Methodology and risk appetite for the 2020 valuation

Technical discussion document for

USS sponsoring employers

Issued 9 March 2020

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Executive Summary

This document sets out, for discussion, our emerging thinking on the proposed methodology for the 2020 valuation and the key factors that will drive the outcome. It follows feedback from our stakeholders, lessons learnt from the previous valuation, a fundamental review of our methodology, and the Joint Expert Panel's (JEP) second report.

In order to encourage and focus discussions, we have set out our emerging approach to the methodology and investment strategy. We also set out the two key factors – the covenant and risk appetites – that will have the greatest effect on outcomes, whatever the methodology.

This document is specifically addressed to our sponsoring employers (when we refer to 'you'). Your views on the issues it covers will influence the approach we subsequently decide to take and will help us make clear, understandable and evidence-based decisions. It will, however, be available on our website for everyone to read.

We have not made any decisions at this early stage in the process. We are seeking to encourage discussion and to build understanding and evidence to inform our approach.

In support of this, a Valuation Methodology Discussion Forum (VMDF – see Appendix A) has been meeting regularly since February. This engagement has been valuable, as we know there are different perspectives and differences of opinion. While we are presenting a possible methodology, which has been informed by the JEP and which is broadly acceptable to us, we will consider alternative approaches with an open mind. We hope that setting out our perspective and emerging position on the key issues will inform and support discussions.

Note that this discussion document is separate from, and in advance of, the formal consultation we are required by law to undertake with UUK later in the year.

Methodology

In reviewing the methodology, we first established a set of high-level principles. These were shared with the JEP and at last year's Institutions' Meeting. They have guided our approach:

- *Principle 1:* **The level of risk must be 'acceptable'**
  How much reliance can we, and you as employers, place on the covenant? How can we ensure the Scheme can recover from an adverse investment scenario if required?
- *Principle 2:* **Long-term *and* short-term perspectives are important**
  Can we ensure there is a viable long-term outcome from the valuation that delivers a sustainable Scheme in the best interests of our members? Can we track things over the short-term to check that we are on course to achieve that long-term goal?
- *Principle 3:* **Intergenerational fairness should be considered**
  In terms of the contributions and benefits members will pay and receive, now and in future.

Alongside these principles we have identified a number of key considerations: the trade-off between **simplicity and complexity**; the **extent to which costly guarantees are desirable**; the **extent to which stability of outcomes is achievable,** noting that stable benefits, stable contributions and stable risks are **not** compatible**;** and **the need to ensure our statutory, regulatory, and fiduciary duties as Trustee are met.**

This document addresses three key aspects of the methodology: covenant, risk appetite and the investment strategy. It includes consideration of a dual discount rate approach (see Section 2)**,** as recommended for consideration by the JEP. The potential benefits of the approach we set out include providing:

- a more stable risk and investment profile;
- a more accurate reflection of our view of stakeholder risk appetites;
- alignment with new emerging regulatory requirements; and
- consistency with the evolving maturity of the Scheme.

A dual discount rate approach is more likely to lower the contributions needed to fund future pension promises than a single discount rate approach (all things being equal). It may also lead to greater stability of contributions over time.

Covenant, risk appetite and investment strategy

The covenant is our sponsoring employers' legal obligation and financial ability to support the Scheme now and in the future. It informs how much we can rely on them, collectively, to fund the pension promises they have made, and continue to make, to our members. It remains the foundation of the valuation: the stronger the covenant, the more risk we can consider taking in the investment strategy, which can lower the regular contributions we need.

The covenant is currently rated **'strong'**, but it is on negative watch. This is due to the risks of potentially higher debt levels in the sector and strong employers leaving the Scheme. If all the covenant measures discussed during the 2018 valuation are put in place (see Section 3), we expect it to remain 'strong'. Otherwise, we expect it to be downgraded to 'tending-to-strong'.

