kindly given us their updated best estimate assumptions for future investment returns, which is RPI + 3.4% per annum, i.e. 6.65% per annum.

For the calculation of the Technical Provisions for the 2018 valuation the Trustee has adopted a discount rate of RPI + 1.9% per annum. For the calculation of the future service cost and for the asset return in the Recovery Plan the Trustee has assumed a discount rate of RPI +2.6% per annum.

10.3 Liability split

The chart below shows the breakdown of the Scheme's Technical Provisions by Member Category.

Technical provisions by member category



Equities hedge funds and property assets are typically assumed to provide some level of out-performance, but their returns are volatile. Therefore, any scheme that includes assets of this type and/or uses investment return assumptions allowing for out-performance will experience a more volatile funding level.

In many schemes pensioner members are often backed by the scheme holding gilts and/or bonds because these provide a known return and their values will change in a similar way when interest rates change. The other scheme liabilities are backed by more volatile out-performance assets.

10.4 Comparison

Looking at the chart, the Scheme has a significant proportion (41%) of its liabilities directly related to pensioners. The Scheme assets are only 19.2% invested in bonds and cash and so this will increase the volatility of the funding level as the assets and liabilities will not change value in the same way.

10.5 Recovery Plan

The Trustee has agreed to use a higher rate of return in the calculation of the contributions to be paid under the Recovery Plan. This rate is below the best estimate rate of return as advised by the Trustee's investment consultants.

10.6 Recommendation

There are a number of different funding measures the Scheme can match against in order to reduce risk with respect to the funding measure.

Alternatively, the Trustee might wish to accept a certain degree of mismatching in the expectation of higher investment returns. I understand that the Trustee have reviewed their investment policy and appreciate the risks associated with this element of mismatching.

We have previously undertaken calculations based on the results of the 2015 actuarial valuation to demonstrate the impact on Scheme funding and required Employer contribution rates of a "stress test" i.e. an adverse movement in asset values and market yields. We would be pleased to undertake further analysis if required, based on the 2018 valuation, and to liaise with your investment advisers should you wish to consider alternative investment and funding strategies.

11. CONCLUSIONS

11.1 Funding level, Contributions and Recovery Plan

The Scheme's funding level on the Statutory Funding Objective at the valuation date was 109%, equivalent to a deficit of £34.6 million.

The overall joint contribution rate to be paid for future service benefits, ignoring the past service position, is 12.0% of Pensionable Salaries. This is split as follows:

	Salary Sacrifice Members		Non Salary Sacrifice Members	
	Active Members	Employers	Active Members	Employers
	%	%	%	%
Pre-2013 Members paying additional contributions under Rule 45.6	Nil	20.0	8.5	11.5
Other Pre-2013 Members	Nil	16.5	5.0	11.5
Post-2013 Members	Nil	8.8	3.0	5.8

These rates include allowances for expenses, levies and the cost of providing death in service benefits.

With regards to the funding shortfall, the Employers have agreed to continue to pay additional contributions of £14,595,000 from 1 August 2018 to 31 July 2020 which will eliminate the deficit.

11.2 Solvency level

The solvency position of the Scheme is a funding level of 41% at the valuation date. Contributions at the rates above are insufficient to fund the solvency basis. Consequently the above solvency position is expected to deteriorate over the period to the next actuarial valuation.

11.3 Section 179 funding level

The PPF Section 179 position of the Scheme has been measured in line with the prescribed assumptions and benefits as laid down by the PPF Board. At the valuation date the Section 179 funding position was 59%.

This funding level is used by the PPF Board to help it determine the risk based portion of the PPF levy.

11.4 CETVs

I recommend that the CETV basis be reviewed following completion of this valuation to ensure continuing consistency with the final agreed Scheme Funding basis.

11.5 Factors

The actuarial factors used in individual member calculations should be updated following the completion of the valuation to reflect changing economic and demographic conditions.

11.6 Timescale and future valuation requirements

The next triennial valuation is due to take place as at 31 July 2021. As this Scheme has more than 100 members, interim actuarial reports will be required as at 31 July 2019 and 31 July 2020.

As this Scheme has a Recovery Plan, a summary of this valuation report plus copies of the Recovery Plan and Schedule of Contributions needs to be sent to TPR within 10 working days of this report being signed.

Finally a Summary Funding Statement should then be sent to members updating them on the Scheme's funding position. This should be issued no later than 31 January 2020.

Robert. J. Sweet

R J SWEET
Scheme Actuary
Fellow of the Institute and Faculty of Actuaries

30 April 2019

Appendix A – Membership Data

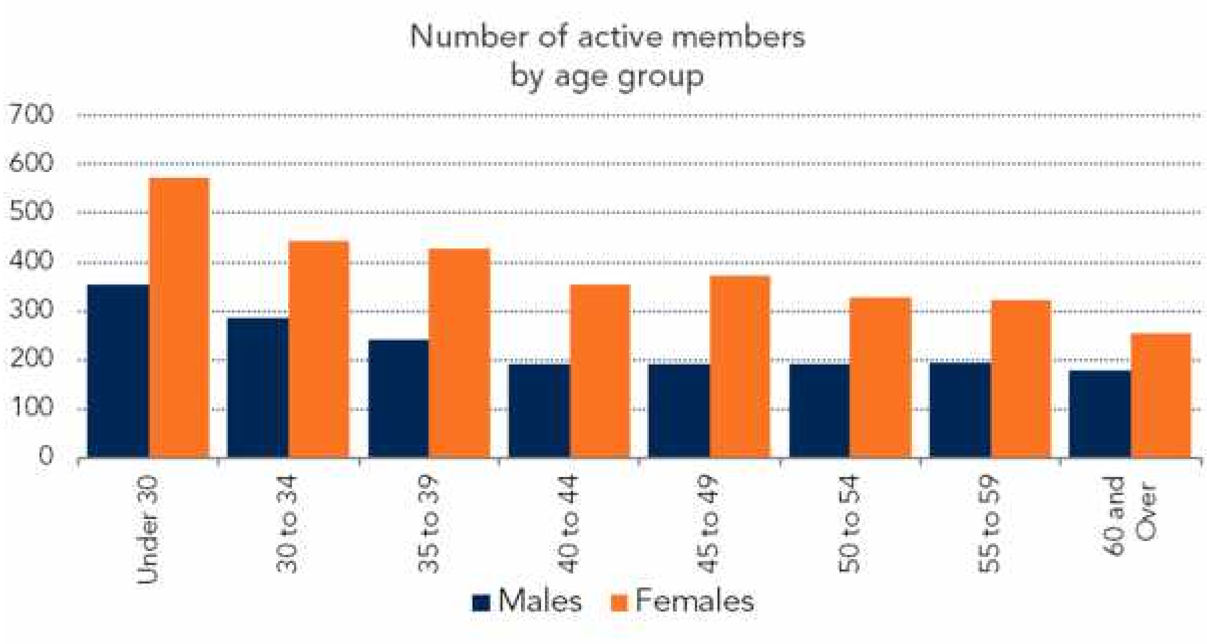
The Scheme membership data was supplied by the Pensions Office on behalf of the Trustee. We have relied on the accuracy of the information provided.

