2018 Valuation and Contingent Contributions

Universities Superannuation Scheme (USS)

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Date	27 February 2019

Table of Contents

1. Introduction

Introduction

We have been asked by Universities UK (UUK) to work with them to develop a proposal (the Proposal) for the terms of payment of Contingent Contributions to the Universities Superannuation Scheme (USS) for consideration by employers.

The USS Trustee consultation on the Technical Provisions for the 31 March 2018 actuarial valuation of USS introduced the concept of Contingent Contributions, as the principal means of providing tangible additional support to demonstrate employers' willingness to adopt greater risk in respect of the Scheme, which in turn leads to lower (initial) contributions following the valuation.

Developing the Proposal

In our 14 January note, we envisioned preparing further advice once it was clear what the USS Trustee required for support to justify the Lower Bookend. The USS Trustee subsequently decided not to provide that information, and instead asked Universities UK to make the first proposal.

To assist this alternative process, the USS Trustee has set out 11 principles in a document dated 7 February. In addition, the USS Executive has provided various information to assist in the development of the Proposal.

The Proposal

In this note we set out a Proposal for a Contingent Contribution structure, and comment on the potential implications for employers. With UUK, we have developed the Proposal to be consistent with the USS Trustee's 11 principles.

Context

There is a risk, given the USS Trustee's decision not to table its own proposal for Contingent Contributions, that any Proposal developed by UUK and Aon will be judged by the USS Trustee as having insufficient value. The USS Trustee could then decide that the initial contribution rate will not start at the Lower Bookend, but somewhere between the USS Trustee's two Bookends with Contingent Contributions on top.

The Proposal in this paper has been designed to secure an initial contribution broadly in line with the JEP recommendation. This was the basis on which UUK consulted with employers in September/October 2018. Employers overwhelmingly endorsed the JEP recommendations, understanding that some tangible contingent support may be needed. The Proposal is consistent with that tangible contingent support.

Interaction with the JEP Report

We set out some observations on how the Proposal in this report relates to the JEP Report in Appendix 1.

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2. Bookends revisited

Introduction

In this section we develop a potential position on the bookends that forms a key ingredient to the Proposal. This is based on our earlier advice note dated 14 January which included our initial comments on the proposed bookends.

Role of "rebate"

At a basic level, Contingent Contributions are a mechanism to increase contributions if the funding position gets off track to a material extent before the next valuation. This serves two purposes – to improve the position ahead of the next valuation, and to establish a higher contribution rate as the starting point for the next valuation.

The USS Trustee also views the mechanism as enabling what they call a "rebate". That is, they first determine the contribution rate absent additional support (the Upper Bookend), and a "rebate" is then given by the USS Trustee which they determine based on what Contingent Contributions are provided.

Upper Bookend

If no *additional* support is offered, then the USS Trustee proposes an overall contribution rate of 33.7% of pay (which would be 23% for employers, and 10.7% for members under default "cost-sharing"). Ultimately, under the Rules of the Scheme, this is a Trustee decision subject only to actuarial advice and to consultation with UUK.

Our view is that 33.7% would be a more prudent approach than for the 2017 valuation from a risk perspective (although it does take into account new information). We say this for two reasons:

- More prudence in the recovery plan: In our view, maintaining a 5% deficit contribution rate would introduce more prudence over the period to the next valuation, compared with the approach taken at the 2017 valuation. That's because the proposed deficit has more than halved (from £7.5Bn at 31 March 2017 to £3.6Bn at 31 March 2018).
- Neutral impact for future service contribution: As explained in our 14 January note the changes here are updates for new information or refinements to the accuracy of the calculation, and hence we view the changes as risk neutral. In its 2 January consultation the USS Trustee largely agrees with this characterisation.

The USS Trustee is due to consult on the recovery plan later in the process, but it is a key component of the Upper Bookend and we believe that UUK cannot defer giving views on the recovery plan at this stage. Deficit contributions of 5% of pay would require a recovery plan as short as around 11 years with no allowance for asset outperformance. For a scheme with a covenant that was assessed to be strong and to have long-term visibility, we believe the USS Trustee could be comfortable adopting a longer recovery plan and/or sharing asset outperformance with members, which help smooth out intergenerational issues.

To develop a Proposal (and without wishing to prejudice the formal consultation on the Recovery Plan), we have used a deficit contribution of 3.5%. Based on information provided in the consultation, this is equivalent to a 14-year recovery plan with no allowance for asset outperformance. This is a little more prudent than simply scaling down the 2017 valuation contributions for the updated deficit, however there must be a reasonable gap between the bookends for the Contingent Contributions to have "value". This leads to an Upper Bookend of 32.2% of pay which would be 3% (or three steps of 1%) higher than the Lower Bookend defined below.

Lower Bookend

For the Lower Bookend, it appears that the USS Trustee would be more comfortable with 29.7% rather than 29.2%. The difference in contributions over a 3-year period would be around £0.12Bn which is not material in the context of the Scheme.

For the Proposal, we assume that 29.2% is adopted, although it is not clear that this is achievable with the USS Trustee. This could be arrived at in different ways. In the illustration below we have maintained the deficit contribution at 2.1% of pay (as proposed in the consultation provided that sufficiently valuable Contingent Contributions are offered). We estimate that this is equivalent to a 15-year recovery plan with no allowance for asset outperformance (to correct a deficit of £2.2Bn on the proposed Lower Bookend Technical Provisions assumptions).

We believe the future service contribution rate can be adjusted credibly downwards to reflect the fact that – under the Technical Provisions assumptions – the cost does decline over time. This was one of the JEP recommendations that has not yet been adopted by the USS Trustee, although we note that this does not increase the risks being taken in respect of the past service deficit. Other approaches are possible.

Bookends adopted for Proposal

For the Proposal we assume the following. All these figures include prudence (or a contingency margin) relative to the position had the JEP recommendations been adopted in full for the 2017 valuation.

