

Actuarial Valuation as at 31 March 1999

An actuarial valuation of Universities Superannuation Scheme has been carried out as at 31 March 1999 by the actuary, Mr M B Reid of William M Mercer Limited.

Mr Reid's report on the 1999 actuarial valuation was accepted by the USS management committee at its meeting on 23 March 2000. The result of the actuarial valuation and the main features of the report were announced to delegates attending the annual meeting of USS institutions on 10 December 1999 (the full report of which can be viewed on the USS website <http://www.usshq.co.uk>.)

The report on the 1999 actuarial valuation is being made available to all USS institutions and it is printed in full in this booklet. The result of the valuation may be summarised as follows:

1. The employers' contribution rate is maintained at 14.0% of annual salary.
2. The overall past service surplus of £1,442.8m represents 8.3% of the past service liabilities of the scheme. There is a surplus of £76.2m attributable to the Supplementary Section leaving a past service surplus of £1,366.6m in the Main Section.
3. The institution contribution rate required for the future service benefits alone is 16.3% of salaries.
4. To fund the reduction of 2.3% below the institution contribution rate of 16.3% of salaries for the next 11 years will require the use of £561.3m of the Main Section surplus. This period of 11 years is the average outstanding working lifetime of the current members.
5. It has also been agreed that £201.0m of the surplus will be used to fund the following improvements in benefits:
 - removal of young spouses' reductions
 - 1% special pension increase to all non-active members
 - increase in lump sum death benefit from 2½ to 3 times salary
6. A past service surplus of £606.4m will be carried forward in the Main Section together with £74.1m in the Supplementary Section, ie a total past service surplus of £680.5m will be carried forward.
7. The contribution rate will be subject to review at the next actuarial valuation which would normally take place at 31 March 2002.
8. The management committee considers that the funding objective, the valuation method and the assumptions underlying the valuation calculations represent a satisfactory basis for the long-term funding of the benefits provided by USS.

D B Chynoweth
Chief Executive
Universities Superannuation Scheme Limited
March 2000

Section 1 - Introduction

- 1.1** In accordance with the instructions of the Trustee Company and under the provisions of Rule 20.20, I have undertaken an actuarial valuation of the Universities Superannuation Scheme ("the Scheme") as at 31 March 1999 and now have pleasure in submitting my report to the Trustee Company.
- 1.2** The previous actuarial valuation of the Scheme was undertaken as at 31 March 1996. This report has been prepared in accordance with the current guidelines "Retirement Benefit Schemes - Actuarial Reports (GN9)" published jointly by the Institute of Actuaries and the Faculty of Actuaries.

Section 2 - Object of the Valuation

2.1 Purpose of the Valuation

The purpose of the actuarial valuations is to:-

- examine the financial position of the Scheme in relation to the benefits already promised and
- assess the adequacy or otherwise of the current rate of contribution.

2.2 Funding Objective

2.2.1 Funding is the making of financial provision in advance to meet the cost of accruing pension benefit promises. There is a considerable choice about the pace at which this advance provision can be made and the pace is best decided by having a funding objective.

2.2.2 The Trustee Company has for this valuation decided to use the equivalent funding objective for the Scheme as was used in the 1996 valuation. The objective is to maintain the fund at or above 100% of the projected past service liability. For the 1996 valuation the funding objective was to achieve a fund at 100% of the projected past service liability and thereafter to maintain the fund at or about this level. The slight change in objective is because the 1996 valuation disclosed a funding level above 100%, whereas previously the funding level had been below 100%.

2.2.3 This funding objective is, therefore, designed to:-

- give members a reasonable level of security in respect of accrued pension rights and
- ensure that the Institution contribution rate to the Scheme is realistic and that it is reasonably stable.

Section 3 - Benefits and Contributions

3.1 Outline

3.1.1 The Scheme provides pension and other superannuation benefits for the academic and senior administrative staff of participating universities and certain other bodies engaged in higher education or research ("the Institutions"). Subsequent to the valuation date the Rules of the Scheme have been amended to allow an expansion of membership to non-academic related employees.

3.1.2 Appendix A sets out an outline of the conditions for membership, contributions and benefits of the Scheme at the valuation date.

3.1.3 The Universities Superannuation Scheme

- has an effective date of commencement of 1 April 1975
- is approved by the Inland Revenue under Chapter I Part XIV of the Income and Corporation Taxes Act 1988
- is contracted-out of the State Earnings-Related Pension Scheme (SERPS) under the provisions of the Social Security Pensions Act 1975 on the Reference Scheme Test basis.

3.2 Changes During Intervaluation Period

The following benefit changes were made to the Scheme during the intervaluation period and have been allowed for in this valuation:-

- The lump sum benefit payable on death in service before Normal Retirement Age has been increased to 2½ times salary at date of death (previously twice salary)
- Spouses' pensions now continue to be paid on remarriage or cohabitation
- Reductions to spouses' pensions becoming payable in respect of spouses of members who were active on or after 1 April 1997 are now applied where the spouse is more than fifteen years younger than the member (previously ten years younger)
- Provisions have been introduced to enable members to opt at retirement to convert pension into lump sum and vice versa, subject to the limits imposed by the Inland Revenue. The terms of these conversion options are set so as to be financially neutral to the funding of the Scheme
- Provisions have been introduced to enable benefits in kind to be treated as pensionable.

3.3 Pension Increases

3.3.1 During the intervaluation period, the rates of increase to pensions in payment and in deferment have been as follows:-

Date	Rate of Increase
April 1996	3.9%
April 1997	3.0%*
April 1998	3.6%
* Including a special increase of 0.9% above the Retail Prices Index	

3.3.2 The 1996 pension increase was allowed for in the last valuation. A further increase at the rate of 3.2% has been made in April 1999 and this has been allowed for in the current valuation.