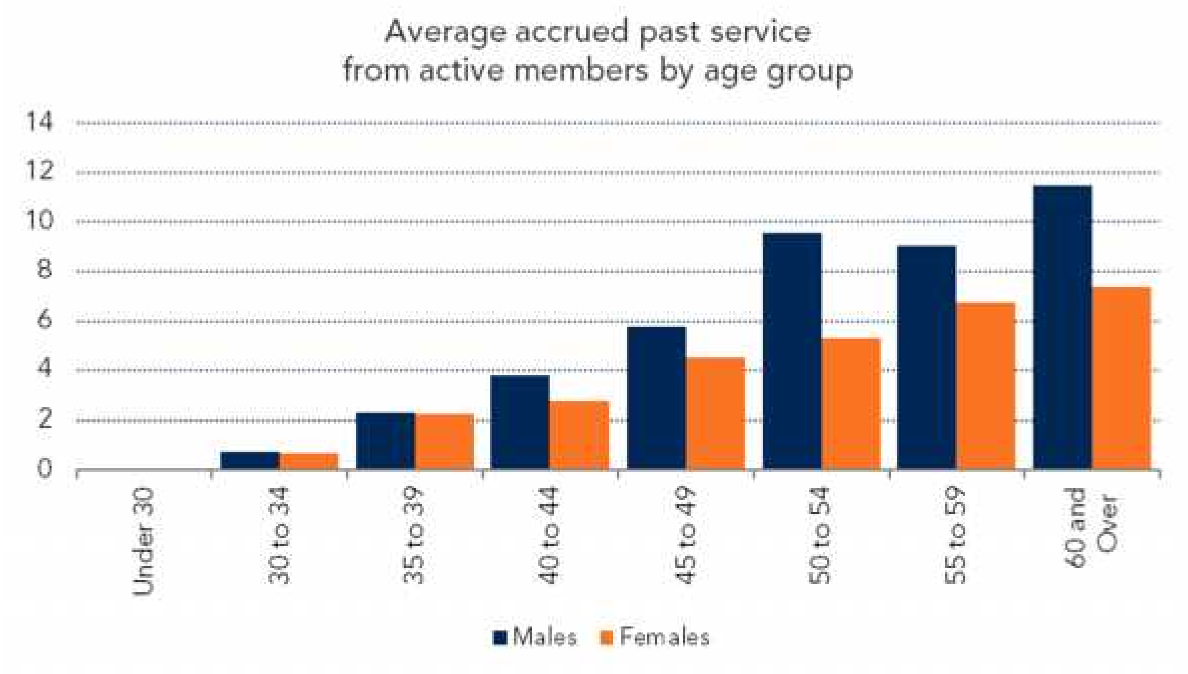
The data used in the valuation is summarised below, the previous valuation data is summarised in brackets for comparison:

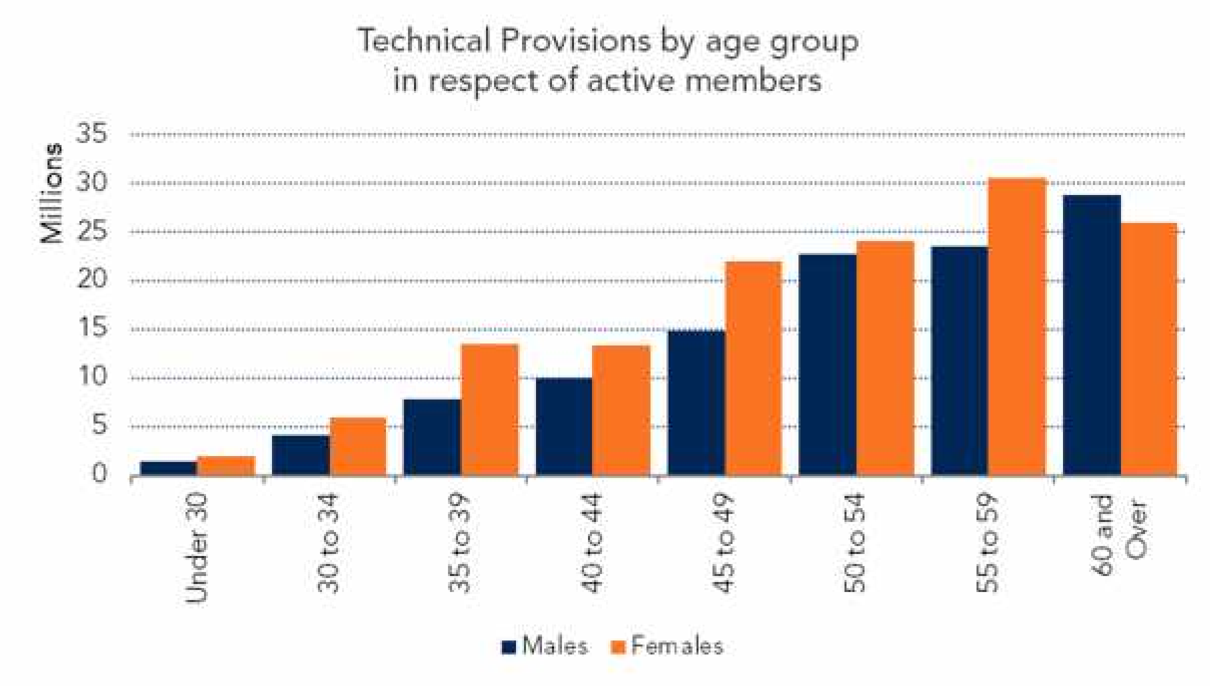
Active Members	Males	Females	Total
Number of members	1,827 (1,696)	3,075 (2,299)	4,902 (3,643)
Total Pensionable Salary, p.a.	£44,848,618 (£40,357,399)	£69,074,207 (£59,546,578)	£113,922,825 (£99,903,977)
Average Pensionable Salary p.a.	£24,548 (£23,796)	£22,463 (£21,645)	£23,240 (£22,465)
Average Pre 1 January 2013 past service (years)	4.5	3.2	3.7
Post 1 January 2013 accrued CRB pension (p.a.)	£1,615,356	£2,299,374	£3,914,730
Average age (unweighted)	42.3	42.3	42.3
Discounted mean term to retirement (years)	10.6	11.3	11.0

Notes

1. The member numbers in the audited accounts are 4,905. We have agreed the above figures with the Pensions Office. There are timing differences in the extracts used for these exercises.
2. The figures for the previous actuarial valuation are shown in brackets where available.
3. Included in these statistics are 427 active members who have not yet retired, but who have passed age 60.
4. Total Pensionable Salaries shown above are the actual Pensionable Salary paid to members (i.e. not full time equivalent for part-timers) as provided to us by the Scheme's Administrator.
5. The Average Past Service is the full time equivalent past service for all members and is represented in the graph below. It includes transferred-in added years, augmentations and AVC added years where appropriate.
6. The discounted Mean Term to Retirement is the average term to the assumed retirement date, weighted by members' Technical Provisions.


Number of active members
by age group
700
600
500
400
300
200
100
0
Under 30
30 to 34
35 to 39
40 to 44
45 to 49
50 to 54
55 to 59
60 and Over
Males
Females

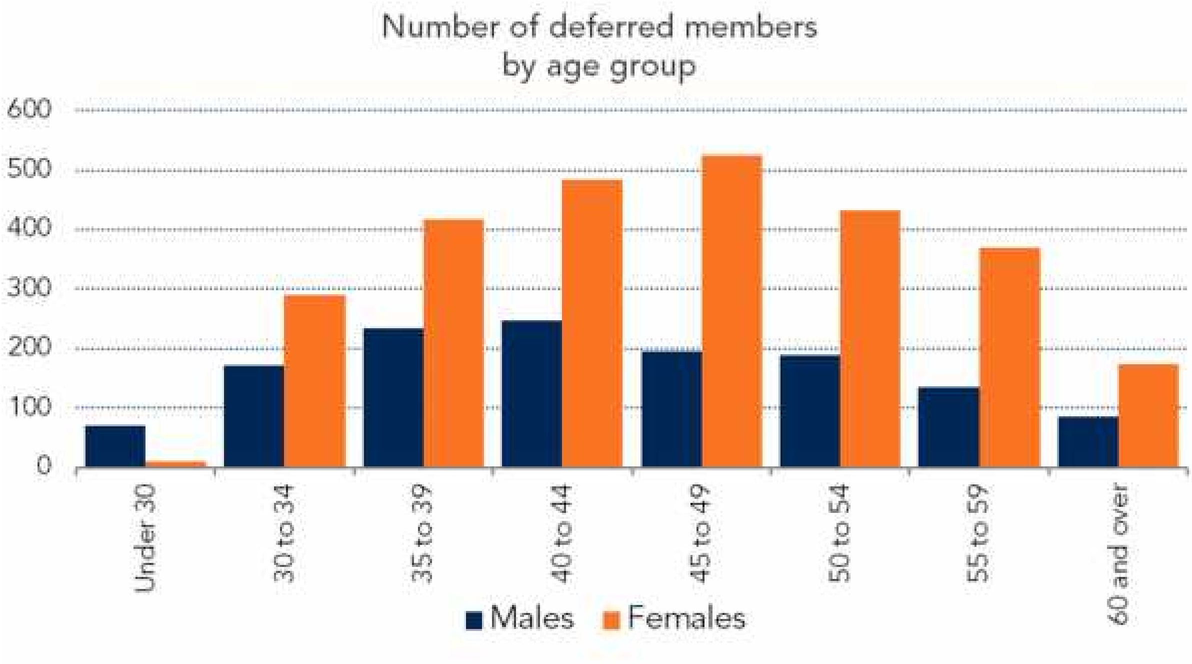

Average accrued past service
from active members by age group
14
12
10
8
6
4
2
0
Under 30
30 to 34
35 to 39
40 to 44
45 to 49
50 to 54
55 to 59
60 and Over
Males
Females

