



THE LONDON SCHOOL  
OF ECONOMICS AND  
POLITICAL SCIENCE ■

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**Professor Craig Calhoun**  
Director

3 December 2014

Dear Nicola,

I refer to the consultation exercise on the Technical Provisions and Recovery Plan which closed on Friday 28 November 2014. I am sending with this letter the LSE contribution to the discussion, though I recognize that it is late. If its lateness will prevent it being seen by the relevant authorities at USS, please let me know so that I can submit it directly to them.

Our response was formulated by the LSE Pensions Advisory Group. This brings together individuals who collectively have the expertise to provide detailed comments on such issues. I have reviewed their report and together with other members of the School's management, endorse it as the LSE's official comment. It reflects a genuine concern among our USS staff and that of management at the School.

I am aware that sensitive negotiations are pursuing at national level and hope that you will be able to share as appropriate the School's current position.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Craig', written over a horizontal line.

**Professor Craig Calhoun**  
Director and President

**Response by the London School of Economics Pensions Advisory Group to USS Consultation on Technical Provisions and Recovery Plan**

Here, as requested, are our comments on "the underlying assumptions which will be used to complete the formal valuation and more broadly the trustee's approach as set out in the Statement of Funding Principles."<sup>1</sup> The views expressed are those of the LSE's Pensions Advisory Group.

The Group accepts that the scheme is facing an important challenge and that there is a need to find an equitable and stable solution. We are also clear that suggesting alternative valuation assumptions is not by itself a solution and needs to be supplemented with further measures.<sup>2</sup> We would, however, like a solution to be founded on assumptions that reflect the genuine funding realities of the pension scheme. We find unconvincing the explanations of some of these assumptions and would welcome indications of why other options were rejected or not considered.<sup>3</sup>

We begin by noting that we share the concerns about the valuation assumptions that have been voiced by the professors of statistics, financial mathematics, and actuarial science (hereafter 'the statisticians') in their letter to the Trustee, which we have attached as an appendix to this letter.

We regard the following observation of the statisticians as especially telling:

"...moving to evidence-based assumptions on salary growth and RPI would show the scheme to be in healthy surplus on a neutral assumptions basis. Remove the de-risking assumptions and that surplus would be substantial. Substitute historic asset growth performance for Gilts plus and the neutral basis would show a very substantial surplus."

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<sup>1</sup> "2014 Actuarial Valuation: A consultation on the proposed assumptions for the scheme's technical provisions and recovery plan", USS, October 2014 (hereafter "AV"). These comments also take account of "USS: Consultation on Technical Provisions and Recovery Plan", UUK cover note, 4 November 2014. We regret that our Pensions Advisory Group did not receive a further UUK cover note of 21 November 2014 in time to make use of it by your noon 28 November deadline.

<sup>2</sup> The Group will be issuing a further statement at a later date, which addresses wider issues of pensions reform that fall outside of the remit of this technical consultation.

<sup>3</sup> A number of other assumptions need to be reconsidered. For example, it is said that allowing for commutation would have no effect on the deficit. This argument needs to be justified.

In other words, the assets exceed the liabilities on a neutral or best estimate – which is to say an estimate that is neither pessimistic nor optimistic – of the value of the pension fund. It now becomes difficult to see how anything other than an "overly prudent"<sup>4</sup> series of pessimistic departures from genuinely neutral assumptions regarding the valuation of the liabilities could transform such a surplus into the £12.3 billion deficit that is reported in the draft valuation results, although it is noted that this £12.3 billion is on a technical basis.<sup>5</sup> Such departures also overestimate the cost of contributions for future service of pensions benefits.<sup>6</sup> These departures seem to go too far, especially given that the Ernst and Young investigation of the strength of the covenants in a sample of universities found that they were robust.<sup>7</sup> Given the multiple objectives of pension schemes, the degree of prudence should be optimised not maximised. We therefore ask what would an appropriately, as opposed to an overly, prudent adjustment of such a neutral best estimate be?