Aon Table 1: Bookends adopted for Proposal

	Future Service Contribution	Deficit Recovery Contribution	Total Contribution
Upper Bookend	28.7%†	3.5%	**32.2%**
Lower Bookend	27.1%*	2.1%	**29.2%**
Difference			3.0%

(†) Note: The future service contribution figure is consistent with the USS Trustee's 2 January 2019 consultation.

(*) This is 0.5% lower than the figure of 27.6% used in the USS Trustee's first proposal for the Lower Bookend. We assume that a modest amount of smoothing of the future service contribution rate has been applied (less than the 6-year smoothing recommended by the JEP).

3. Developing the Proposal

Contingent Contributions

The Proposal has been developed against several structural and practical requirements which we and UUK have applied in our technical discussions with the USS Executive team and the USS Trustee's advisers (Mercer). These requirements can be summarised as follows:

- Any proposal is conditional on the USS Trustee accepting the Lower Bookend as the initial contribution rate.
- Additional contributions are only triggered in more extreme conditions (not by normal market movements, as a strong covenant with a 30+ year horizon can support waiting until the next valuation to deal with normal movements).
- Phased contribution increases with three potential step-ups, with each step equal to 1/3 of the difference between the Upper Bookend and the Lower Bookend.
- Lower Bookend of 29.2%, and Upper Bookend that is sufficiently high for the Contingent Contributions to be deemed to have sufficient value by the USS Trustee.
- The trigger metric should be Technical Provisions, not Self-Sufficiency, corresponding to how the scheme is funded.
- Any deterioration should endure for a reasonable period e.g. two or three quarter-ends, and there should be some smoothing (e.g. average of last three months).
- A notice period of at least six months between the trigger being breached and increased contributions applying, to allow the JNC to consider alternative approaches, and to allow institutions to mitigate the impact of paying additional contributions.
- The approach should be proportionate, and not overly complex given that JEP Phase 2 will provide a broader review.

Other issues

There are two other points that have guided the Proposal:

- UUK has indicated that any "rebate" should be shared in accordance with the cost sharing provisions (i.e. in the ratio 65% by employers – and 35% by employees), for consistency with the back-stop. The backstop could be either the Upper Bookend level of contributions from the 2018 valuation, or the Rule 76 contributions that come into effect in October 2019 (32.9%) and April 2020 (35.6%).
- The next actuarial valuation is important in providing a reset of any Contingent Contributions. This may take place as at 31 March 2021 (three years after the current actuarial valuation), or as at 31 March 2020 (three years after the 2017 valuation). The latter approach makes it clear that the 2018 valuation was an "out of cycle" valuation, designed to facilitate the consideration of the JEP recommendations.

USS Trustee's 11 principles

Although the USS Trustee decided not to offer fully developed proposals, in its 7 February paper, the USS Trustee set out 11 principles that it indicated any acceptable arrangement for contingent contributions should satisfy. In Appendix 2, we demonstrate how the Proposal is consistent with these principles.

4. Proposal for UUK to consult with Employers

High-level overview

In this section we set out the key elements of the Proposal:

Aon Table 2: Key elements of proposal

Parameter	Proposal for consultation with employers
Initial contribution rate	29.2%, from 1 October 2019
Trigger threshold	Deficit exceeds £10Bn on (a modified) Technical Provisions basis, corresponding to a c.30% chance of applying before 30 June 2022
What contributions are paid if trigger applies and continues to apply	First step-up of 1% to 30.2% Second step-up (a year later) to 31.2% Third step-up (a further year later) to 32.2%
Notice period	6 months, during which time JNC can make an alternative decision
Detailed points	Quarterly monitoring, based on average of three month-ends. Trigger threshold needs to be breached for 2 successive quarters

Likelihood of Contingent Contributions being needed

Proposal: Trigger Metric set such that it has about a 30% probability of being triggered *(over a 3.5-year period, taking into account the statutory deadline for the 31 March 2021 valuation, i.e. 30 June 2022)*

We start from the premise that the Contingent Contributions should trigger only if there has been a "significant deterioration" in the financial position of the Scheme – Contingent Contributions should not be expected under normal conditions, but only in more extreme conditions. We develop our thinking in the following table, where we set out our views on objective anchors for the likelihood of payment:

Aon Table 3: Objective anchor points for probability of trigger applying

Probability	Aon comments – why relevant
16% as guide for one standard deviation	The USS Trustee has in the past provided a funnel of outcomes where they monitor whether the position is beyond what ***"might reasonably be expected"***. This is defined as a funnel of the: "*expected path plus or minus **one standard deviation)**". Example source: page 15 of link*. To be outside of the path the USS Trustee might reasonably expect due to normal market noise, one would need to have the trigger likelihood lower than about 16%.
10% and 30%	There are two markers in the sand from the USS Trustee's "Test 2". As you may recall, this required the probability of (employer) contributions exceeding 18% at the next valuation to be **low** (defined as 30%), and the probability of exceeding 21% to be **very low** (defined as 10%).
33% as upper bound	33% can be viewed as a broad upper bound on the probability of Contingent Contributions applying, based on conditions at the valuation date. If this were not the case, then the USS Trustee would expect to receive Contingent Contributions in some of the 67% of scenarios where they by design have enough assets, and this would not be credible. That's because in broad terms the valuation discount rate is chosen as the 67th percentile of the current investment strategy (including assumed "de-risking"), and the recovery plans do not need to include asset outperformance (which would slightly reduce the overall percentage chance of assets + agreed recovery plan contributions being sufficient to deliver accrued benefits).

Bringing this together, in initial discussions with UUK, we were comfortable using 10% for a proposal. However, in discussions with the USS Executive, we have been advised that a 10% probability would be well outside the USS Trustee's risk appetite because it would correspond to a trigger deficit of about £18Bn (on a gilts plus proxy to the Technical Provisions assumptions – explained further below), or a trigger of about £40Bn on a self-sufficiency basis.

To put forward a proposal that has a realistic chance of being accepted by the USS Trustee – and will therefore be consistent with a starting contribution of the Lower Bookend – we have moved significantly from where we believe the original concept for Trigger Contributions should lie, to proposing a figure of about 30% for the trigger probability.