Section 4 - Membership

4.1 Membership Details

- Data have been provided by Universities Superannuation Scheme Limited.
- A brief summary of the combined membership details as at 31 March 1999 is set out below, the corresponding details as at 31 March 1996 being in brackets. A more detailed summary of the membership is shown in Appendix B.

	Numbers	Total Annual Salaries/Pensions	
Active Members	81,593 (74,629)	£2,353.3m	(£2,009.3m)
Current Beneficiaries	29,803 (23,918)	£404.4m	(£287.7m)
Deferred Pensioners	37,991 (27,470)	£70.2m	(£49.6m)

Annual salaries are shown for active members and annual pensions for current beneficiaries and deferred pensioners. Annual pensions include pensions payable from the Supplementary Section. For current beneficiaries the 1996 annual pensions exclude the 1996 pension increase award, whereas the 1999 annual pensions include the 1999 pensions increase award. The deferred pensions have been estimated including allowance for the relevant increases up to the valuation date, including the increase in April each valuation year.

- During the 3 years under review, active membership has increased by 9 per cent whilst total salaries have increased by 17 per cent. The increase in average salaries has been 7 per cent (i.e. just over 2 per cent per annum over the intervaluation period). These figures reflect the effects of general salary increases and membership changes.
- As part of the valuation, I have carried out simple validation checks on the data. These checks cannot guarantee the complete accuracy of the data and, for this purpose, the valuation relies on the regular checks which are carried out by the administrators and auditors.

Section 5 - Assets

5.1 Assets Held by the Scheme

The market value of the assets held by the Scheme at 31 March 1999 was £18,815.3m based on the audited accounts. A summary of the distribution of assets is set out in Appendix C.

5.2 Total Market Value

I have also made allowance for the estimated outstanding bulk transfer payment due from the National Health Service Pension Scheme (NHSPS) in respect of the Colleges of Nursing staff. As at 31 March 1999 values I estimate this amount to be £54.3m. Therefore I have taken the asset value of the Scheme as £18,869.6m.

5.3 Investment Policy

I am satisfied that the investment policy followed is appropriate to the liabilities of the Scheme.

5.4 Income and Expenditure

A summary of the income and expenditure of the Scheme over the intervaluation period is set out in Appendix D.

Section 6 - Actuarial Method and Assumptions

6.1 Valuation Method

6.1.1 The method used is known as the projected unit method. This is the same method as was adopted for the 1996 valuation and I consider it to be an appropriate method to adopt, having regard to the funding objective set out in Section 2.2.2.

6.1.2 Under the projected unit method:-

- benefits relating to past and future service are dealt with separately
- the normal contribution rate for future service is calculated as the value of benefits expected to accrue to the membership in respect of one year's service
- if the membership profile of active members remains stable in terms of age, sex and salary, then the normal contribution rate (as a percentage of salaries) will remain stable, subject to any changes to the assumptions. The method therefore implicitly allows for new entrants
- if the supply of new entrants to the Scheme is cut off or declines, then the normal contribution rate will tend to rise at future valuations
- the actuarial past service liability is calculated as the present value of accrued liabilities at the valuation date (allowing for projected salaries for members in service and for future pension increases) and is then compared with the actuarial value of the Scheme's assets
- if the past service position shows an imbalance of assets and liabilities, the normal contribution rate may be varied appropriately.

6.2 Valuation Assumptions

6.2.1 In past actuarial valuations – including the 1996 valuation of the Scheme – the financial assumptions were established as being reasonable in the long term. Where possible, the main assumptions were not changed from one valuation to the next. An actuarially calculated valuation of the assets was used, valuing the proceeds of the investments (dividends, rentals, interest and capital redemption) using the same assumptions as for valuing the liabilities. This ensured consistency between the asset and liability valuations.

6.2.2 The assumptions adopted for the previous valuation are summarised in Appendix E to this report.

6.2.3 The most significant actuarial assumptions are the financial ones, namely:-

- Future investment returns, i.e. the valuation rate of interest
- Future salary inflation
- Future pension increases

6.2.4 For this valuation it has been agreed on my recommendation to change to a market value approach for the financial assumptions.

6.2.5 The market value approach takes as its starting point yields available from fixed interest and index-linked gilts. The implicit assumption is then that these rates of interest are consistent with the market valuation of equities at the valuation date (incorporating the markets' expectation of dividend growth). The difference between fixed interest and index-linked yields can be used to derive an acceptable estimate of inflation. This is effectively a risk-neutral inflation assumption.

6.2.6 The underlying market related assumptions are thus derived objectively. If an adjustment is then made to allow for salary inflation in excess of price inflation, such assumptions could then be said to represent the "true" economic cost of the liabilities. However, the Scheme is pursuing a mainly equity led investment strategy. Consequently, in considering the long-term funding of the Scheme required to meet the cost of the liabilities, it would not be unreasonable to allow for a rate of expected investment return in excess of that implied by Government Securities.

6.2.7 The approach has two key subjective elements in the basis, namely:-

a) Assumed excess rate of the Scheme's investment return over that implied by Government Securities

b) Assumed excess rate of salary inflation over price inflation.

The setting of these two subjective elements of the actuarial basis will be determined by whether a cautious or optimistic approach to the funding of the Scheme is to be adopted.

6.2.8 After discussion with the Trustee Company I have made the following financial assumptions in relation to the past service liabilities for this valuation:-

• Valuation rate of interest	4.5 per cent per annum
• Assumed rate of future salary inflation	3.6 per cent per annum
• Assumed rate of future pension increases	2.6 per cent per annum

6.2.9 For the purpose of determining past service liabilities, the assumed excess rate of the Scheme's investment return on current assets (after investment expenses) over that implied by Government Securities has been assumed to be nil. Clearly this is a conservative assumption, in that no allowance is made for any anticipated outperformance of the Scheme's investments. Any actual over or under performance would emerge as experience profit or loss at future valuations.