In answering this question, we note first that UUK's advisor Aon Hewitt has advised UUK that "the current Statement of Funding Principles ... states that, other than the discount rate, and longevity assumptions, all assumptions will be chosen on a 'best estimate' basis."<sup>8</sup> Hence, by the Trustee's current principles, there should be no quarrel with the statisticians' introduction of "evidence-based assumptions on salary growth and RPI". If there is any dispute between the statisticians and the Trustee here, it will need to be narrowed down to the question of what is the *best estimate* of salary growth and RPI.

INFLATION. With regard to the Trustee's estimation of the rate of RPI itself, we are reliably informed that economists and others who are expert on this matter regard 3.4% as too high rather than the best available estimate of RPI. Such a forecast for RPI would be the best estimate only if the best estimate of the gap between CPI and RPI were about 0.5% greater than the AV consultation document's assumed gap of 0.8%-1.0% (the accuracy of which has been confirmed by the advice we have received). We also note that if the larger gap that would be necessary to justify a 3.4% RPI is assumed, then UUK's proposed cuts to pensions will be exacerbated, given the manner in which revaluation is tied to CPI.

SALARY GROWTH. With regard to salary growth, we concur with the statisticians' conclusion that RPI + 1% is unsupported, given the historical data to the contrary. We also note that general pay growth along these lines is unrealistic when looking forward, since there is little prospect for

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<sup>4</sup> <http://www.thepensionsregulator.gov.uk/press/pn13-17.aspx>

<sup>5</sup> AV, table C.2.

<sup>6</sup> AV, tables C.2 and C.5.

<sup>7</sup> "Scheme Funding within USS: an engagement with Universities UK", USS, December 2013.

<sup>8</sup> "USS: Consultation on Technical Provisions and Recovery Plan", UUK cover note, 4 November 2014.

RPI + 1% increases in revenue for the pre-92 higher education sector as a whole during the next Parliament. The unreality becomes especially vivid when RPI + 1% is combined with the assumption that RPI itself will be 3.4%. Our employers could nevertheless make such assumed salary growth come true by awarding increases of 4.4% per annum (or its long run equivalent) for the next several years. If, therefore, UUK does not challenge this assumption, but later refuses to award such pay increases because, as they must now foresee, they will deem them unaffordable, then employees will feel hard done by their employers twice over: first for accepting an assumption that forced cuts to their pensions, and second for failing to deliver the assumed pay increases. If, as we believe, our employers are not prepared to start awarding 4.4% pay increases, then honesty requires that UUK should request the USS trustees to revise their assumption of salary growth downward.

Given a best estimate of salary growth and RPI, what would constitute a reasonably prudent adjustment of the other assumptions? In particular, what would constitute a reasonably prudent adjustment to the discount rate?

DISCOUNT RATE AND DE-RISKING. The most fundamental assumption about the discount rate is that valuation is based on the "gilts plus" method, though the Pensions Regulator is also willing to entertain a methodology based on actual asset holdings. The latter methodology is also expected to be prudent. As we understand it the "gilts plus" method is favoured by actuaries as the most prudent method. The preference for using this method needs justification in the light of a robust covenant as does the one percent prudent deduction from gilts' returns as used in the valuation.

Bound up with this question is the extent to which USS should de-risk its investments – an investment strategy which has been justified on grounds of prudence and which also lowers the discount rate. In its 22 October 2014 submission to the JNC, UUK wrote that it "recognized the need for some investment de-risking, principally to respond to the increasing reliance which the scheme will otherwise place on the sector over time, and to help in reducing funding (and contribution) volatility." AV similarly states that "The trustee's plan to reduce risk within the scheme would, over the long term, deliver increased contribution stability enabling some confidence that contributions would not become unaffordable". We would like to make the following points regarding de-risking and the discount rate:

1. De-risking is an ineffective strategy for keeping contributions affordable, since it increases the need and demand for an increase in contribution rates in order to avoid reductions in the income that retirees receive from their pensions. It is also important to realize that the level of

the employer contribution rates does not necessarily capture the full effects on employers of de-risking, as academics with international mobility are likely to expect salary compensation in the form of higher pensionable salary to counteract the effects of pension reduction arising from reforms to USS.

