



Note 1 on USS 2020 Valuation Funding and Prudence

This note is provided to the University and College Union. It is the first of several notes in which we will be examining different aspects of the valuation of the Universities Superannuation Scheme (USS). In this first note, we look at prudence in the valuation.

Use of language

It is an explicit requirement of the statutory funding regime that the funding valuation be “prudent”. “Prudent” is generally accepted to mean on the cautious side of an unbiased estimate. An unbiased estimate is one where future outcomes are roughly equally likely to be better or worse than estimated. The term “best estimate” is also often used for this concept but we tend to eschew this term as lay readers tend to interpret “best” as “most favourable”.

Prudence

In their briefing “Prudence in the 2020 Valuation” dated 3 March, USS note that “prudence, like risk, is a multifaceted concept, the assessment of which requires the use of several lenses”. In section 6 of this paper, they explain the need to contextualise prudence. If we understand their argument correctly, it means for example that a basis which had exactly the same strength (leaving aside how strength is measured) on two dates would be less prudent if on the second date, the employer covenant had weakened.

We agree with USS that the valuation must be considered holistically to understand the overall strength of the basis. But we think using the same word prudence to describe all the factors the Trustee needs to consider can be confusing. To date, we have tended to use the term prudence to mean the extent to which the Technical Provisions (technical provisions: the prudent value placed on liabilities in the statutory funding valuation) and the calculated future service rate contain a margin for future events being worse than expected. We would prefer to reserve this terminology in discussions. If, as in the scenario outlined above, the employers’ covenant has weakened over a period, that would imply a need to increase the prudence in the setting of the Technical Provisions rather than meaning that prudence at the two dates can no longer be compared.

In this paper, we reserve prudence to mean the margins in the Technical Provisions and future service rate. We use the alternative phrases “layers of caution” and “overall strength of the valuation” to indicate other areas where USS are building up additional protections against future events being worse than expected.

Liabilities

The same word “liabilities” is often used in the pensions industry to mean two different things. The liabilities of a defined benefit scheme are the benefits payable as they fall due from month to month and year to year. The word “liabilities” is also often used to refer to the value placed on liabilities in an actuarial valuation. The value placed on liabilities is the sum of money which, if invested to earn a return equal to the chosen discount rate, suffices to pay the benefits in full as they fall due. The value placed on liabilities can be any number: it can be a high number if the discount rate is low, it can be a low number if the discount rate is high. The meaning of the value placed on liabilities is dependent on the approach used to set the discount rate.

In this note, we reserve “liabilities” to refer to the benefits payable to members, these are the actual liabilities of the scheme. We use “value placed on liabilities” to refer to the actuary’s calculation.

Layers of caution

In the calculation of the overall contribution rates for the 2020 valuation, the USS has applied several layers of caution:

- The USS has made prudent assumptions for placing a value on liabilities (as it is required to do)
- The USS has made prudent assumptions for putting a value on each year’s future accrual of benefits (which it is not actually required to do, but it is common practice)
- The USS has assumed a notional investment strategy which has a lower expected investment return than the actual investment strategy
- The USS has assumed a lower return on the notional investment strategy than an unbiased estimate of the return on the notional strategy
- The USS has allowed a period of time for improving the funding level (lately, 10 years) which is short relative to the visibility of the persistence of the collective financial strength of USS’s employers (put at 30 years by USS’s covenant adviser). Contrast this to a not uncommon 10 year recovery period for a scheme sponsored by a single commercial employer where the persistence of the financial strength of the one commercial employer might not be more than 5 years.

The combination of all these layers of caution put together (that is; place a high value on accrued liabilities, place a high value on the cost of accruing benefits, allow only a short time to achieve the high funding target, ignore much of the scope for investment return to help the USS get to the high target) results in a very high contribution rate demand from the USS.

In this note we seek to illustrate some of the layers of caution and in particular the prudence in the valuation basis.