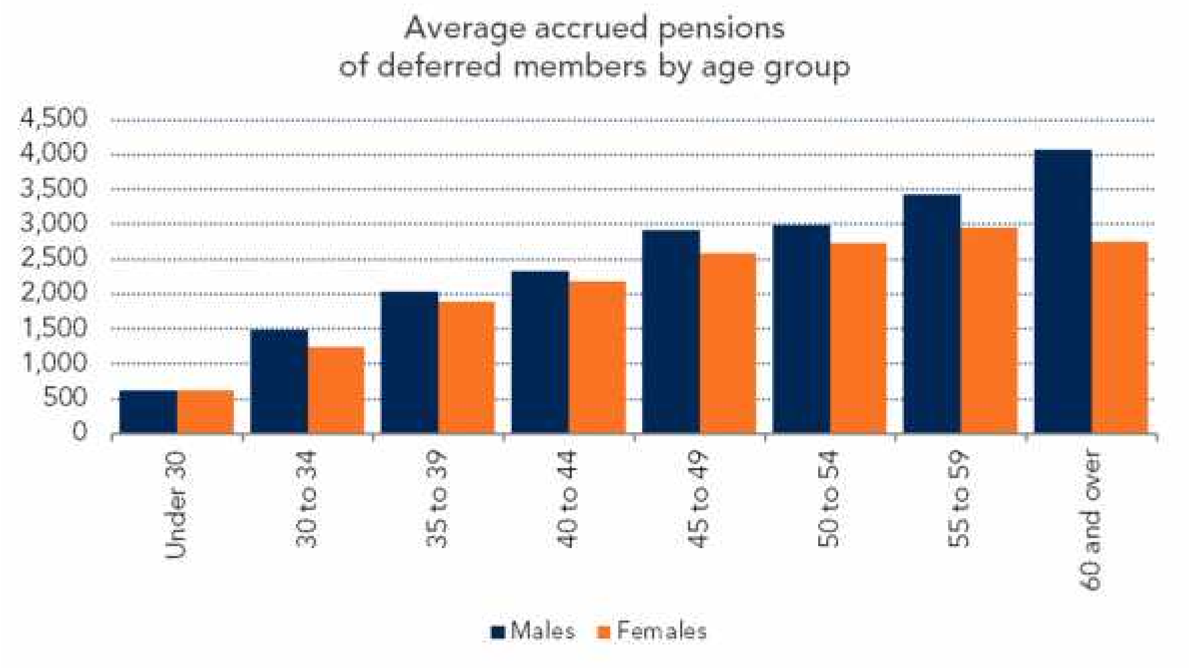


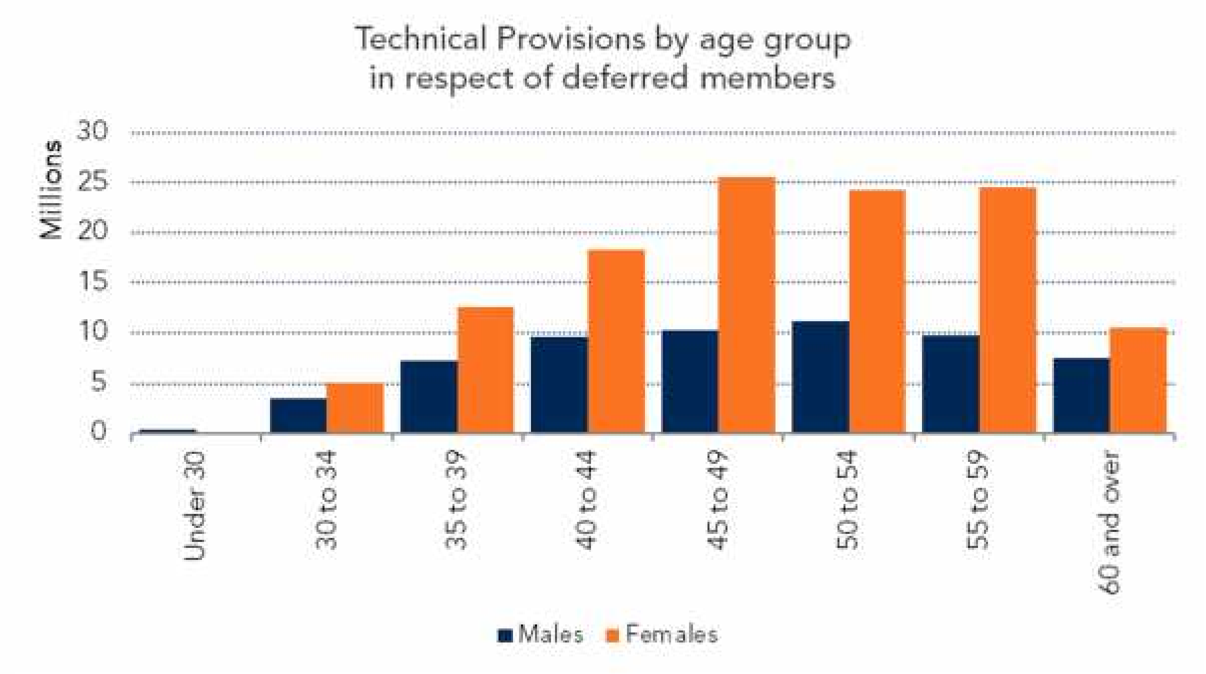
Deferred members	Males	Females	Total
Number of members	1,329 (1,047)	2,704 (2,319)	4,033 (3,366)
Total deferred pensions p.a. payable as at exit date	£3,298,194 (£2,596,986)	£6,311,271 (£5,186,087)	£9,609,465 (£7,783,073)
Average deferred pension p.a. payable as at exit date	£2,482 (£2,480)	£2,334 (£2,236)	£2,383 (£2,312)
Average age (unweighted)	44.5	46.5	45.8
Discounted mean term to retirement (years)	12.1	10.7	11.2

Notes

1. The number of members in the audited accounts is 4,138. We have agreed the above figures with the Pensions Office. There are timing differences in the extracts used for these exercises.
2. The figures for the previous actuarial valuation are shown in brackets where available.
3. Included in these statistics are 259 deferred pensioners who have not yet retired, but who have passed age 60.
4. The following graphs illustrate the current statistics in greater detail.
5. The discounted Mean Term to Retirement is the average term to the assumed retirement date weighted by members' Technical Provisions.
6. In addition, there are 334 short service Pending Members who are due either a Refund of Contributions or Cash Transfer Amount which we have valued accordingly.