2. Insofar as funding and contribution volatility are concerned, it would seem a more rational response, as suggested above, to set a prudent discount rate in a manner that accurately reflects the actual mixture of return-seeking and other investments – namely, 'best estimate minus' – rather than to de-risk investments into a mixture that more closely approximates gilts.<sup>9</sup> We are perplexed by the intransigence of the Trustee in sticking to gilts-plus in the face of the sound arguments to the contrary that have been offered in the exchange of technical letters with UCU.<sup>10</sup>

3. USS claims that their de-risking strategy is justified on grounds that gilts provide a good match to the liabilities of the pension scheme and hence constitute a liability-hedging asset. However "there are no assets that perfectly match pension liabilities (except for purchasing annuities where the insurer takes all the risk instead). Pension liabilities move with salary inflation (no matching asset), lpi [i.e., limited price indexation] (no matching asset), have long duration (no properly matching asset) and longevity (no matching asset). Therefore, trying to use bonds to 'match' pension liabilities is doomed to underperform the liabilities themselves."<sup>11</sup> There are, of course, many other methods of de-risking and it would be helpful to know why these were rejected and why given the assumption of continuing low discount rates this therefore expensive method of de-risking was chosen.

4. Funding and contribution volatility are, in significant part, a function of how volatile the deficit is. The existence and volatility of the deficit, however, is an artefact of assumptions regarding salary growth and RPI that fail to provide best estimates of these factors. (See above discussion.) Once, therefore, assumptions regarding salary growth and

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<sup>9</sup> "I close with an appeal to the profession to stop using the gilt yield + x% method of setting the discount rate for a valuation. To tell trustees that their scheme is 100 percent funded and then say it is 60 percent funded a short while later, using a method represented as reflecting the actual assets of the scheme, risks bringing the profession into disrepute. It is time to move away from this method which has no sound rationale and instead use methods that have a real-world interpretation, fit better with the Pensions Act 2004 and provide a firm basis for advice." (Derek Benstead, "Pensions: The going rate", <http://www.theactuary.com/archive/old-articles/part-6/pensions-3A-the-going-rate/> )

<sup>10</sup> [http://www.ucu.org.uk/circ/pdf/UCUHE231\\_att1.pdf](http://www.ucu.org.uk/circ/pdf/UCUHE231_att1.pdf)  
[http://www.ucu.org.uk/circ/pdf/UCUHE231\\_att2.pdf](http://www.ucu.org.uk/circ/pdf/UCUHE231_att2.pdf)  
[http://www.ucu.org.uk/circ/pdf/UCUHE231\\_att3.pdf](http://www.ucu.org.uk/circ/pdf/UCUHE231_att3.pdf)

<sup>11</sup> Ros Altmann, private correspondence with the Pensions Advisory Group. (Altmann is an authority on pensions as well as a member of LSE's Court of Governors.)

RPI are corrected to conform to the evidence, the volatility-based argument for de-risking substantially decreases.

Speaking more generally, it is widely accepted that one of the main advantages of a large defined benefit pension scheme such as USS is provided by the pooling of investment risks, which allows for the reaping of high returns on investment in an efficient but prudent manner over a long period of time, by smoothing over variations above and below the expected returns on return-seeking assets.<sup>12</sup> The de-risking strategy would therefore defeat a key purpose of a defined benefit scheme.

THE RECOVERY PERIOD. We note that the AV consultation document reports that "there is good visibility regarding the robustness of the covenant over a 20 year time horizon; beyond which visibility is reduced although *the expectation is that the covenant will remain robust*" (emphasis added). The Pension Regulator has also indicated that longer periods than the usual ten years may be allowed where the covenant is strong. More generally, the regulator is willing to allow somewhat more optimistic estimates in recovery plans. In the light of these facts, we do not think there should be any doubt regarding the adoption of a recovery period of at least 20 years. The Trustee's recommendation of a 15 year recovery period is, we think, another instance of "over-prudence".