Scheme Assets Exceed an Unbiased Value of Liabilities

We record below the assets, the unbiased estimated value placed on liabilities and the unbiased discount rate for each of the four valuations at 31 March 2014, 2017, 2018 and 2020.

| Unbiased valuation results | 2014 | 2017 | 2018 | 2020 USS | 2020 FA |
|-----------------------------|-----------------------|-----------------------|-----------------------|-----------------------------------|-----------------------|
| Assets | £41.6 bn ¹ | £60.0 bn ² | £63.7 bn ² | £66.5 bn ² | £66.5 bn ² |
| Value placed on liabilities | £38.1 bn ¹ | £54.8 bn ² | £54.3 bn ² | £67.2bn to £62.5 bn ² | £52.1 bn ³ |
| Surplus/(deficit) | £3.5 bn | £5.2 bn | £9.4 bn | (£0.7bn) to £4.0bn | £14.4bn |
| Funding level | 109% | 109% | 117% | 98% to 106% | 128% |
| Unbiased discount rate | - | CPI+1.8% ⁴ | CPI+2.0% ⁴ | CPI+1.1% to CPI+1.5% ⁴ | CPI+2.5% ⁵ |

Notes

¹ [USS Technical provisions consultation document, 1 September 2017](#)

² [USS briefing, Prudence in the 2020 valuation, 3 March 2021](#)

³ First Actuarial calculation: We constructed a model set of benefit cash flows which reproduce the valuation result when valued using the valuation discount rate, then valued them using the unbiased discount rate

⁴ First Actuarial calculation: Given the USS's data on the prudent value placed on liabilities, the unbiased value and the valuation discount rate, we were able to infer the discount rate for the unbiased valuation.

⁵ First Actuarial calculation: Given USS's opinion of expected returns and the actual USS asset allocation, we calculated the unbiased real discount rate from their data (further detail is in the appendix).

We should comment on the unbiased estimate of the value of the liabilities provided by USS in their document on prudence. The figures shown by USS is accompanied by a note reading "The range for the BE [BE = best estimate = unbiased estimate] liability for the 2020 valuation reflects the fact that the investment strategy has not yet been determined". The implication is that the USS is part way through developing a plan to rearrange the assets, in which a downside consequence is a lower expected return. These plans have yet to be shared or be consulted on. In the Appendix, we show that one way to reduce the expected return on the portfolio from CPI + 2.5% to CPI + 1.1% to 1.5% is to move around 20% to 30% of the assets out of equities into listed credit and bonds of various kinds.

We have shown for information an unbiased value of liabilities based on the present investment strategy continuing and using USS's unbiased estimates of returns. We intend to discuss investment strategy in a future note.

The first layer of caution

The point to note from the figures above is that the first protection against adverse events are the surplus assets that already exist in the USS, as the difference between the amount of the assets held and the amount required to pay the benefits in full were the assets to earn the unbiased return the USS expects from the assets. This reserve is not generally identified explicitly in actuarial valuations but the surplus over the unbiased value of the liabilities is the first layer of caution.

The greater the excess of the assets over the unbiased value placed on liabilities, the more protection there is against adverse events, such as the actual investment returns averaging out at less than the unbiased return originally expected.

Layer of Caution 1: £14.4bn surplus assets relative to the unbiased estimate of the value of the liabilities