The suggestion of using this much higher probability of triggering (i.e. c.30%) – close to what we would argue is the upper limit of the range (i.e. 33%) – is designed to ensure the Proposal can be accepted readily by the USS Trustee. In the next section of this report, we comment on the potential implications of accepting a trigger with this probability of applying.

What Contingent Contributions are paid

Proposal: 1%, 2%, and 3% of pay

In the USS Trustee's example set out in its 2 January 2019 consultation paper, it suggested three steps of 1.5% of pay.

Since the trigger process contains some approximations and simplifications (see below) compared with a full actuarial valuation – and has a material chance of applying (c.30% under the Proposal) – it is important that the step sizes are not overly large.

For a covenant that has been independently assessed by the USS Trustee advisers as "strong" – with good long-term visibility, it is preferable to make steady steps rather than risk over-reacting, and to use the three-yearly valuation as the primary route for assessing contributions.

We suggest that each step should be an overall 1% increase in contributions, with three steps applying. If all three steps apply, then this leads to an additional 3% of pay which if maintained would provide around £250M p.a. to the USS Trustee.

Each step corresponds to the difference between the bookends used for the Proposal (i.e. 32.2% - 29.2%) divided by three. In practice, the Upper and Lower Bookends will be set by the USS Trustee, in consultation with UUK.

Notice Period

Proposal: 6-month delay before higher contributions apply

Employers and employees must have a reasonable period of notice to plan and try to mitigate the impact of any increases, and to allow the JNC time to consider alternative actions. This could include some element of proposed scheme reform subject to consultation, or potentially a request for an additional actuarial valuation (e.g. carrying out a 31 March 2020 valuation if the second trigger applies – although higher contributions would still need to be paid while a new valuation were carried out).

In the absence of a JNC decision the Contingent Contributions would apply. Based on discussions with UUK we suggest 6 months for the notice period.

Trigger Metric

Proposal: Technical Provision deficit

Technical Provisions are the obvious measurement to use for the Trigger mechanism.

Conceptually, we believe employers (and employees) may be able to buy into the concept that if the position is materially worse than expected on a Technical Provisions basis, then higher contributions are likely to be required at the next actuarial valuation – and it would not be wholly unreasonable to make some steps towards higher contributions ahead of the next formal valuation to improve the position and to establish a higher contribution rate as the starting point for the next valuation. In contrast, we do not believe a self-sufficiency approach (which seems to be favoured by the USS Executive in discussions) would garner similar support. Further comments are set out in Appendix 3.

The Technical Provisions are the Statutory Funding Objective, used by the USS Trustee to determine cash contributions to the scheme. The draft Statement of Funding Principles also states that there are no funding objectives provided for in the Rules of the Scheme or which the USS Trustee has adopted in addition to the Technical Provisions.

Contributions to the scheme relate to both future service and past service – both calculations use the Technical Provisions measure. In addition, the Upper and Lower Bookends both use the Technical Provisions measure to determine contributions – and so logically this approach should be used to determine whether contributions need to move between the Lower and Upper Bookend.

In its 11 December letter, TPR indicated a preference for *"contingent cash support to be provided"* in the context of *"any increased deficit"* and *"to support [investment] risk if it is not rewarded"*. While not unambiguous, this in our mind is consistent with a Technical Provisions approach focused on the amount of deficit.

Proposal: Accept a simplified approach to Technical Provisions leading a £10Bn deficit trigger (on the proxy basis)

For reasons set out earlier, we believe that the Technical Provision basis is the most valid measure to use in considering whether additional contributions are required. The Technical Provisions for the Scheme are unique in their construction, but broadly distil down to a 67th percentile return (applied to an investment strategy that "de-risks" over 20 years).

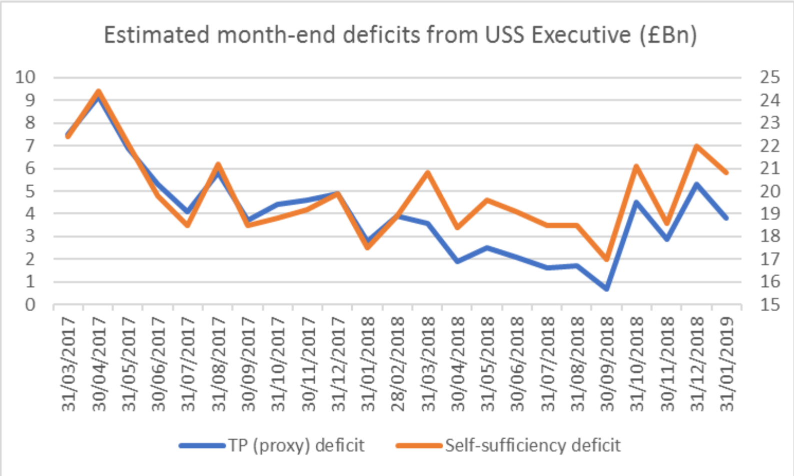
To give stakeholders most confidence in the approach, our preference would be to use a genuine effort at refreshing the Technical Provisions (keeping the 67th percentile prudence margin constant, using latest USSIM investment assumptions, and updating for national mortality data each year). This would lead we believe to a more stable funding position. In addition, a fixed "gilts plus" valuation approach may "break down" as a credible valuation method in precisely the conditions in which a trigger applies, leading to challenges over whether the trigger event is real.

However, this request appears problematic for the USS Executive to accept. Also, with our conceptualisation of aiming for a target likelihood (of about 30%), the precise actuarial measure becomes less important. In particular if a more volatile proxy measure is used, then the trigger amount will need to be higher (i.e. a c.30% outcome with a gilts plus proxy corresponds to a higher “deficit” trigger than would be the case had Technical Provisions being used). While not precisely equivalent, this provides a pathway to move on from this aspect of the debate.