Number of deferred members
by age group
600
500
400
300
200
100
0
Under 30
30 to 34
35 to 39
40 to 44
45 to 49
50 to 54
55 to 59
60 and over
Males
Females


Average accrued pensions
of deferred members by age group
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
Under 30
30 to 34
35 to 39
40 to 44
45 to 49
50 to 54
55 to 59
60 and over
Males
Females



Pensioners	Males	Females	Total
Number of members	1,199 (1,138)	1,987 (1,811)	3,186 (2,949)
Total pensions p.a. payable as at valuation date	£9,437,111 (£8,269,763)	£10,026,926 (£8,449,510)	£19,464,037 (£16,719,273)
Average pension p.a. payable as at valuation date	£7,871 (£7,267)	£5,046 (£4,666)	£6,109 (£5,669)
Average age (unweighted)	72.4	71.9	72.1

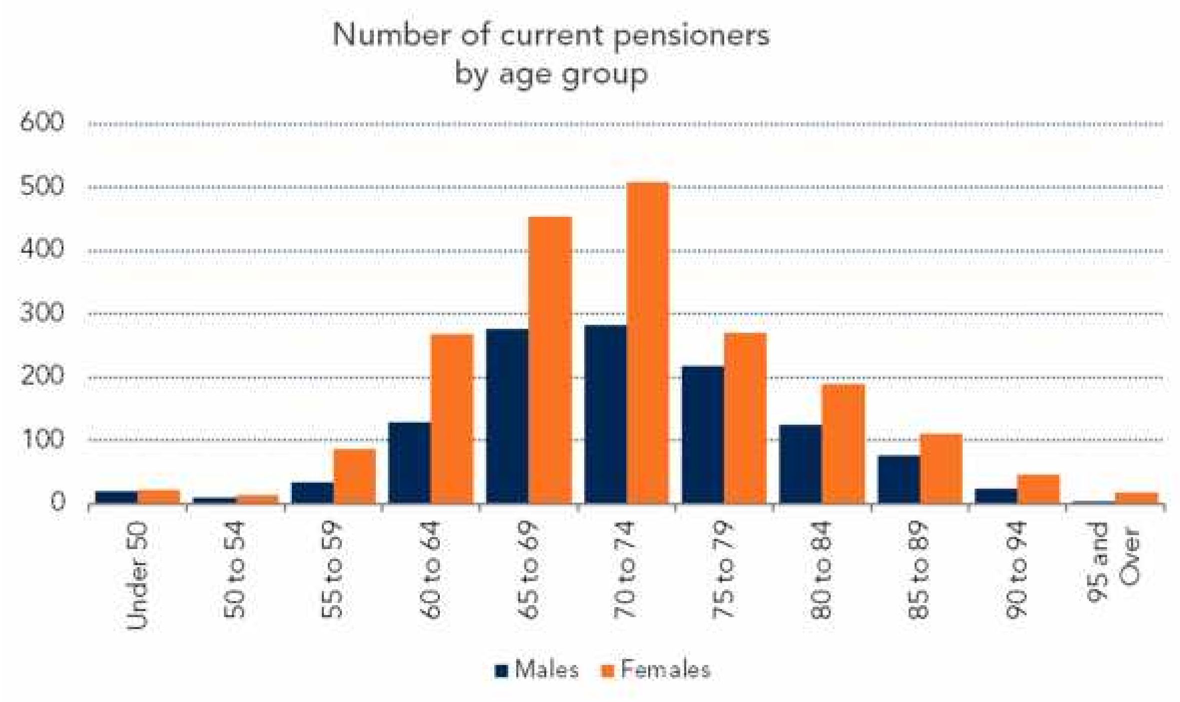
Notes

1. The number of pensioners in the audited accounts is 3,175. We have agreed the above figures with the Pensions Office. There are timing differences in the extracts used for these exercises.

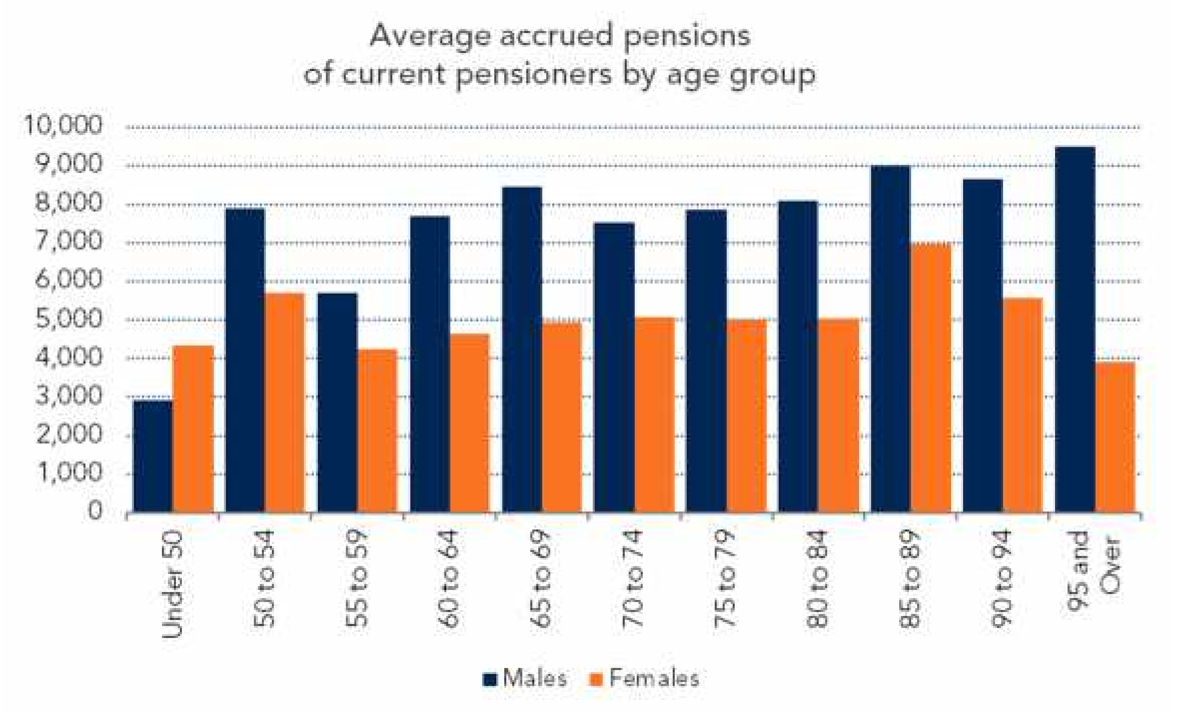
2. The figures for the previous actuarial valuation are shown in brackets where available.

3. There are 427 dependant pensioners included in the above statistics and 16 children sharing dependants' pensions.

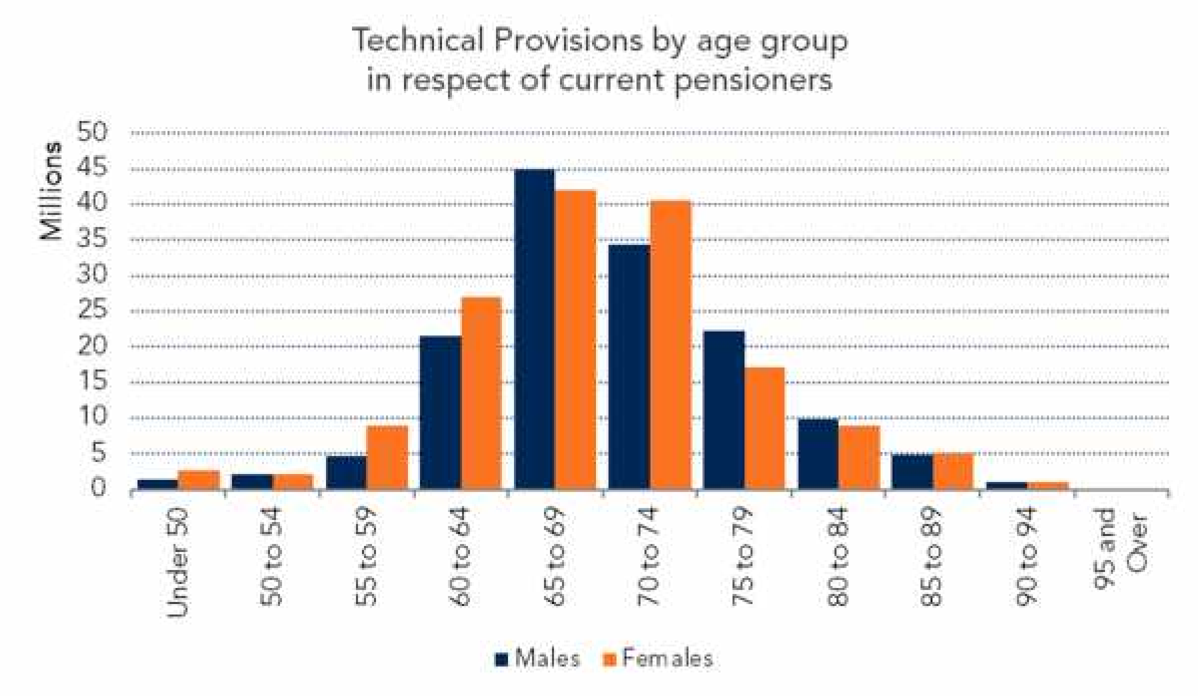
4. The following graphs illustrate the current statistics in greater detail.