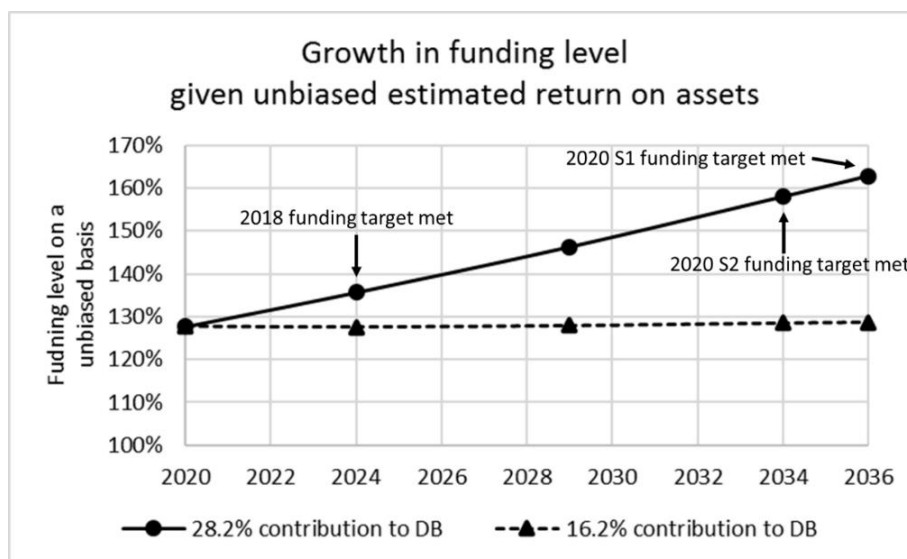
Caution in the contribution rate

The present contribution rate is 30.7% of pay, before the increase to 34.7% scheduled for October 2021. Of the 30.7%, 2.1% goes towards defined contribution accounts and 0.4% towards expenses, leaving 28.2% to go towards the provision of Defined Benefits (DB).

Were 30.7% to continue to be contributed for the long term (we turn later to the effect of contributing 34.7% as presently scheduled), we illustrate in the following chart an unbiased estimate of the way the funding of the USS is expected to grow.

The 2018 valuation used a discount rate for technical provisions equivalent to CPI + 0.92%. Given the expected return on the assets and contributions towards DB of 28.2%, the USS is expected to be fully funded on this discount rate in 2024.

Scenario 2 for the 2020 valuation uses a discount rate for technical provisions equivalent to CPI + 0.14%. Given the expected return on the assets and contributions towards DB of 28.2%, the USS is expected to be fully funded on this discount rate by 2034.



Were the contribution to defined benefits to be 16.2%, the funding level on an unbiased basis is not expected to change (see the dotted line on the chart). Therefore, of the 28.2% paid towards DB, 16.2% maintains the funding level as it is, and 12.0% goes towards improving the funding level.

Layer of Caution 2: Every year, 12.0% of pensionable pay of £8.7bn, which is around £1.0bn per annum, is added to the surplus assets relative to the unbiased estimate of the cost of providing the benefits from the current assets

We make one more point before moving on from this chart. It is seen that the present contribution rate to the USS is expected to result in an improving funding level, and the expected growth in funding level is not tailing off with time. Given a trend of steady improvement in the funding level, any funding target can be met given time, with a lower funding target met sooner and a higher funding target being met later. A natural response to setting a higher funding target is to allow more time to get there. It is not necessarily so that the contribution rate needs to be further raised.

What if the assets do not earn the expected return?

We already have two protections against an adverse outcome: the £14.4bn additional funding which the USS already has and the £1bn per annum additional funding being added to it.

A key purpose of prudent funding is to have spare funds which can absorb the ups and downs, leaving a fairly stable contribution rate for the employers and active members. If the effect of funding volatility is that at some times there is much more than enough money, but at other times there is less money but still more than enough, then it may be possible to accept that there will be some volatility, be patient and let the trend of improvement come through.

If 28.2% is paid to the USS towards defined benefits (i.e. the present 30.7% less 2.5% for DC and expenses), a long run return on the assets of $CPI + 0.9\%$ maintains the funding level where it is now. More than that, and the funding level improves. Less than that and the funding level declines.

If 32.2% is paid to the USS (i.e. the 34.7% planned from October 2021 less 2.5% for DC and expenses), a long run return on the assets of $CPI + 0.4\%$ maintains the funding level where it is now. More than that, and the funding level improves. Less than that and the funding level declines.