In the spirit of trying to find a way through that is acceptable to all parties, we suggest a compromise approach is considered for adoption, as follows:

- The full calculation of the Technical Provisions deficit would take place at each 31 March, using the USS Trustee’s judgement about a 67th percentile, and any national mortality trends incorporated by the Scheme Actuary. (The USS Trustee needs to provide a view on Technical Provisions each year to produce the statutory Summary Funding Statement – the updated financial position prepared by the Scheme Actuary and sent to members on an annual basis.)
- For the month ends between scheme year ends, a proxy to the Technical Provisions deficit would be calculated, by using a gilts plus adjusted measure of liabilities. The “plus” value should be taken from the last scheme year end – for example from 31 March 2018 to 28 February 2019, the deficit would be calculated using a gilts plus proxy based on “gilts plus 1.33% p.a.” (see Table 3 on page 18 of the 2 January consultation).

Aon Chart 1: Estimated Technical Provisions (proxy approach) at all month ends since 2017 valuation. The chart is based on information provided by the USS Executive



Please note:

- We have shown the deficit on a Technical Provision (proxy) at each month-end, alongside the deficit on a self-sufficiency basis. Both measures are volatile and move in tandem for the first 11 months. Then, at 31 March 2018, the Technical Provisions (proxy) is refined to allow for updated USSIM investment returns (and both targets were slightly reduced to allow for new views on mortality).

- Between 31 March 2017 and 31 January 2019, based on figures provided by the USS Executive for their gilts plus proxy version of Technical Provisions, the average monthly movement in deficit is some £1.3Bn. To put this into context, the difference in contributions payable (Trustee's proposed Upper vs Lower Bookend) is only £1Bn over a 3-year inter-valuation period – and so the difference in contributions collected between bookends over three years is potentially worth less than one month's variation in the deficit.
- For information, the latest month-end estimate of the Technical Provisions (gilts plus proxy) deficit at time of writing is £3.8Bn at 31 January 2019.

Detailed points

The Proposal includes the followed detailed points:

- ***Frequency of monitoring: Quarterly monitoring of the funding level.***
- ***Smoothing: Each quarter-end funding level is calculated as the average of the three month-ends leading up to the quarter-end.***
- ***Period over which breach must be maintained: Two successive quarters.***

We elaborate further in Appendix 3. However, with our specification of a fixed likelihood of c.30%, what effectively happens is that if one wishes for different parameters for the above, then the trigger threshold would change to reflect this. We have been provided with some indicative figures from the USS Executive that help put all this into context.

Aon Table 4: Information provided by USS Executive on trigger amounts corresponding to 30% likelihood (aside from bottom right figure, estimate by Aon)

Scenarios	Technical provisions proxy	Self-sufficiency
	30% likelihood	30% likelihood
Proposal	£10Bn	c.£30Bn
Proposal but with measurement over one quarter, rather than two quarters	£12Bn	c.£32Bn

This shows that the Technical Provisions (gilts plus proxy) deficit would need to hit £10Bn for a trigger to occur under the Proposal. But if the deficit just needed to hit a threshold for a single quarter-end (rather than for two successive quarters), then the trigger would need to increase to £12Bn for this more volatile measure to have a 30% likelihood of applying.

The USS Executive has also provided us with information on what self-sufficiency deficit would arise with a 30% chance. We have included this in the table for reference, and comment further on self-sufficiency in Appendix 3.

Please note that all information provided by the USS Executive has been provided on a “non-reliance” and for information basis, and we have been unable to check the validity of the figures. Their modelling uses 2,000 stochastic simulations and bespoke assumptions for asset returns, variances, and correlations. We envision that information will be provided more formally (and in a form that can be shared) as part of the USS Trustee’s response to any proposal.

As a technical point, the modelling does not allow for the recalibration of the Technical Provisions on an annual basis. This is difficult to model, and we believe would not have a material impact on the modelling results, but a proposal that incorporates this feature would we believe give stakeholders more confidence that the target being measured remains relevant over the period to 30 June 2022 when the next valuation is due to be completed.

Contingent Contributions – endurability

Proposal: Contingent Contributions apply until next valuation and need for mechanism would be reassessed following JEP Phase 2

Under the Proposal, the Contingent Contributions would only apply until the next valuation, and any future arrangement would be discussed following JEP Phase 2.

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5. Worked example – “worst case outcome”

High-level overview

Seven times out of ten, there would be no Contingent Contributions under the Proposal. For the three in ten bad outcomes where additional contributions are required, there is a range of possibilities. In this section we begin with a worked example of a “worst case outcome”, and then share some information provided on 25 February by the USS Executive on the potential implications.

“Worst case outcome” for contribution rates ahead of next valuation

Starting contribution (from 1 October 2019) is 29.2% of pay.
If the rebate were shared 65:35, then this would result in employer contributions of 20.1% and employee contributions of 9.1%.

Suppose the valuation is signed off in June (i.e. ahead of 30 June statutory deadline). The new contribution rate can be implemented in time for 1 October 2019, replacing the October step-up due under the 2017 valuation.

First step-up: New contribution (from 1 April 2020) is 30.2% of pay.
If the rebate were shared 65:35, then this would result in employer contributions of 20.7% and employee contributions of 9.5%.

The threshold could be breached for the first two quarters of 30 June 2019 and 30 September 2019. If the JNC does not decide an alternative outcome, the first contribution increase would apply 6 months later i.e. from 1 April 2020 (coinciding with the next step-up that would have been due from the 2017 valuation).

Second step-up: New contribution (from 1 April 2021) is 31.2% of pay.
If the rebate were shared 65:35, then this would result in employer contributions of 21.4% and employee contributions of 9.8%.

If the trigger is still breached in the lead-in to the anniversary of 1 April 2020, then the contribution rate increases to 31.2%.

Third step-up: New contribution (from 1 April 2022) is 32.2% of pay.
This coincides with the Upper Bookend used for the Proposal, leading to employer contributions of 22.0% and employee contributions of 10.2% assuming 65:35 default cost-sharing were used.