Number of current pensioners
by age group
600
500
400
300
200
100
0
Under 50
50 to 54
55 to 59
60 to 64
65 to 69
70 to 74
75 to 79
80 to 84
85 to 89
90 to 94
95 and Over
Males
Females



Average accrued pensions
of current pensioners by age group
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
Under 50
50 to 54
55 to 59
60 to 64
65 to 69
70 to 74
75 to 79
80 to 84
85 to 89
90 to 94
95 and Over
Males
Females

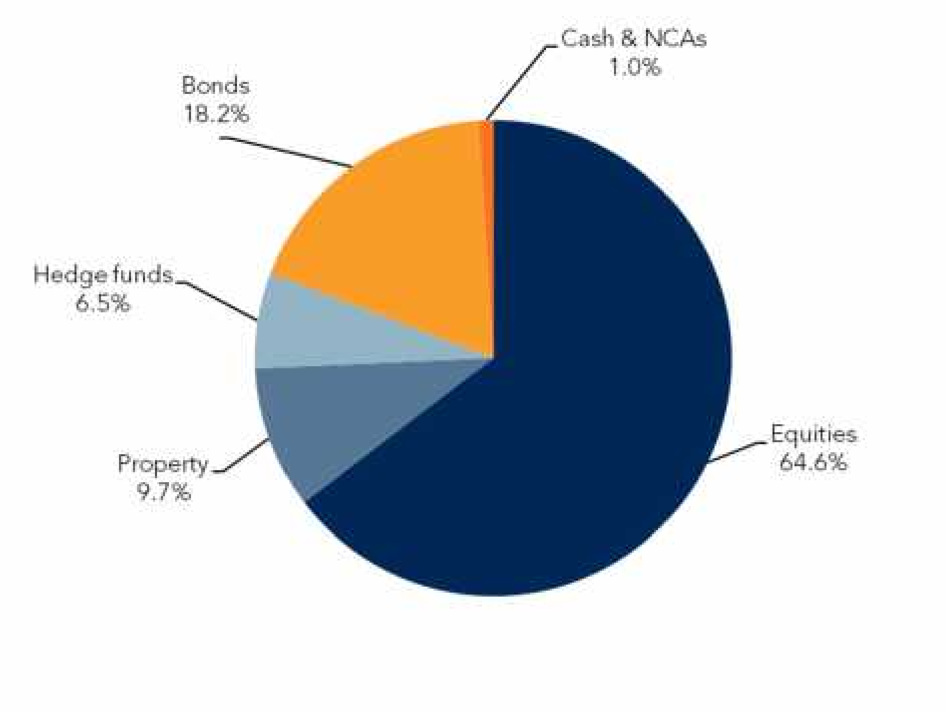

Technical Provisions by age group
in respect of current pensioners
Millions
50
45
40
35
30
25
20
15
10
5
0
Under 50
50 to 54
55 to 59
60 to 64
65 to 69
70 to 74
75 to 79
80 to 84
85 to 89
90 to 94
95 and Over
Males
Females

Appendix B – Scheme Assets

The Scheme's audited accounts show that the Scheme held the following assets, excluding Money Purchase AVCs, as at 31 July 2018:

Market value of Scheme assets	Amount £	Percentage of total assets %
Pooled Investment Vehicles	700,766,789	99.0
Cash	5,630,231	0.8
Net Current Assets	1,670,516	0.2
Total	708,067,536	100.0

Assets split by categories



Appendix C – Summary of Benefits and Member Contributions

The purpose of this section is to provide a commentary on the defined benefits that have been valued, as described in this report. It is not intended that this commentary should provide a definitive statement of the benefits applying under the Scheme: such details are provided in the Scheme's formal documentation.

Eligibility

The Scheme is open to existing members and future new entrants. The employees covered by the Scheme were contracted out of the State Second Pension (S2P) up to 31 December 2012. From 1 January 2013 the Scheme members were contracted back into S2P.

<u>For Scheme Service accrued prior to 1 January 2013 for members who joined the Scheme before 1 December 2009</u>

1.	Normal Pension Age (NPA)	The NPA for all members is 65, although all members may retire at any time after age 60 and receive an immediate unreduced pension.
2.	Pensionable Salary	Basic salary plus any allowances that have been determined to be pensionable by the Employer. It is the amount notified to the Trustee by the Employer which would have applied had the Member not been in the Salary Sacrifice Arrangement.
3.	Final Pensionable Salary	The greatest of: - Pensionable Salary for the last 12 months - Best indexed Pensionable Salary in the 12 month period starting 3 years before retirement, termination or death - Highest indexed average of 3 years Pensionable Salaries in the last 13 years preceding retirement, termination or death - Pensionable Salary in the 12 months ending 3 years before retirement, termination or death – no indexation - Pensionable Salary in the 12 months ending 4 years before retirement, termination or death – no indexation.

4.	Pensionable Service	Pensionable Service is composed of: - the number of years and days contributory membership of the Scheme with a Participating Employer; plus - the number of years and days service, if any, granted in respect of a transfer value paid to the Scheme; plus - the number of years and days service, if any, granted in respect of AVCs.
5.	Normal Retirement Pension	At NPA an annual pension of: 1/60th of Final Pensionable Salary for each year (and proportionately for days) of Pensionable Service.
6.	Early Retirement Pension in Normal Health	Members may retire after age 55 with the consent of the University and the Trustee. <u>All members retiring at or after age 60:</u> 1/60th of Final Pensionable Salary for each year (and proportionately for days) of Pensionable Service. <u>All members retiring between age 55 and 60:</u> 1/60th of Final Pensionable Salary for each year (and proportionately for days) of Pensionable Service, reduced by an actuarial factor depending on the period to age 60.
7.	Exchange of pension for cash	Part of the above pension may be exchanged for a tax free cash lump sum, subject to HM Revenue & Customs limits.
8.	Benefits on Death after Retirement	- The balance, if any, of the first 5 years' payments of the member's pension, is paid as a lump sum *plus* - A spouse's pension of two thirds of the member's pension at the date of death before any exchange of pension for cash *plus* - A funeral grant of £2,500. This is payable net of any tax liability if the member is over age 75 at date of death and retired on or after 6 April 2006.
9.	Increases to Pensions in payment	The increase in the Retail Prices Index (RPI) in the year ending each May, applied at 1 August, subject to a maximum of 12% per annum. Any increase above 12% in any year would be at the discretion of the Managing Committee of the Scheme. If the RPI is below 3% in any year, an increase of more than RPI up to a maximum of 3% could be paid at the discretion of the Managing Committee.