An important question is what is the likelihood of the long run investment performance exceeding $CPI + 0.4\%$ or $CPI + 0.9\%$? If the probability is high, the contribution rates are sufficient.

Another important question is, when do we react to the possibility that the long run investment performance is less than $CPI + 0.4\%$ or $CPI + 0.9\%$? When it happens, if it does, or before? A problem to avoid is acting as if an unlikely event will definitely happen.

We will examine these questions in further work to come.

Increase in funding target

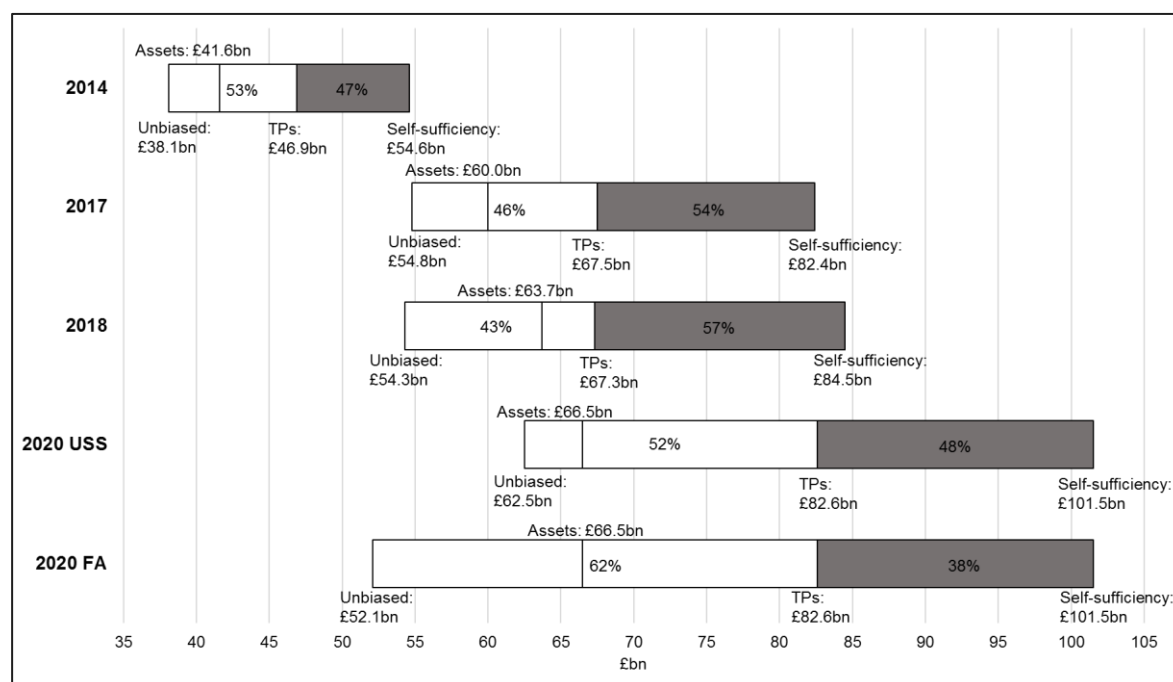
There is a notable increase in the funding target between the 2018 and 2020 valuations, as illustrated by the widening difference between the unbiased discount rate and the valuation discount rate. A greater amount of the expected return is being ignored in the prudent approach proposed. The unbiased discount rate for 2020 is based on the existing investment portfolio.

| | 2018 | 2020 Scenario 2 No outperformance in Recovery Plan |
|-------------------------|-------------|--|
| Valuation discount rate | CPI + 0.92% | CPI + 0.14% |
| Unbiased discount rate | CPI + 2.0% | CPI + 2.5% |
| Difference | 1.08% | 2.36% |

In their paper on prudence in the valuation, USS point out that part of this increased prudence is then removed by the allowance for outperformance in the recovery plan. Whether or not an allowance is made for the return on the assets to outperform the discount rate during the recovery period does not affect the size of the trustee's funding target at the end of the recovery period. As we explained earlier, we think the use of the word prudence to describe other aspects of the overall strength of the basis is confusing.