An actuarial valuation is due as at 31 March 2021. (Potentially it could be brought forward to 31 March 2020 to take on board JEP Phase 2 recommendations, although conditions may be worse at 31 March 2020 than at 31 March 2021). This has a statutory deadline of 30 June 2022.

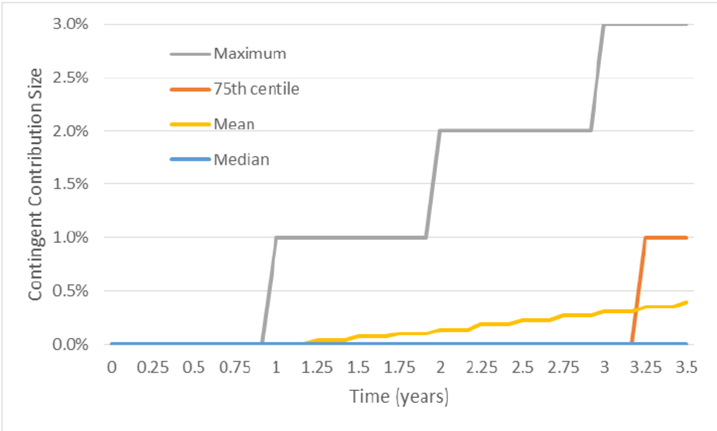
If the trigger is still breached in the lead-in to the anniversary of 1 April 2021, then the contribution rate increases to 32.2%. This would be payable for up to 3 months before the statutory deadline for the 2021 valuation of 30 June 2022 – although realistically it would take some time to put in place a new contribution rate (3 months, say), meaning that the third step-up could be paid for 6 months say before the (post JEP Phase 2) 2021 valuation outcome is applied. It is also possible that the position will have worsened sufficiently that the USS Trustee decides that contributions in excess of 32.2% are needed for the 2021 valuation.

Contingent Contributions over time

On 25 February, we were provided with some analysis of the Proposal by the USS Executive which we believe helps show the potential implications of accepting the Proposal. The approximate modelling is based on conditions at the valuation date of 31 March 2018. (The modelling also adopted a Lower Bookend of 29.7% rather than 29.2% although this has minimal impact on the analysis).

We begin by sharing a chart that shows the distribution of Contingent Contributions that would apply for the Proposal over time

Figure A.2. Evolution of the distribution of contingent contributions over time. The chart shows the mean, median, maximum and 75th centile contribution levels over time.



Notes:

- The distribution of outcomes shown by the USS Executive is highly skewed, with a minimum of zero, and a "maximum" like our worst-case example above.
- The USS Executive also showed the "median" contribution, which is zero. This is correct: if the trigger only applies in 30% of case, then the 50:50 outcome is clearly 0.
- The "mean" contributions are also shown. We believe this is not as useful as the median for showing the "average contribution" due to the highly skewed distribution. We would expect this again to be close to zero, as in most scenarios the Contingent Contributions are not needed.
- Collecting higher levels of contingent contributions on average would require either having a higher probability of triggering (which takes us into the position where we are double counting because of the Trustee's use of the 67th percentile for setting the Technical Provisions), or a higher level of contribution once triggered (here we believe steps of 1% are appropriate).

Probability of contributions applying

The following table provided by the USS Executive shows the probability of contributions applying over the whole period, which has been taken as 3.5 years. The 3.5-year period takes into account when the 31 March 2021 valuation may be signed off (the statutory deadline is 30 June 2022).

A summary of some key probability statistics from the stochastic analysis is given in Table 4.

Table 4: Summary of the probabilities of contingent contributions being payable over 2,000 scenarios.

Measure	Outcome
Probability that **contingent contributions of any size** are being paid **in 3.5 years' time**	0.26
Probability that maximum level of contingent contributions are being paid **in 3.5 years' time**	0.02
Probability that contingent contributions start and then stop during the **first 3.5 years**	0.02
Probability of triggering contingent contributions **at any time in 3.5 years** even if it is only temporary (cumulative probability)	0.28

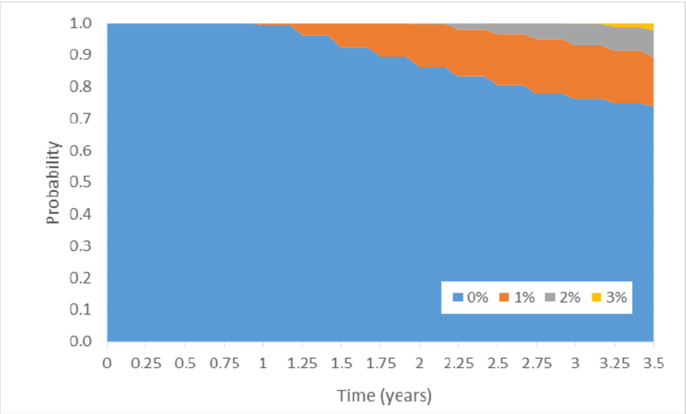
Notes:

- The final figure in the table should be c.30%, and we assume the small difference is caused by the deficit trigger being rounded to £10Bn.
- Over the period considered, there is only a 2% chance that the maximum contributions apply. This is due to the 6-month notification period and then step ups applying annually, such that the trigger needs to be hit almost immediately for there to be time for the third trigger to apply ahead of the next valuation being signed off.
- There is only a 2% chance that Contingent Contributions apply but are then switched off by the end of the period (i.e. if the position gets back on track to the anticipated position). With 350 participating employers with their own payroll systems, "false positives" would be costly from an administrative point of view, and it is necessary that this figure should be very small for a Proposal to be credible.

Probability of paying CCs of different sizes over time

The following chart provides some more colour on the probability of paying Contingent Contributions over the period considered.

Figure A.1. Probabilities of paying contingent contributions of different sizes at future times.