For a Member who joined the Scheme on or after 1 December 2009 and a Former Member who rejoined the Scheme on or after that date, the benefit provisions are the same as the above benefits except where set out separately below:

1.	Normal Pension Age (NPA)	The NPA is 65.
2.	Normal Retirement Benefits	At NPA an annual pension of: 1/80th of Final Pensionable Salary for each year (and proportionately for days) of Pensionable Service. plus A cash lump sum of 3/80th of Final Pensionable Salary for each year (and proportionately for days) of Pensionable Service.
3.	Early Retirement Benefits in Normal Health	Members may retire after age 55 with the consent of the University and the Trustee. The benefits provided to the Member are a pension of 1/80th of Final Pensionable Salary plus a lump sum of 3/80ths of Final Pensionable Salary for each year (and proportionately for days) of Pensionable Service, in both cases reduced by an actuarial factor depending on the period to age 65.
4.	Benefits on Death after Retirement	- The balance, if any, of the first 5 years' payments of the member's pension, is paid as a lump sum plus - A spouse's pension of one half of the member's pension at the date of death before any exchange of pension for cash plus - A funeral grant of £2,500. This is payable net of any tax liability if the member is over age 75 at date of death and retired on or after 6 April 2006.

For Scheme Service accrued on and after 1 January 2013

With effect from 1 January 2013 a new benefit structure has applied to both existing members and those joining the Scheme on or after that date. The Scheme now has 3 different groups of members:

- UNI 1 - Members who joined before 1 December 2009
- UNI 2 - Members who joined after 30 November 2009 and before 1 January 2013
- UNI 3 – Members who join on or after 1 January 2013

Benefits accruing on and after 1 January 2013 are a Career Average Revaluing Earnings pension. It is referred to in the Rules as "CRB Pension".

UNI 1

1.	Normal Pension Age (NPA)	The NPA is 65, but benefits can be drawn unreduced from age 63 onwards Members have the option to pay an additional contribution of 3½% of Pensionable Salary if they wish to draw benefits without reduction from age 60. These members are referred to as UNI4 members.
2.	Scheme Year	A period of 12 months ending on 31 July
3.	Annual CRB Pension	At NPA an annual pension received by Members whilst in the Pensionable Service in the relevant Scheme Year: 1/95th of Pensionable Salary in relation to each Scheme Year ending on or before 31 July 2017 1/95th up to 1 January 2018 and 1/100th between 1 January 2018 and 31 July 2018 of Pensionable Salary in relation to the Scheme Year ending 31 July 2018 1/100th of Pensionable Salary in relation to each Scheme Year ending on or after 31 July 2019. plus A cash lump sum of 3 times the Annual CRB Pensions for each Scheme Year.
4.	CRB Revaluation Percentage	The lesser of 5% per annum and the annual rate of the increase in the Retail Prices Index in the 12 months to the previous May in respect of the relevant Scheme Year
5.	CRB Pension Increase in payment	The lesser of 5% per annum and the annual rate of the increase in the Retail Prices Index in the 12 months to the previous May.
6.	Early Retirement Benefits in Normal Health	Members may retire after age 55 with the consent of the University and the Trustee. Actuarial reduction will apply.
7.	Benefits on Death after Retirement	- The balance, if any, of the first 5 years' payments of the member's pension, is paid as a lump sum plus - A spouse's pension of 75% of the member's pension at the date of death before any exchange of pension for cash

8.	Benefits on Death in Service	- A lump sum of 4 times annual salary at the date of death plus - A spouse's pension of 75% of the member's CRB pensions that the member would have accrued to the Normal Pension Date. plus - A child's pension of 25% of the spouse's pension for each child, (up to a maximum of two) while below age 18 or, if later, receiving full time education to a maximum of age 23. The total of all the spouse's and children's pensions may not exceed the member's prospective pension.
9.	Benefits on Termination of Service	(i) If the member has completed less than 2 years of Qualifying Service, he/she will be entitled to a Short Service Benefit. (ii) If the member has completed 2 or more years Qualifying Service, he/she will be entitled to a CRB Pension accrued to the date of leaving. The benefits will revalue between termination and NRA in line with the CRB Revaluation Percentage.
10.	Member Contribution	5% of Pensionable Salary

UNI 2

1.	Normal Pension Age (NPA)	The NPA is 65.
2.	Scheme Year	A period of 12 months ending on 31 July
3.	Annual CRB Pension	At NPA an annual pension received by Members whilst in the Pensionable Service in the relevant Scheme Year: 1/95th of Pensionable Salary in relation to each Scheme Year ending on or before 31 July 2017 1/95th up to 1 January 2018 and 1/100th between 1 January 2018 and 31 July 2018 of Pensionable Salary in relation to the Scheme Year ending 31 July 2018 1/100th of Pensionable Salary in relation to each Scheme Year ending on or after 31 July 2019. plus A cash lump sum of 3 times the Annual CRB Pensions for each Scheme Year.

4.	CRB Revaluation Percentage	The lesser of 5% per annum and the annual rate of the increase in the Retail Prices Index in the 12 months to the previous May in respect of the relevant Scheme Year
5.	CRB Pension Increase in payment	The lesser of 5% per annum and the annual rate of the increase in the Retail Prices Index in the 12 months to the previous May.
6.	Early Retirement Benefits in Normal Health	Members may retire after age 55 with the consent of the University and the Trustee. Actuarial reduction will apply.
7.	Benefits on Death after Retirement	The balance, if any, of the first 5 years' payments of the member's pension, is paid as a lump sum plus A spouse's pension of 50% of the member's pension at the date of death before any exchange of pension for cash
8.	Benefits on Death in Service	A lump sum of 3 times annual salary at the date of death plus A spouse's pension of 50% of the member's CRB pensions that the member would have accrued to the Normal Pension Date. plus A child's pension of 25% of the spouse's pension for each child, (up to a maximum of two) while below age 18 or, if later, receiving full time education to a maximum of age 23. The total of all the spouse's and children's pensions may not exceed the member's prospective pension.
9.	Benefits on Termination of Service	(i) If the member has completed less than 2 years of Qualifying Service, he/she will be entitled to a Short Service Benefit. (ii) If the member has completed 2 or more years Qualifying Service, he/she will be entitled to a CRB Pension accrued to the date of leaving. The benefits will revalue between termination and NRA in line with the CRB Revaluation Percentage.
10.	Member Contribution	5% of Pensionable Salary

UNI 3

1.	Normal Pension Age (NPA)	The NPA is 65.
2.	Scheme Year	A period of 12 months ending on 31 July
3.	Annual CRB Pension	At NPA an annual pension received by Members whilst in the Pensionable Service in the relevant Scheme Year: 1/150th of Pensionable Salary in relation to each Scheme Year. plus A cash lump sum of 3 times the Annual CRB Pensions for each Scheme Year.
4.	CRB Revaluation Percentage	The lesser of 5% per annum and the annual rate of the increase in the Consumer Prices Index in the 12 months to the previous May in respect of the relevant Scheme Year
5.	CRB Pension Increase in payment	The lesser of 5% per annum and the annual rate of the increase in the Consumer Prices Index in the 12 months to the previous May.
6.	Early Retirement Benefits in Normal Health	Members may retire after age 55 with the consent of the University and the Trustee. Actuarial reduction will apply.
7.	Benefits on Death after Retirement	- The balance, if any, of the first 5 years' payments of the member's pension, is paid as a lump sum plus - A spouse's pension of 50% of the member's pension at the date of death before any exchange of pension for cash
8	Benefits on Death in Service	- A lump sum of 5 times annual salary at the date of death plus - A spouse's pension of 50% of the member's CRB pensions that the member would have accrued to the Normal Pension Date. plus - A child's pension of 25% of the spouse's pension for each child, (up to a maximum of two) while below age 18 or, if later, receiving full time education to a maximum of age 23. The total of all the spouse's and children's pensions may not exceed the member's prospective pension.