Level at which Technical Provisions is set

We have discussed in engagements on previous valuations the way in which the “stretching” of the gap between a self-sufficiency level and an unbiased estimate of the liabilities can have a pull on the level at which Technical Provisions (i.e. the funding target) is set which can tend to obscure the strengthening of technical provisions. The chart below shows the different levels at which the Trustees have set the Technical Provisions in recent years.



Observations about this chart include:

- The assets have grown relative to the unbiased estimate, and the funding level is expected to continue to improve.
- The “self-sufficiency” values have escalated rapidly over the 6 years between the 2014 and 2020 valuations. The self-sufficiency value is the expected cost of providing the benefits while invested in low risk/low return assets such as bonds. It is being close enough to this value which makes the Trustee feel comfortable. The yield on 20 year UK Government bonds, for example, has declined from 3.61% at 31 March 2014 to 0.87% at 31 March 2020, and it is because investments in these bonds earn so little that the self-sufficiency value is so high.
- As the self-sufficiency value has escalated, the difference between the self-sufficiency value and the unbiased estimated value has widened. The Trustee’s choice of funding target has stayed nearer to the self-sufficiency end of the spectrum, creating a wider difference between the funding target and the unbiased estimate of cost. The funding target is becoming more onerous.

Actuarial standards

The following Technical Actuarial Standards apply to this work: TAS 100: Principles for Technical Actuarial Work and TAS 300: Pensions. We confirm we have complied with their requirements.

Hilary Salt FIA
Derek Benstead FIA

First Actuarial LLP
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Appendix

Unbiased estimate of the expected return on assets as at 31 March 2020

First Actuarial constructed this from USS's opinion of the return expected from the main asset classes, and the current allocation of assets as summarised in USS's accounts for the year ending 31 March 2020.

| Asset class | USS's expected return | Asset class in USS accounts | Allocation at 31 March 2020 |
|--------------------------|-----------------------|--|-----------------------------|
| Equities | CPI + 4.39% | Listed equities Other private markets | 38.4% 21.9% |
| Property | CPI + 1.80% | Property | 5.5% |
| Listed Credit | CPI + 1.68% | Other fixed income Absolute return Commodities | 11.0% 2.0% 1.1% |
| US TIPS | CPI - 0.28% | | |
| UK index linked gilts | CPI - 1.57% | Index linked bonds | 26.9% |
| UK nominal gilts | CPI - 1.14% | Nominal bonds | 6.5% |
| Cash | CPI - 0.04% | Cash and overlays | (13.3%) |
| Overall portfolio | CPI + 2.5% | | 100.0% |

There is a degree of arbitrariness in allocating absolute return and commodities to listed credit, but the allocation to these classes is small so it is of little importance. We bundled them into the category with the lowest positive real return.

Indicative alternative portfolios

USS's 2020 values for the unbiased estimate of the value of benefits suggest they are considering portfolios with expected returns in the region of CPI + 1.1% to CPI + 1.5%. We show below possible portfolios giving these expected returns.

| Asset class | USS's expected return | Present allocation | Possible alternative 1 | Possible alternative 2 |
|---|-----------------------|--------------------|------------------------|------------------------|
| Listed equities Other private markets | CPI + 4.39% | 60% | 40% | 32% |
| Property | CPI + 1.80% | 6% | 6% | 6% |
| Listed Credit (and Absolute return Commodities) | CPI + 1.68% | 14% | 20% | 22% |
| UK index linked gilts | CPI - 1.57% | 27% | 38% | 43% |
| UK nominal gilts | CPI - 1.14% | 6% | 9% | 10% |
| Cash | CPI - 0.04% | (13%) | (13%) | (13%) |
| Unbiased expected return on portfolio | | CPI + 2.5% | CPI + 1.5% | CPI + 1.1% |