This would change the period over which we could rely on the covenant in setting the investment strategy and funding assumptions from **30 years** to **20 years.** This would, in turn, lower the amount of risk we could contemplate taking (i.e., less time for risks to be rewarded and/or to recover from downside events).

One of the ways we've looked at the sector's capacity to support risk suggests that it could support in the region of £65bn for a 'strong' covenant (i.e., over 30 years). This would reduce to around £54bn for a 'tending-to-strong' covenant (i.e., over 20 years). These figures are only illustrative at this stage. This **'risk *capacity*'** covers all the risks being run by employers – such as debt, business investment, competition, funding, changes to higher education and other environmental factors. Not all of it would be available to support the Scheme, so we need to understand your **'risk *appetite*'**: How much are you prepared to commit to USS specifically in an adverse scenario?

Purely to illustrate the methodology, we have assumed in this document that the employers' 'risk appetite' is around £35bn for a 'strong' covenant**.** In our illustration, this would leave £30bn to cover employers' other business risks. In reality, it may be very different and we need your feedback on this.

But what would a 'risk appetite' of £35bn mean for you? It means in a sufficiently adverse scenario we would be relying on you to pay up to 10% of payroll annually over 30 years purely to cover the deficit in relation to benefits which have already been earned. This would be in addition to the cost of whatever ongoing pension provision you continue to offer.

If the covenant were downgraded to 'tending-to-strong' we assume (again, for illustration) that the risk appetite falls to around £25bn.

In terms of **investment strategy**, we are proposing an overall investment approach which is consistent with a dual discount rate.

This is based on combining a **low-risk strategy for pensioners** and a **growth strategy** (i.e., higher risk and higher expected return) **for active and deferred members** before they reach retirement. Note, however, that this separation is only conceptual. The overall strategy will take advantage of synergies and pooling benefits and will be tested and managed relative to risk appetite.

Our primary **measure of risk** in relation to funding the Scheme is the distance from 'self-sufficiency' (see Section 4.1). We are not targeting self-sufficiency. We are trying to ensure we have the ability, in a sufficiently adverse event, to secure the benefits members have already built up.

We propose a measure for consideration that combines the self-sufficiency deficit with a 'risk buffer' for how bad the deficit might get in the time it would take to move towards a self-sufficiency strategy.

Illustrating the methodology

We have produced indicative calculations to illustrate the methodology. The results are based on the same demographic assumptions used for the 2018 valuation but the financial assumptions have been updated to 31 December 2019. (Note that, since then, global concerns over the Coronavirus have caused large falls in financial markets which, if they persist, could adversely impact the valuation.)

The defined benefits USS members build up increase each year broadly in line with CPI inflation. Given the impact on gilt yields of the government's recently announced reform of RPI, we have had to make an adjustment for future CPI inflation in our illustrations (see Section 6.1). We would otherwise be understating expected CPI inflation, and hence our liabilities and the future service cost. This issue affects all UK pension schemes that provide CPI-linked benefits.

The discount rates we have adopted to illustrate the methodology are:

- For a 'strong' covenant: The pre-retirement discount rate is Gilts + 2.5%.
- For a 'tending-to-strong' covenant: The pre-retirement discount rate is Gilts + 1.75%.
- For both covenant cases: The post-retirement discount rate is Gilts + 0.75%.

The 'strong' and 'tending to strong' positions are intended to be broadly aligned to the indicative £35bn and £25bn risk appetites referred to earlier. The actual discount rates we will use for the valuation will be confirmed after we have explored the issues in this document with you. We also need to consider, in more detail, the impact of risks materialising in relation to different categories of members.

The following table illustrates the potential outcomes as at 31 December 2019 for both a 'strong' and a 'tending-to-strong' covenant under our proposed approach for the 2020 valuation. We compare these with the approach taken for the 2018 valuation.