9.	Benefits on Termination of Service	(i) If the member has completed less than 2 years of Qualifying Service, he/she will be entitled to a Short Service Benefit. (ii) If the member has completed 2 or more years Qualifying Service, he/she will be entitled to a CRB Pension accrued to the date of leaving. The benefits will revalue between termination and NRA in line with the CRB Revaluation Percentage.
10.	Member Contribution	3% of Pensionable Salary

9.	Benefits on Termination of Service	(i) If the member has completed less than 2 years of Qualifying Service, he/she will be entitled to a Short Service Benefit. (ii) If the member has completed 2 or more years Qualifying Service, he/she will be entitled to a CRB Pension accrued to the date of leaving. The benefits will revalue between termination and NRA in line with the CRB Revaluation Percentage.
10.	Member Contribution	3% of Pensionable Salary

STATEMENT OF FUNDING PRINCIPLES

CAMBRIDGE UNIVERSITY ASSISTANTS' CONTRIBUTORY PENSION SCHEME

Status

This Statement has been prepared by C U Pension Trustee Limited ("the Trustee") acting as Trustee of the Scheme for the purposes of the actuarial valuation as at 31 July 2018 after taking advice from Robert Sweet of Cartwright Group Limited, the current Actuary to the Scheme.

It replaces an earlier version dated 28 February 2016 prepared for the actuarial valuation as at 31 July 2015.

Statutory Funding Objective

This statement sets out the Trustee's policy for securing that the statutory funding objective is met.

The statutory funding objective is defined in Section 222 of the Pensions Act 2004. Every scheme must have sufficient and appropriate assets to cover its technical provisions.

Technical provisions – method

The actuarial method used in the calculation of the technical provisions and future service costs is the Projected Unit Method. A control period of 4 years and 9 months is used for the calculation of the future service cost.

Technical provisions – assumptions

The following sets out the principles behind setting the actuarial assumptions for the funding of the Scheme.

Discount Rate (also referred to as "interest rate")

Technical provisions are determined using a single rate of interest for all pre and post-retirement benefits.

On retirement, Members' pensions are paid from the fund. Assets providing a risk free rate of return, such as Government bonds (gilts) provide a good match for pensions in payment.

The Trustee invests in a wide range of assets including equities and property, which are expected to give long term returns in excess of those available on gilts. The Trustee wishes to take credit for some of this out-performance and to that end will use an interest rate of Retail Price Inflation (RPI, as defined below) plus a margin of up to 4% per annum to allow for this expected out-performance.

The Trustee has determined that different margins will be adopted for the purposes of the past & future service calculations as at 31 July 2018:

- Past service - the margin is 1.9% per annum; and
- Future service - the margin is 2.6% per annum.

Pension increases in deferment

For all pension earned prior to 2013, the Trustee's main revaluation assumption is set to be the same as the assumption for future increases in the Retail Prices Index (RPI).

The Retail Prices Index (RPI) assumption will be determined at the valuation date based on the Bank of England spot yield at a point consistent with the duration of the Scheme liabilities. This rate will then be adjusted by an allowance for the Inflation Risk Premium, which for the purposes of the 2018 valuation the Trustee has determined should be 0.2% per annum. The overall rate will be rounded to the nearer 0.05% per annum. At this valuation the weighted duration of the liabilities has been calculated as 19 years, and the spot yield at the valuation date is 3.44% per annum. The RPI assumption is therefore 3.25% per annum.

There is also a revaluation underpin based on statutory revaluation. Statutory revaluation on the pension in excess of any GMP is in line with increases in the Consumer Prices Index (CPI). The Trustee has agreed that this assumption should be equal to the assumption for future RPI increases less 1.0% per annum.

For pension earned on or after 1 January 2013, increases to pensions accrued in service and after leaving service are to be calculated by reference to the RPI (or CPI for joiners on or after 1 January 2013) capped at a maximum of 5% per annum compound.

Salary Increases

Pay increases are expected to exceed CPI increases by 2.0% per annum compound. This relationship with CPI is monitored for accuracy and may be subject to change in future valuations.

Pension increases in payment

Pension increases in payment are defined in the Rules.

a) Pensions earned prior to 2013:

   These increase in line with the RPI up to a maximum of 12% per annum compound. For this pension increase the Trustee will use the same assumption as that used for RPI above up to the maximum.

b) For pensions earned on or after 1 January 2013:

   The Black-Scholes model can be used for pricing these pension increases, where appropriate. This model determines the fair market value for an option over a particular stock, and can be adapted to model future pension increases where these are linked to inflation subject to a ceiling (or cap). It results in an assumption for the average rate of pension increases which is slightly lower than the inflation assumptions, to allow for the impact of these caps.

   For Pre 2013 joiners, pensions increase in line with the RPI up to a maximum of 5% per annum compound. For this valuation a rate of 3.15% per annum has been adopted.

   For joiners on or after 1 January 2013, pensions increase in line with CPI up to a maximum of 5% per annum compound. For this valuation a rate of 2.25% per annum has been adopted.

Mortality

It is the intention of the Trustee to use both mortality tables that reflect as much as possible, actual Scheme experience with a suitable allowance for likely mortality improvements over the medium to long term.

Currently, the Trustee is using S2 base tables produced by the Continuous Mortality Investigation Bureau based upon mortality experience of Self-Administered Pension Schemes centred on 2007 but then projected to allow for subsequent improvements in longevity.

After carrying out a mortality investigation on Scheme experience on data between 1 August 2011 and 31 July 2017 the Actuary recommended and the Trustee agreed to adjust the S2NA base tables for males and females by 121% and 90% respectively and adopt these for the 2018 valuation.

In addition, the Actuary recommended and the Trustee agreed to make allowance for future longevity improvements using the CMI 2017 projection table, with long term rates of improvement of 1.25% per annum.

These tables and adjustments are subject to regular review and will be updated in future valuations as more up-to-date data becomes available.

New Entrants

The Scheme is open to new entrants. The Trustee does not allow explicitly for new entrants. However, by adopting the Projected Unit Method, to give a stable normal contribution rate, they are implicitly assuming that the active membership average age remains relatively constant – i.e. that new entrants will continue to join the Scheme.

Commutation

On retirement, no allowance is made for Members who commute part of their pension for a cash lump sum at retirement.

Leaving Service

The Scheme is relatively large; as it is prudent to assume that no-one leaves early, the Trustee therefore makes no allowance for early leavers. Any members leaving early are likely to release a surplus from the Scheme; this will be used to reduce future contribution rates when appropriate.

Retirement

The Scheme Normal Retirement Age is 65 although members who joined prior to 1 December 2009 have the right to retire without actuarial reduction at age 60. The Trustee wishes to fund benefits to the average expected age of retirement of such members.

Investigations of the pattern of retirements between 1 August 2011 and 31 July 2017 (investigated in 2018) suggest that, on average, Active males currently retire at age 63 and females retire at age 62, whilst Deferred males and females retire at age 61. These average retirement ages will be reviewed by the actuary at each subsequent triennial valuation to ensure that they remain in line with actual Scheme experience.

Members who joined on or after 1 December 2009 are assumed to retire at age 65.

Age Difference of Dependants

Husbands are assumed to be 3 years' older than their wives.

Percentage with Dependant's Benefits at Death

85% of male and female members are assumed to be married at death.

Expenses

Expenses of administering the Scheme are borne by the Scheme. Part of the expenses relates to past service and part relates to current and future service.

The Trustee's policy is for the actuary to review the allowance for expenses at each valuation and make a recommendation for both elements.

The current assumption is for a past service reserve of 1% of the Technical Provisions and a future allowance of 0.9% of Pensionable Salaries. This is to cover all expenses and levies of administering the Scheme.

Policy on discretionary increases and funding strategy

In the past when RPI has been less than 3% per annum the Trustee has reviewed the pension increase to be paid and has increased it, on occasion, at up to 3% per annum. The current policy is not to fund for increases in excess of RPI, but to review the cost in such years when this situation occurs and decide on whether the Scheme and/or the Employers can afford the additional increase.

Period within which and manner in which a failure to meet the Statutory Funding Objective is to be rectified

The Trustee and the Principal Employer have agreed that any funding shortfalls identified at an actuarial valuation should be eliminated as quickly as the Employers can reasonably afford by the payment of additional contributions. In determining the actual recovery period at any particular valuation the Trustee's principles are to take into account the following factors:

- the size of the funding shortfall;
- the business plans of the University and the other Employers;
- the Trustee's assessment of the financial covenant of the University and the other Employers (and in making this assessment the Trustee will make use of appropriate credit assessment providers); and
- any contingent security offered by the University and the other Employers.