6.2.10 In deriving the assumptions to be used for assessing the normal contribution rate for future service, I have taken account of the fact that contributions will be invested on the terms applying at future dates which are not directly linked to market conditions at the valuation date. Further, the future service liabilities for which these contributions will be paid have a very much longer average duration

than the past service liabilities. It is therefore appropriate to allow for an investment return enhancement, above that implied currently by Government Securities.

6.2.11 The financial assumptions adopted in relation to the future service liabilities are as follows:-

• Valuation rate of interest	4.5 per cent per annum
• Additional investment return	1.0 per cent per annum
• Assumed rate of future salary inflation	3.5 per cent per annum
• Assumed rate of future pension increases	2.5 per cent per annum

6.2.12 It should be noted that the valuation rate of interest assumed is net of investment management expenses.

6.2.13 As at the 1996 valuation, a salary scale on account of age and promotion has been included in addition to the allowances above for general salary escalation. The allowance for pension increases is reduced appropriately in the case of Guaranteed Minimum Pensions.

6.2.14 It should be noted that pension increases in the Supplementary Section are discretionary. However the same allowance for pension increases has been made as for the Main Section.

6.2.15 The non-financial or demographic assumptions made in the valuation calculations include:-

- Average age of retirement of members in good health
- Rates of ill-health retirement
- Rates of mortality for active members in service, for deferred pensioners prior to retirement and for pensioners and spouses in receipt of benefits
- Proportion of members married

6.2.16 Two changes have been made to these assumptions since the 1996 valuation:-

- The allowance for ill-health retirements has been increased
- The mortality assumptions for deaths in retirement have been reduced

The changes in the assumptions mentioned above are considered in more detail in Section 7.

6.3 Valuation of Assets

6.3.1 On the market value approach the starting point for the asset valuation is the market value as shown in the Scheme accounts on the valuation date. This amounted to £18,815.3 million.

- 6.3.2** After making allowance for the estimated outstanding bulk transfer payment due from the NHSPS in respect of the Colleges of Nursing staff, I have taken the asset value of the Scheme as £18,869.6 million, see Section 5.2.
- 6.3.3** I consider the above method of valuation of assets to be consistent with my valuation of the liabilities.

6.4 Expenses

The Scheme is responsible for its administration costs and the current level of these costs is roughly 0.25 per cent of salaries based on the average level of expenses over the 3 year intervaluation period. I have therefore included a margin of 0.25 per cent of salaries in the calculation of the future service contribution rate disclosed in Section 8.1. The allowance included in the 1996 valuation of 0.2 per cent was understated.

Section 7 - Comment on Actuarial Assumptions

7.1 Financial Assumptions

7.1.1 As indicated in Section 6.2 the main financial assumptions adopted for the valuation of the liabilities are:-

- An excess rate of the Scheme's investment return (after investment expenses) over that implied by Government Securities of:-

a) Nil for benefits accrued in respect of past service

b) 1.0% per annum for benefits accruing in respect of future service and

- an excess rate of salary inflation over price inflation of 1.0% per annum for both past and future service.

7.1.2 These assumptions are considered reasonable for the purpose of funding the Scheme as at 31 March 1999.

7.2 Other Assumptions

7.2.1 Average Age of Retirement in Good Health

During the intervaluation period the average age of retirement in good health from active membership was 59.7. This compares with the assumption of age 60 used in the 1996 valuation.

Comment

I have retained the assumed average age of retirement as age 60 from the previous valuation. It should be noted that the Pension Schemes Office of the Inland Revenue would not normally allow advance funding to be made for early retirements occurring any earlier than this age.

7.2.2 Ill-Health Retirements

Experience during the intervaluation period was as follows:-

Expected number of ill-health retirements	383
Actual number of ill-health retirements	503

Comment

The experience of ill-health retirements over the period is greater than that expected on the basis of the 1996 assumptions. In fact the excess of "actual" over "expected" is due to the male ill-health experience; the female experience is actually slightly lighter than expected. I have therefore decided to increase the allowance for male ill-health retirements for this valuation in line with the 1996/99 experience.

7.2.3 Deaths in Service

Experience during the intervaluation period was as follows:-

Expected number of deaths in service	430
Actual number of deaths in service	232

Comment

Although the actual experience has again been lighter than expected, I have retained the standard assumptions which are based on national statistics, but already adjusted to some extent to reflect the lighter mortality experienced. The financial effect of varying this assumption would be relatively small compared to the effect of varying some of the other assumptions.

7.2.4 Deaths in Retirement

Experience during the intervaluation period in respect of retired members of the Scheme, including spouses, was as follows:-

Expected number of deaths in retirement	1,696
Actual number of deaths in retirement	1,649

Comment

At this valuation I have decided to reduce the mortality assumption, in the light of the experience above, and to allow for national trends. On the basis of the revised mortality assumptions the expected number of deaths over the intervaluation period was 1,566.

7.2.5 Withdrawals

Experience during the intervaluation period was as follows:-

Expected number of withdrawals	8,117
Actual number of withdrawals	18,549

Comment

It will be seen that the actual number of withdrawals exceeded the valuation allowance. The allowance for withdrawals was only introduced at the previous valuation of the Scheme.

In practice the Scheme makes a small gain from withdrawals. However, as all such gains may not arise (in particular due to the effect of participating in the Transfer Club) it was decided at the last valuation to introduce an allowance for only a proportion of the Scheme's withdrawal experience. Hence the difference between the actual and expected numbers above is to be expected.