Table: *Indicative output for Technical Provisions (TP) and future service contribution requirements as at 31 December 2019 using the proposed methodology for the 2020 valuation.*

31 Dec 2019 **New Methodology**	TP Liability (£bn)	TP Deficit (£bn)	FSC (Future Service Cost)[1]	TP Discount Rate[2] (Gilts+)	FSC Discount Rate[2] (Gilts+)	Covenant support requirement[3] in 2040 (£bn)
2018 methodology (with RPI allowance)	78.3	5.4	32.5%	1.33%	1.48%	17
"Strong" covenant	**78.0**	**5.1**	**30.0%**	**1.35%**	**1.76%**	**32**
"Tending-to-strong" covenant	**81.9**	**9.0**	**34.0%**	**1.10%**	**1.33%**	**25**

1. Future service cost (FSC) is given as a percentage of payroll.

2. The dual discount rate is expressed as a single equivalent discount rate for the purpose of comparison.

3. Covenant support requirement is given by the projected self-sufficiency deficit plus a risk buffer.

Notes: *We have expressed the discount rates relative to gilts purely for ease of comparison. They were not calculated from a so-called 'gilts+' approach, but based on our FBB model. The final column assumes gilt yields revert in line with our expectations and that the Scheme is fully funded on a TP basis. Should gilt yields remain at levels similar to those at 31 December 2019, covenant support requirements at 2040 would be considerably higher.*

These figures in the table aim to give you an indication of how your clear commitment to the scheme can, and will, have an influence. Other outcomes are possible depending upon your 'risk appetite' and your commitment to providing additional tangible and material covenant support.

Other factors will also have an influence, including our risk appetite, demographics (our current assumptions are being reviewed) and conditions in financial markets at 31 March 2020. The Pensions Regulator is also holding a consultation that could influence future valuations. We will need to consider if and how this could (or should) inform the approach for the 2020 valuation.

What we need from you

We are asking for your feedback to be sent to UUK by **5pm on 17 April** (copied to us):

1. What are your comments on the proposed new methodology? (See Section 2)
2. Do you support the measures to ensure the covenant is "Strong" agreed as part of the 2018 valuation on: i) the permanent rule change on employers exiting the Scheme to underpin a 30-year covenant horizon; ii) debt monitoring arrangements; and iii) *pari passu* security on new secured debt? (See Section 3)
3. Do you wish to consider additional tangible covenant support measures to further strengthen the covenant and potentially support additional risk (above that outlined in the scenarios presented in the table above)? (See Section 3 and Appendix C)
4. Do you have initial views on whether you would be comfortable with an investment strategy that took a moderately larger amount of risk in the long term (See Section 5)?
5. Based on the example approach to managing risk, as set out in this document, what is your risk appetite? In other words, do you have initial views as to how much of your risk capacity you are comfortable for us to rely on in supporting the Scheme, in the knowledge that there are adverse scenarios in which this may be called? (You may wish to express this as a contribution of *x*% of salary, or a monetary amount, paid over *y* years.) (See Section 4)

The rest of this document provides more detail on the points we've covered above. Your answers to these questions will inform the assumptions we will consult UUK on in the summer.

1. Introduction

This document sets out our emerging thinking on the proposed methodology for the 2020 valuation and the key factors that will drive the outcome.

It follows feedback from our stakeholders and a fundamental review of our methodology. It sets out the changes we propose to make to the methodology and the investment strategy.

It also sets out two key factors: the covenant and risk appetites. These factors will have the greatest effect on the outcome, whatever the methodology.

It is specifically addressed to our sponsoring employers (when we refer to 'you') as your views on the issues it covers will influence the approach we take and will ensure we are making clear, understandable and evidence-based decisions. This reflects our commitment to the Shared Valuation Principles agreed with our stakeholders, available here. We are also making this document available on our website for everyone to read.

Note that this discussion document is separate from, and in advance of, the formal consultation we are required by law to undertake with UUK later in the year (see below).