CONCLUDING REMARKS. According to the Pensions Regulator's Code, "The trustees' key objective is to pay promised benefits as they fall due."<sup>13</sup> In meeting this key objective, trustees and employers must not lose sight of the *reason why* it would be bad to fail to make good on promised pension benefits: because employees would be made significantly worse off on account of shortfalls in their income in retirement. We believe, for the reasons offered above, that the proposed de-risking of investments and the assumptions underlying the valuation of the liabilities of the fund have lost sight of this objective. We therefore urge "trustees and employers to use the flexibilities in the funding regime and work collaboratively" towards the achievement of a solution that will result in far less of a reduction in pension income than UUK has proposed.<sup>14</sup>

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<sup>12</sup> As Ros Altmann notes: "USS is a different type of scheme from most of those in the private sector, because it is an open scheme. The private sector schemes are now almost all closed (at least to new members), which means that they are in run-off and have a shorter time horizon than an open ongoing scheme. This should allow a longer-term investment perspective for the asset allocation and assumed returns." (ibid.)

<sup>13</sup> "Code of practice no. 3: Funding defined benefits", the Pensions Regulator, July 2014, para 22.

<sup>14</sup> Quotation from the statement of purposes, ibid., p. 7.

Sir Martin Harris  
Chairman of the Trustee Board  
Universities Superannuation Scheme  
Royal Liver Building  
Liverpool  
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Dear Professor Harris, Members of the USS Trustee Board

### **Estimating the USS pension fund deficit**

We are writing as professors of statistics, financial mathematics or actuarial science. Our primary expertise is in the evaluation and modelling of data, for which the quantification of uncertainty and the critical appraisal of model assumptions are central.

We are writing to express serious concerns about the assumptions underpinning the estimation of the USS pension fund deficit, as detailed in the Oct 2014 document 'USS: 2014 Actuarial Valuation: A Consultation on the proposed assumptions...' (henceforth 'the AV consultation'). For each of our concerns the difference between what is assumed and what we believe to be reasonably justified (on the basis of available information) might appear relatively small (1 percent here, fractions of a percent elsewhere). Nevertheless, as you are well aware, it is in the nature of compound interest and discounting calculations that such changes of a few percent can jointly and cumulatively produce very substantial changes in the estimated state of a fund. The table in section C.5 of the AV consultation makes these sensitivities very clear.

Our concerns are as follows:

1. The Gilts plus method of estimating future investment returns represents an unduly pessimistic assumption which is substantially out of line with what USS has managed historically. It is clearly not prudent to change the basis of the valuation merely because the resulting outcome is uncomfortable: but this observation is not a justification for sticking with a valuation method and assumptions for which the underlying model has ceased to be reliable. This must be the case for a Gilts based valuation in the aftermath of quantitative easing by the Bank of England. We also note that the Pensions Regulator does not mandate the use of the Gilts plus approach and considers methodology based on actual asset performance to be perfectly acceptable, as is made clear by point 125 p.35 of:  
<http://www.thepensionsregulator.gov.uk/docs/code-03-funding-defined-benefits.pdf>.
2. The market derived inflation assumptions appear unduly high relative to the historical RPI record or the Bank of England CPI target of 2%. This high rate has been achieved by assuming an exceptionally low inflation risk premium (0.2% dropping to 0.1%), which is much lower than empirical estimates, and by ignoring the depressed state of yields on index-linked gilts related to supply issues. See for example the survey of empirical estimates in [http://www.gla.ac.uk/media/media\\_293624\\_en.pdf](http://www.gla.ac.uk/media/media_293624_en.pdf), (p12-13). The Bank of England estimates <http://www.bankofengland.co.uk/research/Documents/workingpapers/2009/wp360.pdf>, also discusses how pension fund de-risking may be driving down Gilt yields. An especially good statement of the topic is provided in <http://www.boi.org.il/en/DataAndStatistics/Pages/InflationExpectationsExplanation.aspx> Further discussion is provided in the appendix,
3. The assumed basic rate of salary growth (i.e. before accounting for progression and promotion) of RPI + 1% is much higher than has been achieved historically (See figure below.). A growth rate matching RPI is what has been achieved since 1990. Had RPI+1% occurred since 1990, academic salaries would now be 25% higher than they are. Clearly this leads to an overstatement of future liabilities.