I have not made any adjustment to the withdrawal assumption from that introduced previously.

7.2.6 Salary Scale

The salary structure of the membership shows a gradual increase in salary to reflect age and promotion.

Comment

The salary scale used was steepened at the previous valuation to (at least partially) reflect experience for 1993/96. I have again tested the salary scale against the intervaluation experience.

No further revision to the salary scale has been introduced at this time, but I recommend that this should be considered again at the next full valuation of the Scheme.

Section 8 - Valuation Results

8.1 Future Service Contribution Rate

- 8.1.1** Under the projected unit method, the normal contribution rate required from the Institutions for future service benefits is 16.3 per cent of salaries. This compares with the normal rate at the 1996 valuation of 14.6 per cent.

8.2 Past Service Position

- 8.2.1** The position is set out below, with a more detailed breakdown of the past service liabilities given in Appendix F. In addition, a comparison with the position at the previous valuation is shown:-

	1999 Valuation		1996 Valuation	
	£m		£m	
Value of assets		18,869.6		11,710.2
Less				
Value of liabilities				
- current beneficiaries	6,318.1		3,913.5	
- deferred pensioners	1,102.2		482.6	
- active members	10,006.5	17,426.8	6,459.5	10,855.6
Surplus (shortfall) of assets		1,442.8		854.6

- 8.2.2** The assets of the Scheme therefore total 108 per cent of the liabilities, the excess of assets over accrued liabilities being £1,442.8m. For comparison, in 1996 the assets also totalled 108 per cent of the liabilities, the excess of assets over accrued liabilities being £854.6m.

8.3 Supplementary Section

- 8.3.1** The assets and liabilities of the Supplementary Section are included in the above results. However, the Rules of the Scheme require the financial position of the Supplementary Section to be identified separately at the time of an actuarial valuation of the Scheme.
- 8.3.2** The value of the assets of the Supplementary Section is £183.9m, while the value of the past service liabilities is £107.7m. The Supplementary Section has therefore an excess of assets over liabilities of £76.2m.

- 8.3.3** The overall past service excess of assets of £1,442.8m is therefore deemed to consist of a past service excess of assets of £1,366.6m in respect of the Main Section and an excess of £76.2m in respect of the Supplementary Section.

8.4 Analysis of Valuation Results

- 8.4.1** At 31 March 1996 the Scheme had a past service excess of assets of £854.6m while the current valuation as at 31 March 1999 has disclosed a surplus of £1,442.8m.
- 8.4.2** The results of this valuation if I were to retain exactly the assumptions adopted for the 1996 valuation are set out in Appendix G. On these assumptions, there would be a past service deficit of assets below liabilities of £1,103.3m.
- 8.4.3** A reconciliation of the results of the 1996 and 1999 valuations, on the basis of the 1996 valuation assumptions, is given in Appendix H.

Section 9 - MFR, Solvency and Overfunding

- 9.1** I have performed calculations which look at the funding position of the Scheme in the event of it discontinuing. These calculations have been carried out on both the statutory minimum funding requirement basis and also on the basis that the Scheme would operate as a closed fund, with no further accrual of benefits after the valuation date.

9.2 Minimum Funding Requirement (MFR)

The Minimum Funding Requirement (MFR) basis was introduced by the Pensions Act 1995. If the funding position on the MFR basis falls below 100% funded, then a plan must be put into action to rectify the position over a 5 year period. If the Fund falls below 90% funded on this basis, then the position must be brought back up to the 90% level within one year and to the 100% level within 5 years. There are some transitional arrangements which can extend these five year and one year periods in some cases.

The liabilities under the MFR basis are the approximate cost of buying out benefits with an immediate annuity for pensioners and individual statutory minimum transfer values for non-pensioners. The MFR basis is prescribed which reduces the level of subjectivity required to calculate the figures.

The position at 31 March 1999 (allowing for the anticipated NHSPS bulk transfer) was:-

	£ million
Assets	18,869.6
Liabilities	13,528.4
Surplus	5,341.2
Funding level	139%

Actuarial statements as required by the Pensions Act 1995 are enclosed as Appendices I and J.

Being solvent on the MFR basis does not necessarily mean the Scheme will be solvent on an ongoing basis, or if the Scheme was wound-up. A prescribed allowance for the expenses of winding-up the Fund is also made, which may not be sufficient to cover expenses in an actual wind-up situation.

9.3 Closed Fund

Set out below is my estimate of the position at 31 March 1999 if benefits ceased to accrue on the valuation date and the Scheme was continued on a closed basis:-

	£ million
Assets	18,869.6
Liabilities	15,431.3
Surplus	3,438.3
Funding level	122%

For the purpose of these results I have assumed that active members at the valuation date would be entitled to deferred benefits. I have included a provision for the ongoing costs of administering the Fund of £300 million in the closed fund liabilities.

This is, of course, a "snapshot" of the position – the position might be very different if the Scheme were to close at a date in the future.

9.4 Overfunding Requirements

The Inland Revenue require the funding position of the Scheme to be assessed on a prescribed basis to ensure that it is not excessively funded. The surplus cannot exceed 5% of the liabilities on this prescribed basis without unfavourable taxation treatment being incurred.

The surplus as at 31 March 1999 measured on the prescribed basis does not exceed 5% of the liabilities and no corrective action needs to be taken. My certificate confirming the position is enclosed as Appendix K.

Section 10 - Recommendations

10.1 Summary of Results

10.1.1 The overall past service surplus of £1,442.8m represents 8.3 per cent of the past service liabilities of the Scheme. There is a surplus of £76.2m attributable to the Supplementary Section leaving a past service surplus of £1,366.6m in the Main Section.