1.1 A reminder of the 2018 valuation

The 2018 valuation reported a £3.6bn deficit in respect of promised pension benefits that members have already built up. At 31 March 2018, assets were £63.7bn, liabilities were £67.3bn and the Scheme was 95% funded.

During the valuation, we discussed steps to reinforce the covenant – debt monitoring, *pari-passu* arrangements covering new debt to third parties, and a rule change on employer exits (currently in place as a moratorium) – and this had a significant influence on the outcomes.

The valuation resulted in a contribution rate of 28.7% to cover future defined benefits, as well as defined contributions and expenses. There was also a contribution of 2% to address the deficit (rising to 6% from October 2021).

So, the total contribution required was 30.7%, rising to 34.7% from October 2021.

The rate of 30.7% has been paid since 1 October 2019, with employers paying 21.1% and members 9.6%.

1.2 Why we are carrying out a 2020 valuation

We need to re-assess the Scheme's funding and the plan to improve it.

Economic conditions during the 2018 valuation were challenging and volatile. So, we committed to carry out another valuation in 2020 – a year earlier than the law requires.

We will base the 2020 valuation on a 'snapshot' of the Scheme on 31 March 2020. If it shows that the Scheme might not have enough money, we must put a plan in place to improve its funding. The process itself will run well into 2021. The legal deadline for completing a valuation is 15 months after the 'snapshot' is taken (see Section 9).

1.3 Indicative outcomes

We have produced a range of indicative outcomes from applying the methodology proposed (see Section 7). Your views will affect the final result.

These are based on analysis at 31 December 2019. They are **not** predictions of the outcome of the 2020 valuation. They show the effect of different methodologies and risk appetites, and how your views will influence the results.

The final outcomes will depend on your feedback, and updated information at 31 March 2020 including economic conditions and outlook.

Note that the results are based on financial assumptions as at 31 December 2019 and that, since then, concerns over the Coronavirus have caused large falls in financial markets which, if they persist, could adversely impact the valuation.

1.4 What we need to discuss now

We have set out the factors that we believe will have the greatest bearing on the outcomes of the valuation and on which we need your clear and unequivocal views.

The key questions we need you to consider and provide feedback on are set out in Section 8.

You are asked to provide your feedback by **5pm on Friday 17 April 2020.** Please send these to pensions@universitiesuk.ac.uk so that UUK, as the Scheme's formal employer representatives, can compile a sector-wide response. Please also share your responses with us at valuation@uss.co.uk so they can be passed on to the Trustee Board.

We will then formally consult UUK on the Technical Provisions, the Schedule of Contributions and the Recovery Plan. We plan to do this over six weeks in July and August so that we can complete the valuation on time (see Section 9).

- For more about what valuations involve, watch our film Valuations: how we protect the promises made to members.
- For an overview of the roles and responsibilities of different parties in carrying out a valuation, watch our film Roles & Responsibilities.

2. Methodology

In practice, **an actuarial valuation is a 'budgeting' exercise** in which we consider how existing assets, future investment returns, and contributions are planned to pay all the benefits promised by our sponsoring employers to our members within the DB section of the Scheme.

There are three key outcomes to a valuation:

> **The Technical Provisions ("TP"):** An estimate of the assets we need to pay the pensions already promised based on prudent assumptions for future investment returns.
>
> **The Recovery Plan:** A plan to address any funding shortfall (deficit) identified as at the valuation date in a set amount of time through the payment of deficit recovery contributions ("DRC").
>
> **The Contributions:** The contributions we need for the Recovery Plan plus the contributions we need to be able to fund future pension promises.

The methodology is how we use information about our members, our sponsoring employers, the Higher Education sector as a whole, global financial markets, and the global economy to set the 'budget' that determines the outcomes.

While the methodology is important, the information that goes into it has the greatest bearing on the outcomes – but our methodology has been a key talking point over the course of the last two valuations.