4. We are concerned that the assumption of an increase in the rate of increase of longevity has been made without supporting data. Indeed CMI2012 reports a *reduction* in expected lifespans relative to CMI2011. We would also make the more contentious point that actuarial extrapolation of decreased mortality rates has limitations, and a more biologically informed view, or one recognising the currently depressed state of drug development pipelines, does not support the continuation of this trend: e.g.

<http://onlinelibrary.wiley.com/doi/10.1111/j.1728-4457.2007.00172.x/abstract>. (Abstract below.)

5. We see an element of circularity in the valuation. A large part of the deficit estimate is driven by the assumptions on future returns. These assumptions are driven by a de-risking strategy designed to avoid further reliance on the employer covenant. (See 'Employer covenant below.') This further reliance has been deemed undesirable because of the extra costs caused by the deficit estimate.

6. We are concerned that the difference between liabilities under the technical provisions basis and under the self-sufficiency basis is a very crude measure of the real risk being undertaken by a large scheme with a diverse asset portfolio, and is hence a poor measure of reliance on the employer covenant. In addition, the adoption of a 20 year horizon for the robustness of the employer covenant appears arbitrarily small, given the absence to date of any institutional failure in a sector in which many institutions having existed for over a century, and a number for many centuries. This excessively short horizon adversely affects the estimated funding position.

We are especially disturbed to note that points 2, 3 and 5 also apply to the self-sufficiency and economic basis calculations, and even to the 'neutral basis' calculation. From the information provided in sections C.5 and C.16 of the AV consultation, it appears that moving to evidence-based assumptions on salary growth and RPI would show the scheme to be in healthy surplus on a neutral assumptions basis. Remove the de-risking assumptions and that surplus would be substantial. Substitute historic asset growth performance for Gilts plus and the neutral basis would show a very substantial surplus.

With regard to points 1-3, in particular, it seems that the assumptions are chosen in a manner that is economically incoherent. For example, wages growth assumes a thriving economy, while asset growth assumes a recession. This sort of incoherence in the assumptions goes well beyond what could reasonably be considered prudent pessimism. The third paragraph on RPI in the appendix gives a particularly influential example of incoherence.

Guidance from the Pensions Regulator is that valuations should not be based on only worst case assumptions in every issue. Rather, "an appropriate overall level of prudence in the technical provisions should be the paramount objective" of a valuation. "Indeed, in the extreme, for some less key assumptions it might be appropriate to assume best estimate, as long as overall technical provisions are adequately prudent" (Code, para 84, 85).

Our concerns are strengthened by a further observation. By their nature, the scheme's real liabilities must vary slowly on a decadal timescale. Liability estimates that show rapid variation on a scale of months to years (as they do for USS) are an indication of instability in those model-derived estimates, not the underlying reality. We would urge you to change to a more stable methodology, rather than allowing the actuarial assumptions tail to wag the investment strategy dog, by 'de-risking' into Gilts and substantially reducing members benefits. The wild swings in actuarial valuations we are now seeing are either the classic symptoms of a controlled system with (highly undesirable) positive feedback or the "chattering" you get with a controlled system where the control needs to be smoothed over time.

We are not arguing that nothing should change. We are supportive of CRB as a fairer approach than final salary for defined benefits (DB) (provided the transition is made with appropriate adjustment to avoid large average benefit reductions). But we are particularly disturbed (i) that the de-risking strategy involves a move away from economically useful long term investment in productive assets into less productive government debt, and (ii) about the defined contribution (DC) element being introduced into the scheme



as a result of a valuation based on what appear to be poorly-founded assumptions. The comparison between DB and DC is unfavourable for DC:

A recent report commissioned by the Canadian Public Pension Leadership Council (October 2014) concludes:

"Large, well-run DB plans are more efficient at producing retirement income than are DC plans. Several U.S. states that have looked at converting DB plans to DC have concluded that it would cost considerably more to maintain similar benefits. Two states that had converted to DC at least partially converted back because of concerns over how little income they were producing for retirees (Nebraska and West Virginia)."