10.1.2 The Institution contribution rate required for the future service benefits alone is 16.3 per cent of salaries.

10.2 Future Contributions

10.2.1 Based on the method and assumptions described in this report it has been agreed that the Institution contribution rate will be maintained at 14.0 per cent of salaries. To fund the reduction of 2.3 per cent below the Institution contribution rate of 16.3 per cent of salaries for the next 11 years will require the use of £561.3m of the Main Section surplus. This period of 11 years is the average outstanding working lifetime of the current members.

10.2.2 It has also been agreed that £201.0m of the surplus will be used to fund the following improvements in benefits:-

- removal of reductions to spouses' benefits on account of age disparity between husband and wife
- 1% special pension increase to all non-active members
- increase in lump sum death benefit from 2½ to 3 times salary

10.2.3 A past service surplus of £606.4m will be carried forward in the Main Section together with £74.1m in the Supplementary Section, i.e. a total past service surplus of £680.5m will be carried forward.

10.2.4 The contribution rate will be subject to review at the next actuarial valuation which would normally take place at 31 March 2002.

M B Reid
Fellow of the Institute of Actuaries
23 March 2000

Appendix A

Outline of Benefits and Contribution Structure at 31 March 1999

A.1 Eligibility

Employees of the Institutions on 1 April 1975 in academic, senior administrative and comparable occupations who were then members of the Federated Superannuation System for Universities (FSSU), the Teachers Superannuation Scheme (TSS), the National Health Service Superannuation Scheme (NHSSS) or a Local Government Scheme (LGS) were eligible to transfer to USS up to 5 April 1980.

Employees in the above category subsequently joining the pensionable service of an Institution are eligible to join USS provided they are not within five years of Normal Retirement Age, although the Trustee Company has power to waive this condition.

A.2 Definitions

(a) NORMAL RETIREMENT AGE means, for both male and female members, age 65.

(b) PENSIONABLE SERVICE is broadly the time during which a member has been engaged in academic or similar employment with an Institution and may include periods of service before the start of USS. Pensionable service is, however, limited to a maximum of forty years.

An employee who transferred before 29 August 1992 from employment in an Institution other than academic or related employment had service in such employment counted in USS on a year-for-year basis.

An employee who transferred before 6 April 1980 from FSSU, TSS, NHSSS or a LGS had pensionable service in that scheme transferred to USS on a year-for-year basis.

(c) SCHEME SERVICE is the total period of Pensionable Service which the member would have completed if the member had remained in the employment of the Institution until Normal Retirement Age.

(d) SALARY is the total annual fixed salary of the member, but subject to the Finance Act 1989 cap for those joining the Scheme after 31 May 1989. With the agreement of the Trustee Company, the Institution can determine that fixed allowances or fluctuating emoluments be included in Salary.

(e) PENSIONABLE SALARY is normally the member's highest Salary, as defined above, received for a period of twelve months during the last three years before Normal Retirement Age or before leaving service (whichever is the earlier) or, if greater, the highest yearly average of the member's total Salary for any three year period ending in the last ten years. For this purpose, Salary for any year, except the last before the date of calculation, is increased in proportion to the rise in the Index of Retail Prices from the last day of that year up to the date of calculation.

A.3 Contributions

Members pay contributions at the rate of 6.35 per cent of Salary. Members may, within certain limits, pay additional voluntary contributions in order to secure additional benefits. Members cease contributions on reaching Normal Retirement Age or completing forty years' Pensionable Service, whichever occurs first, provided that if the member has not completed forty years' Pensionable Service at Normal Retirement Age and remains in

service, contributions may be continued so as to provide further benefits on actual retirement.

The balance of the cost of the benefits is met by the Institutions which pay such rate of contribution as the Actuary recommends to be appropriate. This has been 14.0 per cent of Salaries since 1 January 1997.

A.4 Pension payable on Normal Retirement

On retirement at Normal Retirement Age, or after age 63½, a pension is payable to the member at the rate of one-eightieth of Pensionable Salary for each year of Pensionable Service with allowance for completed days.

A.5 Retirement before Normal Retirement Age because of Ill-Health or Incapacity

On such retirement, provided two years' Pensionable Service has been completed, a member is normally entitled to an immediate pension calculated as one-eightieth of Pensionable Salary for each year of Scheme Service.

If an ill-health withdrawal takes place after less than two years' Pensionable Service has been completed then the member is entitled to normal leaving service benefits as outlined in paragraph A.14.

A.6 Retirement before Normal Retirement Age on grounds other than Ill-Health or Incapacity

A member who has reached age 50 and completed five years' Pensionable Service and who retires before Normal Retirement Age either at the request of the employing Institution or on account of redundancy or a member who has reached age 60 and completed five years' Pensionable Service and who retires with the consent of his Institution receives an immediate pension. The amount of the pension is one-eightieth of Pensionable Salary for each year of Pensionable Service up to the date of retirement.

A.7 Retirement after Normal Retirement Age

On retirement after Normal Retirement Age a member is entitled to the pension which would have been received at Normal Retirement Age, increased by such an amount as the Trustee Company, acting on actuarial advice, decides is appropriate.

A.8 Lump Sum Benefits on Retirement

On retirement on pension a lump sum retirement benefit also becomes payable. The usual scale for this benefit is three times the annual amount of the pension. A member may request that a higher or lower amount should be payable, in which case the member's pension is reduced or increased appropriately.

A.9 Lump Sum Benefits on Death in Service

On the death of a member in service before Normal Retirement Age a lump sum is payable equal to two and a half times the Salary being paid to the member at the date of death.

A.10 Spouses' Pensions payable on Death in Service

On the death of a member, a spouse's pension is payable at the same rate as the deceased member's Pensionable Salary at the date of death but reducing after three months' payments have been made to one-half of the pension which would have been payable had the member retired because of ill-health on the day before the death.