In advance of the 2020 valuation, we have reflected on the feedback we have received from our sponsoring employers and members, and this has led to a fundamental review.

2.1 What was the approach taken for the 2017 and 2018 valuations?

In high-level terms, the last two valuations were conducted on the following basis:

- The amount of investment risk we *considered* taking was based on our view of the covenant (informed by analysis from our covenant advisors, PwC and EY Parthenon).
- The amount of risk *taken* was based on extensive discussions with employers over how much risk they wanted to be exposed to (your *risk appetite*), particularly in 20 years' time.
- That outcome for risk appetite in 20 years ('Test 1') essentially determined the investment strategy. The investment strategy resulting from the 2018 valuation involved a derisking transition over 20 years from c. 65% growth assets to one in which (if interest rates were to rise as anticipated) we could hold as little as c. 20% growth assets.
- The investment strategy (and market outlook) determined the expected investment return.
- The expected investment return, less a margin for prudence, determined the discount rate and hence the funding position of benefits already built up (**the Technical Provisions**).
- The funding position and prevailing market outlook determined the Recovery Plan and the required contributions.

2.2 A fundamental review: our approach

In summer 2019, the Trustee Board considered the lessons learnt from the 2017 and 2018 valuations, informed by the conclusions of the first report from the JEP.

This led to the creation of a Methodology Working Group (MWG) involving members of the Board, the Executive, the Scheme Actuary and external advisors.

This group has carried out a fundamental review of the methodology and, as a result, we are considering taking a different approach for the 2020 valuation.

We have been discussing the emerging approach with our stakeholders since January.

A Valuation Methodology Discussion Forum (VMDF) involving our MWG and representatives from UCU and UUK (including their advisors) has been meeting since early February.

The VMDF has had thorough discussions on methodology and provided useful alternative perspectives. Further meetings of the VMDF are planned in March and April (see Appendix A).

2.3 Our guiding principles for the methodology

Our review of the methodology has been guided by a set of high-level principles that were shared with the JEP in September and with you at December's Institutions' Meeting. These principles serve to guide the formulation of the methodology for the valuation, but no decisions have been taken at this stage. They are:

Principle 1: **The level of risk must be "acceptable"**

- Reliance on the employers' covenant must be acceptable to the Trustee (which means within our risk appetite as Trustee and within the risk *capacity and appetite* of our sponsoring employers).
- The covenant must be able to make good any funding shortfall if investment returns are lower than we expected.

Principle 2: **Long-term *and* short-term perspectives are important**

- Long-term: The valuation must lead to a viable long-term outcome. A sustainable Scheme is in the interests of our members.
- Short-term: What happens in the short-term must not jeopardise the long-term goal. In particular, we must check that, regardless of short-term investment volatility, the Scheme remains on track for the long term.

Principle 3: **Intergenerational fairness should be considered**

- Fairness in terms of input (i.e. cost) should be considered.
    - Should all generations pay the same contributions?
    - Should future service contributions reflect current cost or be averaged?
    - Should members contribute to recovering a deficit?
- Fairness in terms of output (i.e. benefits) should be considered.
    - Should all generations receive the same benefits?

2.4 Key considerations

In addition to the principles set out above, there are some specific considerations that need to be taken into account when considering the methodology:

- **There can be a trade-off between simplicity and complexity:** We want to strike an appropriate balance between the need to take account of the particular nuances of the Scheme whilst making the approach as simple and as transparent as possible.
- **Guarantees are desirable, but costly:** The cost of the guarantees in the Scheme's benefit structure (defined benefit pension promises are protected by law) needs to be captured. The fewer the guarantees, the greater the flexibility in valuation and funding.
- **Stability of outcomes is desirable** but stable benefits, stable contributions and stable risk levels are not compatible and require trade-offs.
- **Regulatory requirements:** including prudence, integrated risk management and a long-term objective (LTO) for funding, the last of which will be a requirement for DB schemes once the Pension Schemes Bill 2020 passes into law.