The USS trustee has a responsibility to manage the scheme so that the promised benefits are paid as they become due; to meet this responsibility only by changing the promise and offering much reduced benefits is an exercise in using the letter of the law to destroy the spirit. If, by contrast, reasonable assumptions regarding the valuation of liabilities and the need to de-risk investments were adopted, it would be possible for all USS members to be moved over to a career average salary DB scheme that is superior to the hybrid DB/DC proposal now on offer, with greatly reduced reduction in average benefits.

The guidance from the pensions regulator states that: "As a trustee, you must protect the interests of beneficiaries." In that spirit, we urge you to replace the valuation assumptions with assumptions better grounded in evidence, and to move to a methodology better reflecting the scheme's real investment performance and more suited to long-term planning. We also urge you to be more prudent by not pushing all assumptions simultaneously to their most pessimistic limit, but rather by aiming for balance and a measure of economic self-consistency.

Yours sincerely



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Professor Peter Green FRS, professor emeritus of statistics, University of Bristol

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Sir David Spiegelhalter FRS, Winton professor of the public understanding of risk, University of Cambridge

Professor Charles Taylor, University of Leeds

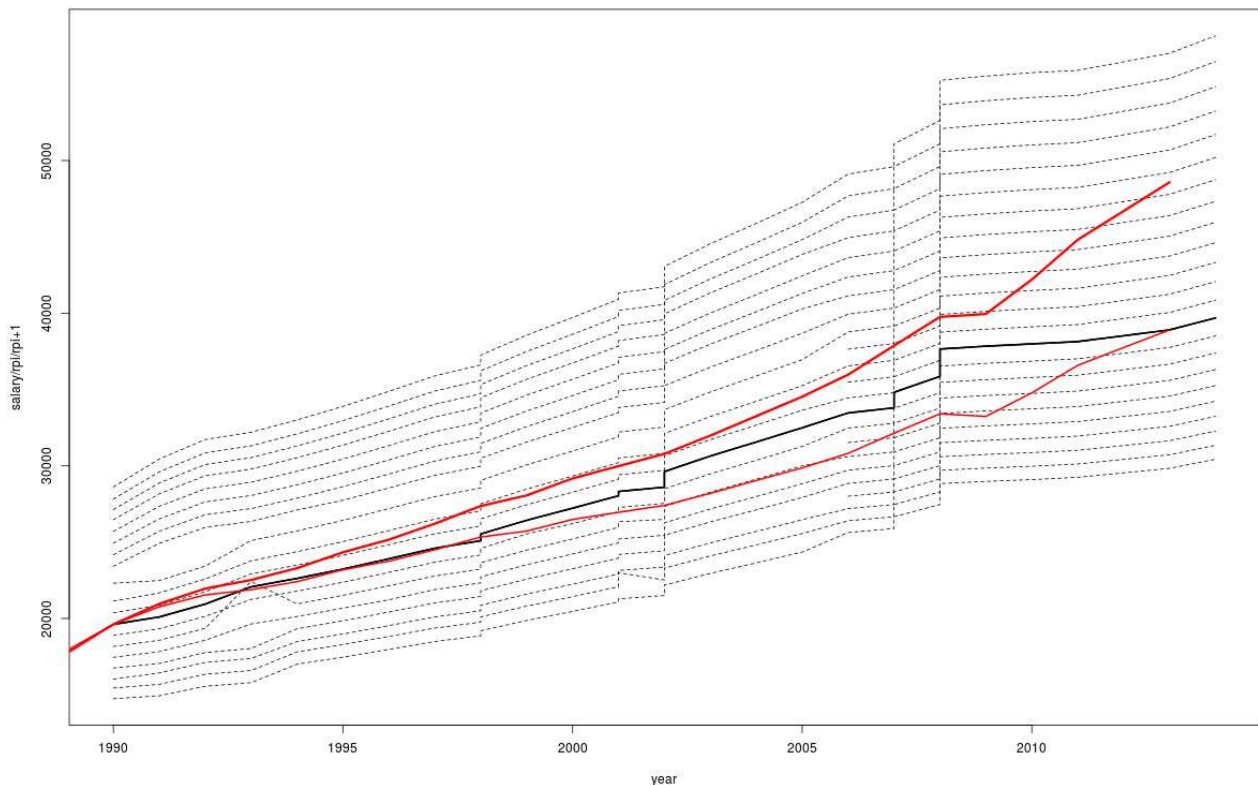
Professor Qiwei Yao, London School of Economics