The pension is payable until the death of the spouse. Where the member does not leave a spouse, the Trustee Company has discretion to pay the pension to a dependant.

Where the beneficiary is more than fifteen years younger than the deceased member (ten years in the case of members who left active service before 1 April 1997), the pension is reduced unless the Trustee Company at its discretion decides otherwise.

A.11 Spouses' Pensions payable on Death after Retirement

On the death of a member after retirement whilst in receipt of a pension leaving a spouse, a spouse's pension is payable at the same rate as that previously payable to the member (before any reduction because of an allocation to provide an additional dependant's annuity) but reducing to one half that amount (before any adjustment because of a conversion of pension for lump sum or vice versa at retirement) after three months' payments have been made. The pension is payable until the spouse's death. Where the member does not leave a spouse, the Trustee Company has discretion to pay the pension to a dependant.

Where the beneficiary is more than fifteen years younger than the deceased member (ten years in the case of members who left active service before 1 April 1997), the pension is reduced unless the Trustee Company at its discretion decides otherwise.

A.12 Children's Allowances on the Death of a Member before or after Retirement

In addition to spouses' pensions, children's allowances are payable in respect of each qualifying child subject to a maximum of two (as defined in the rules) on the death of a member in service. The children's allowance for each qualifying child is calculated at the rate of three-eighths of the pension that would have been payable to the member on ill-health retirement on the day before the death. Where, however, there is no spouse's pension payable then the rate of the children's allowance is one-half instead of three-eighths of the corresponding member's pension.

When a member dies after retirement, children's allowances are payable at the same rates as apply for a member dying in service, as described above, except that reference to the member's ill-health pension is to be taken as referring to the member's actual pension (before any adjustment because of a conversion of pension for lump sum or vice versa at retirement or because of the provision by allocation of an additional dependant's annuity).

A.13 Lump Sum Benefits Payable on Death after Retirement

On the death of a pensioner there is a lump sum payable normally calculated as the excess, if any, of the amount payable if the member had died in service less, except in the case of ill-health retirees, the actual amounts received by the member by way of pension and lump sum retirement benefits.

A.14 Benefits on Leaving Service

Where a member withdraws from service before Normal Retirement Age without becoming entitled to an immediate pension but having completed two years' qualifying service, the member will be entitled to a deferred pension payable from Normal Retirement Age. This is calculated as one-eightieth of Pensionable Salary for each year of Pensionable Service to the date of leaving. There will also be a lump sum payable at eventual retirement on the scale set out in paragraph A.8.

A member who leaves with less than two years' qualifying service may take a refund of contributions plus interest subject to certain deductions. Alternatively, such a member may elect to take a deferred pension and lump sum retirement benefit equal in value to the contributions, with interest, less the member's share of the cost of the Contributions Equivalent Premium which is payable to the State.

On the death of a former member with a deferred pension before the pension starts to be paid, a lump sum of three times the annual rate of the deferred pension is payable, together with a spouse's pension, if applicable, of one-half of the amount of the deferred pension and children's allowances calculated by the same method as for a member who continues in service. In such a case, once the pension has started to be paid, benefits will be payable on the scales set out in paragraphs A.11, A.12 and A.13.

In lieu of the benefits described above, the Trustee Company is able to pay a transfer value to another pension scheme which is empowered to accept such transfers or a "buy-out" policy issued under the provisions of Section 591(2)(g) of the Income and Corporation Taxes Act 1988 or a personal pension scheme.

A.15 Premature Retirement Terms

In accordance with Rule 8.2(g) an employer may pay additional contributions in order to grant a member additional benefits on premature retirement. The additional contribution is determined in accordance with tables approved by the Trustee Company.

A.16 Pension Increases

Pensions in payment from the Main Section of the Scheme (see A.18 below) and in the period of deferment and annuities are increased in line with the provisions of the Pensions (Increase) Acts as modified by the Social Security Pensions Act 1975. Pensions in payment from the Supplementary Section of the Scheme have in practice been increased to the same extent.

A.17 Pension Schemes Act 1993

From 6 April 1978 to 5 April 1997, the members of USS have been contracted-out of the State Earnings-Related Pension Scheme (SERPS). As a consequence the appropriate benefits are guaranteed to be not less than the Guaranteed Minimum Pension (GMP) or the spouse's GMP as the case may be. With effect from 6 April 1997 members have been contracted-out on the Reference Scheme Test basis.

As the State Pension Scheme will pay all or part of the pension increases (as provided for under the legislation) on both the GMP and the spouse's GMP, the pension increases required in USS under the Pensions (Increase) Acts will be correspondingly reduced.

A.18 Main and Supplementary Sections

The levels of benefits described above are the total benefits from the Scheme. The principal benefits are provided under the Main Section whilst the Supplementary Section provides additional benefits payable when a member retires on the grounds of ill-health or incapacity or dies in service. From the member's contribution of 6.35 per cent of Salary (referred to in paragraph A.3) 6 per cent is paid to the Main Section and 0.35 per cent to the Supplementary Section. The whole of the contributions payable by the Institutions is paid to the Main Section.