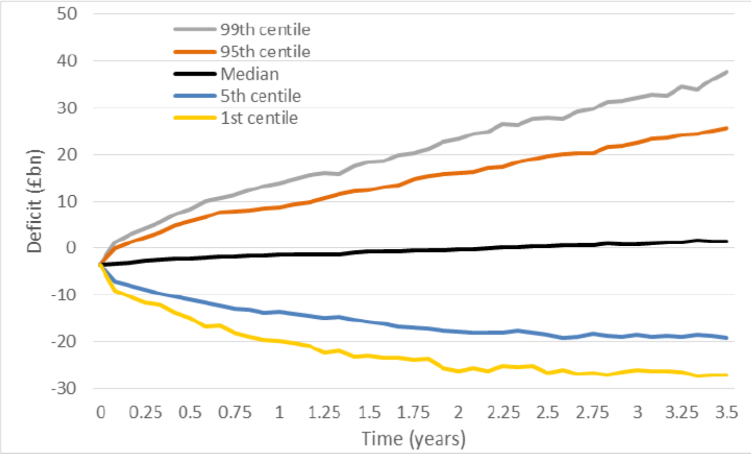


Note: This further demonstrates that under the Proposal there is a limited probability of the third trigger applying. We believe this is sensible as it would be somewhat disruptive for the joint contribution rate to change four times (to 29.2%, 30.2%, 31.2% and 32.2%) before the next valuation is signed off, noting that it has only changed four times in the last 44 years.

Evolution of distribution of deficit

The following chart shows the funnel of doubt for the deficit (gilts plus proxy) over the period considered.

Figure A.6. Evolution of the distribution of the deficit over the analysis horizon. (Note that a deficit is indicated by a negative number, a surplus by a positive number).



Notes:

- The chart shows that on the gilts plus proxy approach, there is a 1% chance of a Technical Provisions surplus of nearly £40Bn or more at the end of the period, and a 1% chance of a Technical Provisions deficit of nearly £30Bn or more.
- While the simplified nature of the proxy approach will over-state the volatility of the current Technical Provisions measure, the funding position (being difference between two large numbers) is clearly volatile. The valuation and investment approach will we understand be further reviewed by the JEP, noting that alternative valuation or investment approaches could reduce the variability.

Sensitivity with 10% probability of payment

We also share some information provided to us by the USS Executive on the sensitivity to using a 10% probability rather than a 30% probability.

Table A.1. Sensitivities to changing key parameters (changed parameters highlighted in ***red****).*

Trigger Threshold (£bn)	Expected total contingent contributions over 3.5 years (£m)*	Expected total contingent contributions over 3.5 years (% of salary)*	Cumulative probability of contingent contributions being payable at any time in 3.5 years
10	40	0.1%	0.3
18	10	0.02%	0.1

*Total over 3.5 years, averaged over all scenarios.

Note: Here, the expected total contingent contributions are very low – although again we note that the "mean" contribution is not the most useful statistic for what is a very skewed distribution.

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6. Comments on draft Statement of Funding Principles

Comments on draft Statement of Funding Principles

We have reviewed the draft Statement of Funding Principles for the 31 March 2018 valuation included in the 2 January 2019 consultation.

This sets out the "principles" for funding the scheme, as well as the detailed assumptions for the valuation.

The assumptions are set using best estimate principles except for mortality (where some explicit prudence is included), and the discount rate (where a 67th percentile is adopted along with an assumed program of "de-risking" albeit de-risking is already incorporated into the "current" investment strategy through the Statement of Investment Principles).

We set out our initial thoughts on the assumptions in our 14 January 2019 note. Overall, we observe that the proposed assumptions for the bookends do not fully reflect all the JEP recommendations, and we recommend asking the USS Trustee to provide further commentary on why this is the case as part of the consultation response.

Turning to the detailed drafting of the Statement of Funding Principles, we have two comments:

- Compared with the draft Statement of Funding Principles for the 2017 valuation, there is some additional wording about the Trustee monitoring the short-term self-sufficiency position. This wording also seems to have been incorporated into the final version of the 2017 SFP without any consultation of UUK. We have no material concerns with the USS Trustee documenting that it is monitoring the self-sufficiency deficit, although would prefer this monitoring to have no role in the Proposal.
- The "economic basis" has been dropped (i.e. it is no longer defined, unlike for the 2017 and 2014 statements). This may suggest that the USS Trustee is disbanding Test 3 which compared the net assets of the sector with the deficit of the scheme on an economic basis together with a 1-in-100-year bad event, or the approach could be retained but on a self-sufficiency basis. We suggest checking this with the USS Trustee in due course.

7. Closing thoughts

Where next	Working with UUK, we have developed a Proposal for Contingent Contributions. In our view it is a credible proposal which balances the desire of the USS Trustee to begin to collect and to establish higher contributions if the funding position deteriorates ahead of the next scheduled actuarial valuation, with the desire of employers and employees of having a degree of certainty each year about what contributions are likely to be needed. We would be pleased to discuss this further. We have given permission for this paper to be shared with participating employers in the USS.
Compliance	The advice in this report and the work relating to it complies with ‘Technical Actuarial Standard 100: Principles for Technical Actuarial Work’ (‘TAS 100’) and 'Technical Actuarial Standard 300: Pensions’ (‘TAS 300’). The paper should be read alongside our advice dated 14 January 2019 (“USS Actuarial Valuation at 31 March 2018 – Initial Thoughts”).

Appendix 1 – Interaction with the JEP Report

Interaction with the JEP Report

The JEP report recommended that contingent assets be considered as part of Phase 2 of their work, and not part of the JEP's suggested approach to conclude the 2017 actuarial valuation.

- *"While the recommendations for this phase of work do not investigate the role of contingent assets or negative pledges, this may be an issue that merits future investigation."*
- *"We note that in their evidence to us and in the pre-September 2017 consultation on deficit recovery contributions, the Trustee had proposed that a lower level of DRC should be linked to the availability of trigger contributions (i.e. contributions that would be available to the Trustee if DRCs proved to be inadequate). However, we conclude that that is an issue to be addressed for the longer term, and as part of a wider review."*

The above is, we believe, the current position of many employers. However, employers also accepted that in endorsing the JEP recommendations, there may be a need to demonstrate "tangible support" that the USS Trustee has indicated it will require to support greater risk-taking by employers.