Professor Michalis Zervos, London School of Economics

## Appendix

### 1. Salaries

Model checking includes comparisons with historical data. The figure below shows actual salaries, 1990-2014. Each grey line represents a spine point on the current scale. To compare the actual data with the USS assumption, spine point 38 is highlighted in black. The lower thin red curve is RPI (until 2013) [from ONS data], normalized to the spine point 38 salary in 1990. The thick red curve is RPI + 1% as assumed for future wage growth for the USS valuation.



The USS assumption results in over-estimation of salaries (and hence final salary pension liability) of about 25% over 23 years. As USS adds a further 1-4% for progression and salary grade inflation, this will substantially over-estimate the liability, and contribute to the estimated deficit.

Technical details: The 2006 regrading is matched using UCU data from 2005-6. There are a couple of obvious data errors in a couple of series which have not been corrected. Where the series jump in steps it is because that year's increase came in 2 parts - time is rounded to the nearest year. Code and data are available on request.

### 2. RPI

The assumption for RPI inflation is 3.4%. This is a "market derived" number, meaning that it is derived from a break-even inflation rate (under the assumption that the inflation risk premium of 0.2% in year 1 falling to 0.1% over the twenty year period) and from the real yield on Index-Linked Gilts. The Bank of England's inflation target is much lower, and we believe, given all that's gone on since 2008/09, that the risk premium in the break-even is almost certainly, much, much higher. From what is written in the AV consultation, reducing the RPI assumption from 3.4% even to 2.8% would reduce "technical provisions" by around £5.4bn.

The reason for reducing the inflation risk premium is invalid. It is simply wrong to claim that the risk premium should fall because exposure to inflation is falling over time. The inflation risk premium has nothing to do with USS's exposure to inflation. It has everything to do with the market view of uncertainty surrounding future inflation expectations – hence the comment above that it should be much, much higher than 0.2%pa.

The incoherence of the RPI assumptions can be seen by looking at the assumed market derived figure of 3.6% including risk premium, and comparing that to the current CPI of 1.4%. Allowing a 0.9% difference to RPI, suggests a risk premium around 1.3% now. Being prudently conservative it might be reasonable to reduce that to 1%, but not to the 0.2% actually assumed.

### 3. A Realist View of Aging, Mortality, and Future Longevity

Bruce A. Carnes and S. Jay Olshansky

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Differences in methodology and philosophy have led scientists analyzing the same mortality data to arrive at very different conclusions about the behavior of mortality trajectories, the nature of aging, and the future of human longevity. This note describes the authors' views on these issues, which taken together can be termed a "realist" position. In this view, life expectancy is unlikely to exceed an average of 85 years absent significant advances in the control of aging. We identify a number of myths that have been attached to our work: 1) Reaching an average life expectancy of 85 years is a pessimistic outlook for human longevity, 2) Species possess an intrinsic mortality schedule that cannot be modified by human intervention, 3) Realist scenarios of the future course of human longevity are based on notions of biological determinism, 4) Realists assert that there is an age beyond which there can be no survivors, 5) Hypothesized biological barriers to longer life spans have been scientifically studied and refuted, and 6) Realists claim that life expectancy at birth cannot exceed 85 years. In dispelling these myths, we hope to provide a more accurate representation of our school of bio demographic thought.

### 4. Employer covenant

The employer covenant is originally a private sector concept. It is being applied to the HE system as though there were **one** employer whose long term "survival" is uncertain. We argue that the Government has providing a level of backing to the HE system for the 40 years of the lifetime of USS, and continues to do so. Hence the idea of thinking about a 20 year covenant seems to be false. The covenant is described as being robust in some of the documents and yet the future time frame for the duration of this robustness is taken to be 20 years. This is an important assumption. Is there any evidence to support the assumption? How do we know that 20 years is the right number? The background is that no university has become insolvent to the extent that it has been unable to meet its (employer's) pension contributions.