The assumptions to be used in calculating the additional contributions required will be those set out above for calculation of the Technical Provisions, except that the expected rate of return (the return on existing assets and on new contributions during the period of the Recovery Plan) may be set at a higher rate than the discount rate. For the purposes of the Recovery Plan the Trustee has decided that the appropriate expected rate of return is 0.7% per annum higher than the prudent discount rate adopted for the calculation of the past service cost, i.e. 5.85% per annum.

Arrangement by a person other than an Employer or a Scheme member to contribute to the Scheme

There are no arrangements for a person other than an Employer or a Scheme member to contribute to the Scheme.

Policy on reduction of cash equivalent transfer values (CETVs)

The Trustee asks the Scheme Actuary to advise at each valuation of the extent to which assets are sufficient to provide CETVs for all non pensioners without adversely affecting the security of the benefits of other members and beneficiaries.

If at any time, after obtaining advice from the Scheme Actuary, the Trustee is of the opinion that the payment of CETVs at a previously agreed level may adversely affect the security of the benefits of other members and beneficiaries, the Trustee will commission a report from the Scheme Actuary to decide whether, and to what extent, CETVs should be reduced.

Payments to the Employers

If the Scheme is not being wound up and the assets of the Scheme exceed the estimate by the Scheme Actuary of the cost of buying out the benefits of all beneficiaries from an insurance company, including the expenses of doing so, the Employers may receive a payment of the excess. If the Scheme Actuary certifies that the requirements of the Pensions Act 2004 have been met and certifies the maximum amount that may be paid, the Trustee will consider whether a payment would be in the interest of the members, and if so, the Trustee will give notice to the members of the proposal.

Frequency of Valuations and circumstances for extra Valuations

The Scheme's most recent actuarial valuation under Part 3 of the Pensions Act 2004 was carried out as at the effective date of 31 July 2018 and subsequent valuations will in normal circumstances be carried out every three years thereafter. An actuarial report on developments affecting the Scheme's funding level will be obtained as at each intermediate anniversary of that date.

The Trustee may call for a full actuarial valuation instead of an actuarial report when, after considering the Scheme Actuary's advice, they are of the opinion that events have made it unsafe to continue to rely on the results of the previous valuation as the basis for future contributions. However, the Trustee will consult with the Principal Employer before doing so.

For and on behalf of the University of Cambridge ("the Principal Employer")

Signed: ....

Name: D Hughes

Position: Director of Finance

Date: 30 April 2019

On behalf of C U Pension Trustee Limited ("the Trustee")

Signed: ....

Name: H R Jacobs

Position: Director

Date: 30 April 2019

This Statement of Funding Principles has been agreed by the Trustee after obtaining my actuarial advice.

Signed:

Name: R J SWEET

Position: Scheme Actuary

Date: 30 April 2019

Appendix E – Assumptions

The 2018 Funding Basis is based on Statutory Funding Objective and the Statement of Funding Principles adopted by the Trustee. The 2015 Funding Basis sets out the assumptions used in the previous valuation for comparison purposes.

Under the Code, when choosing the assumptions the Trustee are required to consider the factors particular to the Employers, or the Employers' industry, affecting matters such as pay increases, rate of withdrawal from membership and recruitment. The Trustee are satisfied that the chosen assumptions set out below are appropriate bearing in mind the above factors.

	Assumptions for Valuation as at 31 July 2015 (% p.a. compound)	Assumptions for Valuation as at 31 July 2018 (% p.a. compound)
Economic (% p.a. compound)		
Discount rate	6.1%	5.15%
Asset return for Recovery Plan	7.0%	5.85%
Rate of Salary increases	4.9%	4.25%
Rate of increase to pensions in payment: - RPI max 12%, min 0% - RPI max 5%, min 0% - CPI max 5%, min 0%	 3.4% 3.4% 2.7%	 3.25% 3.15% 2.25%

Rate of increases to pensions in deferment:
- GMP
- Pensions in excess of GMP:
  - RPI
  - CPI
	
	4.9%
	
	3.4%
	2.7%
		
		4.25%
		
		3.25%
		2.25%

Assets & Expenses		
Valuation of assets:	Surrender value of the assets	Surrender value of the assets
Expenses: - Past service - Future service	 1.0% of the liability excluding expenses 0.9% of Pensionable Salary	 1.0% of the liability excluding expenses 0.9% of Pensionable Salary
Death in Service Premiums:	n/a	n/a
Pension Protection Fund levies:	Included in the future service cost expenses	Included in the future service cost expenses

	Assumptions for Valuation as at 31 July 2015	Assumptions for valuation as at 31 July 2018
Demographic		
Rate of mortality	125% of S2LPA pension mortality tables for males and 95% of S2LPA pension mortality tables for females. Plus a projection based upon the CMI_2014 model with a long-term 1.25% p.a. improvement.	121% of S2NMA pension mortality tables for males and 90% of S2NFA pension mortality tables for females. Plus a projection based upon the CMI_2017 model with a long-term 1.25% p.a. improvement.
Assumed Age at Retirement:		
UNI 1		
Active members	Males 63 Females 61	Males 63 Females 62
Deferred members	Males 61 Females 60	Males 61 Females 61
UNI 2 & UNI 3	Males 65 Females 65	Males 65 Females 65
Proportion married	85%	85%
Age difference	Women 3 years younger than their partners	Women 3 years younger than their partners
Withdrawal rates	No allowance	No allowance
Member options	No allowance	No allowance

Appendix F – Actuary's Certification of the Calculation of Technical Provisions

Name of Scheme: Cambridge University Assistants' Contributory Pension Scheme

Calculation of Technical Provisions

I certify that, in my opinion, the calculation of the Scheme's technical provisions as at 31 July 2018 is made in accordance with regulations under section 222 of the Pensions Act 2004. The calculation uses a method and assumptions determined by the Trustee of the Scheme and set out in the Statement of Funding Principles dated 30 April 2019.

Signed:	Robert. J. Sweet	Date:	30 April 2019
Name:	R J Sweet	Qualification	Fellow of the Institute and Faculty of Actuaries
Address:	Mill Pool House Mill Lane Godalming Surrey GU7 1EY	Employer:	Cartwright Group Limited

Appendix G – Glossary

Actuarial Report

Introduced by the Pensions Act 2004, this is a written report, prepared and signed by the Scheme Actuary, on developments affecting the Scheme's Technical Provisions since the last actuarial valuation. It must also include an assessment of changes in the value of the Scheme's assets.

Actuarial Valuation

Defined by the Pensions Act 2004 as a written report, prepared and signed by the Scheme Actuary, valuing the Scheme's assets and calculating its Technical Provisions.

Code of Practice 3 – Funding Defined Benefit Schemes

This is a written document dated July 2014 setting out the Pension Regulator's guidance and standards of conduct for Trustees with regard to funding their defined benefit pension scheme.

Recovery Plan

Where a scheme has a deficit on the Statutory Funding Objective a Recovery Plan is needed to remove the deficit. The Scheme should detail the period and means by which the deficit will be eliminated.

Schedule of Contributions

This is a written document detailing the contributions payable to the Scheme from the date of the Schedule for a period of 5 years or such longer period as the Recovery Plan applies. The contributions on the Schedule must be sufficient to ensure the Scheme's assets cover the Technical Provisions by the end of the period it covers.

Statement of Funding Principles

This is a document produced by the Trustees and agreed by the Employers. It sets out details of the method and assumptions to use to meet the Statutory Funding Objective as well as any other objectives the Trustees have and details of the Recovery Plan.

Statutory Funding Objective

Introduced by the Pensions Act 2004, this is the funding target the Scheme must meet. The assumptions chosen to calculate the target must be chosen in a prudent manner and reflect market conditions.

Technical Provisions

This is the name given to the Scheme's liabilities calculated using the method and assumptions set out in the Statement of Funding Principles. The Trustees and Employers should aim to fund 100% of the Scheme's Technical Provisions.