2.5 Initial findings from the methodology review

Our review of the methodology, together with feedback from the JEP in their second report and discussions with stakeholders, have led us to consider an approach for the 2020 valuation that is more aligned with the Scheme's specific economics and demographics.

It is also simpler in terms of understanding and reflecting your position on risk.

Changes proposed to the methodology relative to that used in 2017 and 2018 include:

- Considering alternative ways of assessing the covenant to further inform the employers' risk capacity.
- Reflecting different perspectives on risk – employers, members and the Trustee.
- Determining an investment strategy that is better aligned with risk appetite.
- Using a 'dual discount rate' approach aligned with the choice of investment strategy.
- Replacing "Test 1" with a 'check' that risk is within appetite.

In high-level terms, we propose for the purpose of this discussion to conduct the 2020 valuation on the following basis:

- The maximum amount of investment risk *considered* will be based on a **refined** view of the strength of the covenant (informed by analysis from our covenant advisor, PwC).
- The amount of risk *taken* will be **actively managed**: relative to the covenant and the amount employers **demonstrate** they are willing to support on an **ongoing basis** over the next 20-30 years (see Sections 3 and 4).
- A relatively high-growth investment strategy will be taken for the proportion of pre-retirement (active and deferred) members before they reach retirement, while a lower-risk investment strategy will be taken for the proportion of retired members. The overall investment strategy will be adjusted so as not to lose the synergies and other benefits of the combination of the two.

- The investment strategies (along with the investment market outlook) will determine the expected investment returns for pre- and post-retirement periods.
- These two expected investment returns, less margins for prudence, will determine the dual discount rates corresponding to pre- and post-retirement periods.
- These dual discount rates will in turn determine the aggregate funding position (**the Technical Provisions**).
- The funding position and prevailing market outlook will determine **the Recovery Plan.**
- The investment strategy, which drives discount rates, will determine **the contributions** needed to fund future pension promises.

The benefits of a dual discount rate approach

The use of dual discount rates would bring several benefits:

- It broadly reflects our views of where employers are typically expected to take risk in respect of the membership (see Section 4).
- It can be aligned with the Long-Term Objective (LTO) approach expected to be introduced under legislation, giving sensible answers as the Scheme matures and the proportions of pre- and post-retirement members change over time.
- It aligns with our choice of investment strategy and supports the need to remain within risk appetite.
- It leads to a lower future service cost (all things being equal) than a single discount rate approach, and is likely to lead to lower future service contributions and greater stability of contributions over time.

2.6 What goes into the methodology?

At the start of this section we said that the information that goes into the methodology has the greatest bearing on the outcome. We cover the 'key inputs' to the methodology in dedicated sections of this document but provide a summary here for context.

How the covenant affects the valuation (see Section 3)

The covenant is an extremely important input and the foundation on which the valuation is based.

The covenant can be defined as the collective financial ability and willingness of our sponsoring employers to support the Scheme now and in the future.

It reflects how much we can responsibly **rely** on them financially to secure the pension promises they are making (and have made) to our members.

The stronger the covenant, the more we can rely on it in our investment strategy and funding assumptions. That is, we can be more confident that a deficit can be made good if investment returns are lower than we expected.

As such, the covenant reflects the collective capacity of our sponsoring employers to take investment and other risks in funding the Scheme.

During the 2018 valuation, we discussed steps employers can take to protect the covenant – debt monitoring, pari-passu arrangements for new debt and the rule change on employer participation (currently in place as a moratorium until completion of the 2020 valuation).

Clear and collective financial commitments to the Scheme will be crucial in order to maintain the highest covenant rating possible for the 2020 valuation.

Members do not form part of the covenant assessment as they are free to withdraw from the Scheme at any time.

How the Trustee's risk appetite affects the valuation (see Section 4)

While the covenant essentially measures the collective capacity of our sponsoring employers to take risk, we need to understand how much of that capacity we could responsibly rely on.