Aon view of JEP position

In our view, we believe the JEP position on not requiring Contingent Contributions to deliver their recommended contribution rate for the 2017/2018 valuation is reasonable, because:

- The USS Trustee benefits from a Unilateral Contribution Rule, and could at any time call an additional valuation to reset contributions.
- The USS Trustee benefits from a Last Man Standing structure which automatically protects against the covenant of individual institutions.
- In our wider experience, Contingent support tends to be used where the covenant is not strong. However, the covenant has been professionally rated as "Strong" by the USS Trustee's covenant advisers, with a long horizon of visibility of 30+ years.
- The long-term visibility of covenant, and cost-sharing nature of contribution increases under the JNC default mechanism, mean that it is reasonable for the Trustee to endeavour to keep contributions stable. There have only been four changes to contribution rates since the scheme was set up in 1975. While there have been changes to the funding regime in this time, the stability suggests to us that even changing contributions every three years may be a "rapid response" by historical standards.

UUK request

Noting the USS Trustee's position, and the Pensions Regulator's position – and notwithstanding the JEP view above – UUK has requested that we help develop a Proposal in the spirit of finding a way forward that all stakeholders may find acceptable.

Appendix 2 – USS Trustee's 11 principles

High-level overview	We set out below how the Proposal is consistent with the USS Trustee's 11 principles.
1. Efficacy	*The structure of any contingent contribution arrangement should be practical, transparent, unambiguous and as simple as possible.* We believe that the Proposal is practical (for example the trigger metric can be readily calculated as needed), transparent (in that they link back directly to contribution funding measures), and as unambiguous and simple as practical, given how we have arrived at this position.
2. Objective metric	*The metric that is used to trigger contingent contributions should be objective and not require subjective judgments, interpretations or a decision-making process.* For reasons set out earlier, we believe that the Technical Provision basis is the most valid measure to use in considering whether additional contributions are required. With our proposed compromise of using a proxy method that is reset annually, we believe that no additional subjective judgments would be needed (noting that the Scheme Actuary must provide an annual actuarial update and so this should not be viewed as additional subjective judgment).
3. Alignment	*The mechanism for triggering contingent contributions should be sufficiently sensitive to data that could signify that current contributions may not be adequate.* We believe that by looking at the Technical Provision calculation we are more aligned to the "the underlying reason or concern" – i.e. a worsened funding position on the Statutory Funding Objective.
4. Robustness	*The mechanism for triggering contingent contributions should be robust in the sense it is not triggered solely in response to short-term market volatility.* The Technical Provisions Deficit is averaged over three successive month ends, and then must exceed the Threshold over two successive quarter ends. This is a minimum of 6 months of data for the Technical Provision Deficit to be assessed, which we believe is a reasonable balance between picking up trends, as opposed to picking up market noise. While it might be considered desirable to look at averaging over a longer period – say a full year – this would lead to a delay of over 18 months before increased contributions are applied, which we believe stretches credibility.

5. Safety valve	*Contingent contributions once triggered should be terminated over a reasonable period should data suggest that they are no longer needed.* The Proposal sets out clear principles and measurement criteria under which planned increase in Contingent Contributions would be suspended and Contingent Contributions would cease in their entirety, if there has been a subsequent improvement in financial conditions (as explained in Appendix 3).
6. Materiality	*Contingent contributions once triggered should be sufficiently material such that, if they were sustained over the long term, they would substantially improve the funding position in adverse scenarios.* If the contribution rate increased by 3% (i.e. the third step is activated), then this is worth around £250M p.a. or around £400M p.a. allowing for the deficit contributions within the Lower Bookend. If sustained over the long term, and noting the covenant is visible for 30 years based on the covenant assessment, then this would clearly substantially improve the funding position in adverse scenarios. The USS Trustee also has the three-yearly actuarial valuation process to further refine contributions (as well as the ability to call an early valuation).
7. Quantum	*In adverse scenarios in which contingent contributions are triggered, the aggregate quantum of the contingent contributions should be <u>broadly similar</u> to the Trustee's contribution requirement in the absence of contingent arrangements over a reasonable period of time.* Our interpretation of this principle is that in an adverse scenario, where Contingent Contributions have been triggered and all three steps have applied, the Contingent Contributions should be equal to the difference between the Upper and Lower Bookends. The USS Trustee's latest paper of 7 February suggests that it may require contributions to go above the Upper Bookend, in effect to ensure that the under collection of contributions in the early years is made good. We believe it is important to avoid over-engineering the approach, given that the amount of underpayment (potentially £1Bn over 3 years as mentioned earlier) is small compared with normal market movements. The concept of "broadly similar" needs to be in the context of these normal market movements. In addition, the proposed Upper Bookend comes with a relatively prudent recovery plan given the unique long-term covenant. So, there would be flexibility to make good any small underpayment (following a rebate, and with triggers then applying) by a slight extension of the recovery plan, thereby ensuring that the total contributions are broadly similar to what would have been paid without a rebate, over a reasonable period of time.

8. Durability	*The contingent contribution arrangement should remain in place until a revised Schedule of Contributions comes into force following a future valuation.* The Proposal does this. As noted above, a three-year contingent contribution cycle will have a triennial valuation that commences during its operation, after which contributions will be “reset” – formally re-assessed.
9. Covenant	*The contingent contributions should be consistent with the findings of the most recent review of the employers’ covenant.* The sizing and timing of Contingent Contributions is appropriate to the covenant results at the most recent covenant review – stepping up contingent contributions over time, and with a cap on to the maximum size of contingent contributions. Therefore, the Proposal meets this principle.
10. Legally binding	*The contingent contribution arrangement should be legally binding and documented as part of the Schedule of Contributions* We would expect this to be the case and that any consequential need to notify employers and members of contribution increases would be factored into the required documentation. The parties would need to take legal advice on how this can be best accomplished.
11. Payment certainty	*The Trustee must be sufficiently comfortable that contingent contributions would be paid in full if triggered.* The Proposal, if supported by employers with the formal support of the USS Trustee and the Pensions Regulator, would lead to Contingent Contributions being paid, when triggered, on a timely basis. This is subject only to the JNC having the chance to make an alternate decision.