Appendix B

Summary of Membership

B.1 Active Members

		At 31.3.99		At 31.3.96
	Numbers	Annual Salaries (£)	Numbers	Annual Salaries (£)
Males	52,962	1,656,769,505	51,691	1,489,774,030
Females	28,631	696,521,111	22,938,	519,539,126
Total	<u>81,593</u>	<u>2,353,290,616</u>	<u>74,629</u>	<u>2,009,313,156</u>

B.2 Current Beneficiaries

		At 31.3.99		At 31.3.96
	Numbers	Annual Pensions (£)	Numbers	Annual Pensions (£)
Male pensioners	19,960	319,088,292	16,331	230,213,000
Female pensioners	4,527	47,622,616	3,388	32,114,500
Male dependants	196	1,037,516	115	505,130
Female dependants	4,424	33,812,633	3,382	22,539,730
Children's allowances	696	2,849,038	702	2,317,840
Total	<u>29,803</u>	<u>404,410,095</u>	<u>23,918</u>	<u>287,690,200</u>

B.3 Deferred Pensioners

At 31 March 1999 there were 37,991 former members entitled to deferred pensions (31 March 1996 : 27,470). The total annual deferred pensions were £70,188,773 (31 March 1996 : £49,599,041).

Appendix C

Distribution of Assets

The accounts indicate that the market value of the assets of the Scheme as at 31 March 1999 was £18,815.3m. A breakdown of this amount by investment category, together with the corresponding details as at 31 March 1996, is as follows:-

	Market Value 31.3.99		Market Value 31.3.96	
	£m	%	£m	%
Fixed Interest	1,433.4	7.6	1,062.6	8.8
Index Linked	216.2	1.2	270.3	2.2
Equities				
- UK	11,703.4	62.2	6,430.3	53.2
- Overseas	3,376.7	18.0	2,581.3	21.4
Property	1,174.5	6.2	782.6	6.5
Life Assured Policies	263.8	1.4	276.7	2.3
Managed Fund	0	0	78.4	0.6
Loans and Deposits	492.0	2.6	465.4	3.9
Stockbroker Balances	26.4	0.1	26.5	0.2
Net Current Assets	128.9	0.7	112.6	0.9
Totals	18,815.3	100.0	12,086.7	100.0

Appendix D

Income and Expenditure

		Year Ending:-		
	31.3.97	31.3.98	31.3.99	Totals
INCOME	£m	£m	£m	£m
Fund at beginning of period	12,086.7	13,668.5	17,350.8	12,086.7
Institutions' contributions	358.7	305.7	321.7	986.1
Members' contributions - basic	124.2	130.8	137.9	392.9
- AVCs	11.1	12.4	13.5	37.0
- Supplementary Section	7.3	7.6	8.0	22.9
PRCS receipts	46.2	55.5	41.4	143.1
Transfers from other schemes	30.8	90.7	67.9	189.4
Investment Income	509.3	499.3	505.2	1,513.8
Net increase(decrease) in market value during the period	930.6	3,062.4	882.0	4,875.0
Totals	<u>14,104.9</u>	<u>17,832.9</u>	<u>19,328.4</u>	<u>20,246.9</u>
EXPENDITURE	£m	£m	£m	£m
Benefits - pensions	312.9	347.9	384.2	1,045.0
- retirement lump sums	84.7	97.1	83.4	265.2

- death in service lump sums	4.9	6.3	7.1	18.3
- refunds	0.7	1.0	1.1	2.8
Transfers to other schemes	21.8	18.1	21.8	61.7
Payments for member joining state scheme	0.8	0.5	0.4	1.7
Administration costs	5.8	5.9	6.4	18.1
Investment management expenses	4.8	5.3	8.7	18.8
Fund at end of period	13,668.5	17,350.8	18,815.3	18,815.3
Totals	<u>14,104.9</u>	<u>17,832.9</u>	<u>19,328.4</u>	<u>20,246.9</u>

Appendix E

Actuarial Assumptions adopted for the 1996 Valuation

The principal financial assumptions were as follows:-

Valuation rate of interest	8.5% p.a.
Assumed rate of future salary inflation	6.5% p.a.
Assumed rate of future pension increases	5% p.a.
Assumed rate of future increases in dividends	4.5% p.a.
Assumed rate of future increases in property rents	1.5% p.a.
Assumed rate of future increases to index-linked proceeds	5% p.a.

The value of the Scheme's assets was assessed by discounting, at the valuation rate of interest, the expected income and redemption proceeds generated by the investments held. Allowance was made, where appropriate, for future growth in income. The main asset classes were valued as follows:

Equities and Managed Fund:	Market value notionally invested in the FT Actuaries' All Share Index and dividends assumed to increase at the rate of 4.5% per annum and then discounted at the valuation rate
Index Linked:	Interest and redemption proceeds assumed to increase at the rate of 5% per annum and then discounted at the valuation rate
Fixed Interest:	Interest and redemption proceeds discounted at the valuation rate
Property:	Property rents assumed to increase at the rate of 1.5% per annum and then discounted at the valuation rate
Life Assurance Policies:	Balance sheet value notionally invested in a spread of asset types as notified by the Equitable Life and each asset type valued as above

Appendix F

Analysis of Past Service Liabilities

	£m
Present value of :-	
Benefits in respect of current beneficiaries	6,318.1
Benefits in respect of deferred pensioners	1,102.2
Benefits in respect of current active members:-	
• Pensions payable on retirement and lump sums payable on death in retirement	7,119.4
• Lump sums payable on retirement	1,155.6
• Spouses' and dependants' pensions payable on death in service	138.5
• Spouses' and dependants' pensions payable on death in retirement	917.8
• Withdrawal benefits	512.0
Liabilities for Colleges of Health transfers	163.2
Total past service liabilities	17,426.8

Appendix G

Results and analysis on 1996 basis

Using exactly the method and assumptions adopted for the previous valuation, the valuation results would be as follows:-

The value placed on the Scheme assets is £12,250.4 million. This compares to a market value, including allowance for the outstanding NHS bulk transfer, at the valuation date of £18,869.6 million.

The value of the assets of the Supplementary Section included in the above actuarial value is £119.4 million.