How your risk appetite affects the valuation (see Section 4)

Despite having our own view, we need to know *your* risk appetite: how much money are you, our sponsoring employers, *willing* to put at risk to fund the Scheme, given other known or potential demands on your finances?

In asking you for feedback on your risk appetite, we are asking how much of the covenant's risk capacity you are committed to deploy to support the Scheme in an adverse scenario. Since risk capacity must support all the risks being run by employers, not all of the risk capacity is available to support the Scheme.

If your risk appetite is not greater than ours, it will provide a limit to the amount of investment risk that can be borne.

Taken together, the strength of the covenant, our risk appetite and your risk appetite ultimately influence the investment strategy, the investment returns we can expect that strategy to deliver in future and, in turn, the regular contributions we need today.

How investment strategy affects the valuation (see Section 5)

In terms of investment strategy, our current thinking would involve an overall investment approach which is consistent with the dual discount rate approach and based on combining different strategies for pensioners and non-pensioners.

In particular, it would involve a **low-risk** strategy for **pensioners** (broadly similar in risk characteristics to the self-sufficiency strategy) combined with a **growth** strategy (i.e., targeting higher expected returns and therefore higher risk) for **active** and **deferred** members before they reach retirement.

Note, however, that this separation is only conceptual, and the investment strategy would be managed in aggregate to take advantage of synergies, pooling and diversification benefits. The aggregate investment strategy would be tested for consistency with risk appetite.

How prudence affects the valuation (see Section 5)

We are required by law to be prudent in our valuations: setting prudent assumptions so that the benefits already promised to our members can be paid in full, now and in the future.

We factored prudence into the discount rate for the 2017 and 2018 valuations: we introduced a margin above our 'best estimate' view – an estimated 50% probability of achieving or bettering our expected investment returns – to give an estimated 67% probability. This reduced the value, in absolute terms, of the investment returns we allowed for in our funding assumptions and the final outcome.

We also built a small amount of prudence into our mortality assumptions, as required under legislation.

No decisions have been taken at this stage, but we are currently minded to take a broadly similar approach to prudence in the Technical Provisions for the 2020 valuation. We may consider different levels of prudence in setting the Technical Provisions and contributions.

2.7 Next steps

After these discussions, a summary of your feedback, and the collective response on behalf of the employers from UUK, will be shared with the Trustee Board for consideration. The Board will meet in mid-May to agree the methodology we will use, based on the professional advice we receive, a review of the feedback we've received (from you, UUK, and the perspectives of the VMDF) and the prevailing financial circumstances.

We then plan to begin a minimum six-week consultation with UUK (as required by the Scheme Rules) by July on the proposed Technical Provisions, the Schedule of Contributions and the Recovery Plan – all of which will be influenced by your feedback on the issues covered in this document.

It bears repeating that, together with market conditions at 31 March 2020, the key inputs set out above – rather than the methodology – will hold the greatest sway over the outcomes. Given similar inputs and assumptions, different methodologies are likely to yield similar results.

3. Covenant

The covenant is the financial ability of our sponsoring employers to support the Scheme now and in the future.

When the Scheme takes risk, it is relying on the covenant for support if, for example, investment returns are lower than we expected. This support is above and beyond the regular contributions employers are required to make under the Schedule of Contributions.

Risk comes in a variety of forms, though, and this is not just a question of investment risk (see Section 4). We need to know how much we can responsibly **rely** on our sponsoring employers – in terms of money – to secure the pension promises they are making today to their employees, our members.

The strength of the covenant reflects the support you and your fellow employers are collectively able and committed to provide to the Scheme, including financial metrics such as the size of your collective balance sheets and future free cash flow, as well as clear evidence of your commitment.

There will be other known or potential demands on your finances, so we need to consider how resilient the covenant is to competing pressures and market conditions.