Appendix 3 – Detailed aspects of the Proposal

Purpose of Appendix

This Appendix sets out some of the more detailed aspects of the Proposal.

Deficit vs overall contributions

We have considered whether the trigger event should relate to the deficit, or the overall contributions payable. We believe the simpler approach of focusing on the past service deficit is appropriate. It is consistent with the main difference between bookends being due to the deficit payments, and avoids having to codify how the deficit payments would evolve based on a difference in deficit.

Self-sufficiency

It is clear from discussions with the USS Executive that they favour the USS Trustee adopting the self-sufficiency basis rather than Technical Provisions.

The self-sufficiency basis is a “gilts plus” type of calculation – but the “plus” is not a fixed amount and requires subjective judgment on the part of the USS Trustee. For example:

- The USS Trustee updated its calculation of self-sufficiency from using a discount rate of gilts + 0.5% p.a. in 2014, to gilts + 0.75% p.a. in 2017, equivalent to a change of around £4Bn in the self-sufficiency target. Arguably it could review the 0.75% more often, in the light of changes in long-term returns on the asset categories that would comprise the self-sufficiency portfolio.
- The USS Trustee also exercised subjective judgment in updating the mortality assumption inherent in the self-sufficiency portfolio for the 2018 valuation.

In short, there is little about funding unknown future liabilities that does not require subjective judgement and interpretation.

The USS Trustee’s investment policy does not incorporate material hedging of interest rate and inflation exposures – because of their oft stated conviction about the path of future interest rates. But the use of self-sufficiency measure carries high amounts of these elements.

The USS Executive state that this can be partly addressed by taking a 40-day rolling average of the self-sufficiency deficit, which reduces volatility by c.90% compared with taking daily rates. Unfortunately, this reduction in daily volatility does not translate to a similar reduction in volatility over longer periods. Based on information provided by the USS Executive on daily deficits on a self-sufficiency basis between 31 March 2017 to 31 December 2018, the unsmoothed daily deficit has varied between about £16.5Bn and £26.5Bn. And the 40-day rolling average has varied between about £17.9Bn and £23.7Bn.

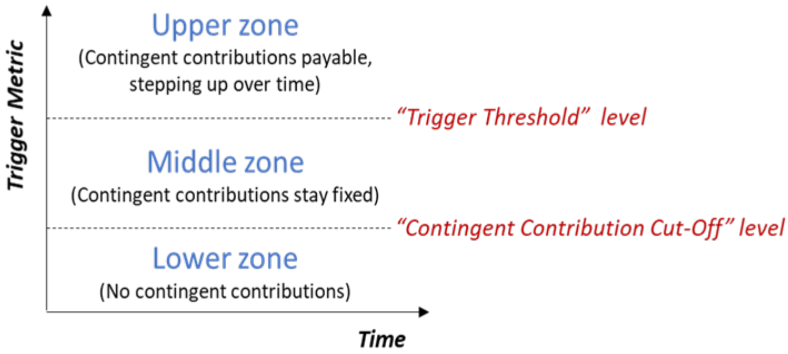
The self-sufficiency basis could be used as an alternative to the gilts plus proxy version of Technical Provisions, however this would miss the opportunity for the Technical Provisions to be recalibrated on an annual basis as part of the annual actuarial report which we believe may provide the stakeholders with more comfort that the trigger metric is credible.

Annual review process

Proposal: Annual review process using three zones suggested by USS Executive

We were comfortable with the mechanism outlined by the USS Trustee where an annual check is carried out, and contributions are then either increased, held level, or suspended.

Three zones are proposed for the overall approach as follows:



Source: The diagram is taken from the USS Trustee's 2 January 2019 consultation paper

Upper zone: If the Trigger Metric stays in this zone for a minimum period then Contingent Contributions will kick-in and increase in predefined steps up to the Maximum Contingent Contribution.

Middle zone: If the metric is in this zone for a minimum period then Contingent Contributions remain fixed (if they are zero they remain at zero, if they are 1% they remain at 1%).

Lower zone: If the metric is in this zone for a minimum period then Contingent Contributions are reduced to zero.

For the Proposal we suggest that the funding level is tested at the two quarter-ends preceding the anniversary of Contingent Contributions coming into place.

- If the average remains above the trigger threshold level, then contributions step up (an extra 1%), up to a maximum of the Upper Bookend.
- If the average is between the anticipated position (how we are defining the "Contingent Contribution Cut-off" level in the diagram above), and the trigger threshold level, then the current level of Contingent Contributions is paid.
- If the average is in line or lower than the anticipated position, then Contingent Contributions are switched off.

How trigger metric monitoring works in practice

- ***Frequency of monitoring: Quarterly monitoring for the funding level.*** This would increase the frequency of monitoring by a factor of around 10 compared with three yearly valuations being used to make contribution decisions. We believe this strikes a reasonable balance between more frequent monitoring, and not over-engineering the approach.

- ***Smoothing: Each quarter-end funding level is calculated as the average of the three month-ends leading up to the quarter-end.*** This provides some protection against stakeholders feeling aggrieved that a particular date was "unlucky" (particularly if the position the improves again during the notice period), without seeking to over-engineer the approach.
- **Period over *which breach must be maintained: Two successive quarters.*** Funding positions can be very volatile one quarter to the next. One quarter where a trigger is breached may be followed by subsequent quarters where the position reverses. Any triggering needs to be sufficiently well established before additional contributions are payable. However, we also need to be mindful that with a 6 month notice period already preferred, we could introduce too long a delay that would cause the Trustee to believe the structure is not worth enough. For the Proposal, any trigger should be breached over a period of <u>two</u> consecutive quarter ends, before the Trigger Event is deemed to have occurred.

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About Aon

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