The value of the accrued liabilities totals £13,353.7 million made up as follows:-

	£ million
Benefits in respect of current pensioners	5,232.1
Benefits in respect of deferred pensioners	732.2
Benefits in respect of current active members	7,389.4
Total accrued liabilities	£13,353.7

These accrued liabilities are split between the Main Section and the Supplementary Section as follows:-

	£ million
Main Section	13,269.4
Supplementary Section	84.3

The assets of the Scheme therefore total 92 per cent of the liabilities, the excess of accrued liabilities over assets being £1,103.3 million. Of this, the Supplementary Section has excess assets over accrued liabilities of £35.1 million.

Appendix H

Reconciliation of 1999 valuation results (on the 1996 assumptions) with the 1996 valuation

			£m
Past service surplus at 31 March 1996		+	855
Interest on surplus		+	200
Benefit improvements		-	100
Investment returns below assumptions (due mainly to lower than expected growth in dividends from equities)		-	2,000
Effect of loss of tax credits		-	800
Inflation			
- salary inflation below assumptions	+ 300		
- pension increases below assumptions	+ 250		
		+	550
Impact of Institutions' contributions actually paid		+	50
Other items		+	142
Past service deficit of assets below liabilities at 31 March 1999 (assessed on the 1996 valuation assumptions)		-	<u>1,103</u>

The normal contribution rate, payable by the Institutions, required to fund future service benefits on the Projected Unit Method would be 14.6 per cent of salaries. This is made up as follows:-

	%
Cost of benefits accruing to active members in the year following the valuation date	20.1

Plus Expenses	0.25
Plus Cost of lump sum death in service benefits	0.60
less Normal Employee contributions	6.35
	<u>14.6</u>
This compares with the rate of 14.6% quoted in the 1996 valuation.	

If the past service deficit were to be cleared by the payment of additional contributions over the next 11 years, the addition to the contribution rate would be 4.8% per annum, leading to a net rate of 19.4% per annum. This period of 11 years is the average outstanding working lifetime of current members.

It should be noted that the normal contribution rate of 14.6% makes no allowance for the effect of the loss in tax credits introduced in the 1997 Budget. If the assumed investment return for future service was reduced by 0.25 per cent per annum on account of this, the normal contribution rate would increase to 15.8%. The effect of the Budget on the past service position of the Scheme is allowed for in the above results.

The results set out above also make no allowance for the increase in the ill-health assumption mentioned in paragraph 7.2.2 or the reduction in mortality assumption mentioned in paragraph 7.2.4. Allowing for these changes would act to increase the past service liabilities by £128.8 million, and increase the normal contribution rate by 0.4%.

Taking into account the loss of tax credits for future service, the increase in the ill-health assumption and the reduction in mortality, would produce the following revised results on the 1996 valuation approach:-

Value of assets	£12,250.4m
Value of past service liabilities	£13,482.5m
Past service deficit	£1,232.1m
Normal contribution rate for future service	16.2%

Appendix I

Actuarial Statement made for the purposes of Regulation 14 of the Occupational Pension Schemes (Minimum Funding Requirement and Actuarial Valuations) Regulations 1996

Name of Scheme: Universities Superannuation Scheme
Effective Date of Valuation: 31 March 1999

1. Compliance with minimum funding requirement

In my opinion, on the effective date the value of the assets of the Scheme exceeds 120% of the amount of the liabilities of the Scheme.

2. Valuation principles

The Scheme's assets and liabilities are valued in accordance with section 56(3) of the Pensions Act 1995, the Occupational Pension Schemes (Minimum Funding Requirement and Actuarial Valuations) Regulations 1996 and the mandatory guidelines on minimum funding requirement (GN27), prepared and published by the Institute of Actuaries and the Faculty of Actuaries.

Signature: Date of signing: 23 March 2000

Name: M B Reid Qualification: FIA

Address: William M Mercer Limited
30 Exchange Street East
Liverpool
L2 3QB

Note:

The valuation of the amount of the liabilities of the Scheme does not reflect the cost of securing those liabilities by the purchase of annuities, if the Scheme were to have been wound up on the effective date of the valuation.

Appendix J

Actuarial Statement made for the purposes of Regulation 30 of the Occupational Pension Schemes (Minimum Funding Requirement and Actuarial Valuations) Regulations 1996

Name of Scheme: Universities Superannuation Scheme
Effective Date of Valuation: 31 March 1999

1. Security of prospective rights

In my opinion, the resources of the Scheme are likely in the normal course of events to meet in full the liabilities of the Scheme as they fall due. In giving this opinion, I have assumed that the following amounts will be paid to the Scheme:-

Description of contributions:

By the Employer: 14% of Salary

By the Members: 6.35% of Salary

Subject to review at future actuarial valuations.

2. Summary of methods and assumptions used

Further details of the methods and assumptions used are set out in my actuarial valuation addressed to the Trustee Company dated 23 March 2000.

Signature:.....	Date of signing: 23 March 2000
Name: M B Reid	Qualification: FIA
Address: William M Mercer Limited	
30 Exchange Street East	
Liverpool	
L2 3QB	

Appendix K

Certificate

This certificate is given to the Commissioners of Inland Revenue for the purposes of paragraph 2(3) of Schedule 22 to the Income and Corporation Taxes Act 1988.

Name/Description of Scheme: Universities Superannuation Scheme

Inland Revenue Reference No: SF21/1526

I hereby certify that:-

(1) In my opinion as at 31 March 1999 the value of the assets of the scheme did not exceed 105% of the value of the liabilities of the scheme;

(2) The assets and liabilities to which paragraph (1) refers have been determined in accordance with principles and requirements prescribed by the Pension Scheme Surpluses (Valuation) Regulations 1987.

Signature: Date of signing: 23 March 2000

Name: M B Reid Qualification: FIA

Address: William M Mercer Limited
30 Exchange Street East
Liverpool
L2 3QB