3.1 The covenant is valuable to the employers

A 'strong' covenant with good visibility benefits all employers because:

- It allows us to take a longer-term view on Scheme funding issues.
- It means employers can retain capital to help run their institutions and invest in future development.
- It also allows us to take more risk in funding the Scheme, which has the potential to reduce the regular contributions we need because it allows us to invest more in growth assets, which should generate higher returns.

The more robust the covenant, the more we can rely on it in our funding assumptions and our investment strategy.

3.2 Measuring the covenant

Risk capacity is difficult to estimate (and estimates are, by their very nature, not definitive), but we have been challenging our thinking on the covenant and testing different ways to assess and evaluate it. There are three aspects of the covenant that are important to assess:

- *Covenant strength rating:* This is an assessment of the ability of the sponsoring employers to collectively support the Scheme.
- *Covenant horizon:* This is the future period of time over which there is 'visibility' of the ongoing strength of the covenant.
- *Covenant risk capacity:* This reflects the amount of capital (broadly defined) available from all employers to support risk-taking in the Scheme.

We now examine these in more detail and present our preliminary conclusions at this stage. We shall be continuing our analysis over the coming months and will feed the results into the formal consultation with UUK on the Technical Provisions, the Schedule of Contributions and the Recovery Plan.

Covenant strength rating

There are four covenant rating bands used by the Pensions Regulator to classify covenant strength: strong, tending-to-strong, tending-to-weak and weak.

In assessing covenant strength with our covenant advisor (PwC), we look at our sponsoring employers, individually and collectively, in terms of: the affordability of future contributions; balance sheet net assets; and what we can learn from corporate valuation techniques. Overall there are seven different covenant metrics that are combined to give a rating to the strength of the covenant.

Based on analysis by PwC, the overall covenant rating for the Scheme is currently **'strong'**, but on **'negative watch'**.

This is due to the risk of increased debt levels and the possibility that employers who provide material covenant support will leave the Scheme in the future, leading to a covenant downgrade to 'tending-to-strong'.

If the measures agreed as part of the 2018 valuation to protect the covenant (the rule change on employers exiting the Scheme, debt monitoring and *pari passu* security on new secured debt) are put in place, then we expect the rating to remain 'strong'.

This rating is the result of four of the seven covenant metrics being rated 'strong' and three being rated 'tending-to-strong', as shown in the covenant dashboard in Figure 3.1.

Figure 3.1: Covenant strength rating dashboard

Covenant Dashboard – 2020 Valuation			
Covenant metric		**Illustrative sub-rating**	**Overall rating**
Group structure	Nature of the Scheme and nature of the higher education sector	S	Strong Strong but on negative watch due to the risks of increased debt levels and strong employers exiting the Scheme.
Balance sheet & financing	Assets and liabilities of the sector	S	
EBITDA (current and forecast)	Strength of EBITDA and coverage of TP deficit	S	
Cash flows (current and forecast)	Cash flow from operations compared to contributions and other commitments	TTS	
Markets	Positioning of employers in the UK and global education market	S	
Affordability	Affordability of higher contributions taking account of flexibility for cost reduction	TTS	
Valuation approach	Cash flow-based valuation compared to Scheme obligations	TTS	

Note: *"S" denotes "strong" and "TTS" denotes "tending-to-strong". Source: data from PwC.*

One of the new approaches to assessing covenant strength that we have looked at in 2020 is the present value of aggregate free cash flow (the seventh metric in Figure 3.1), which:

- Analyses the free cash flow generation of each of 123 university employers and 65 Oxbridge colleges that collectively support around 98% of the liability.
- Projects forward free cash flow generation (adjusted for capital investment) based on market growth assumptions over a period of time.
- Discounts those cash flows back to the present, using a discount rate reflective of the risk in each of the eight higher-education market segments identified by EY Parthenon in previous valuations.

Covenant horizon

As we have mentioned, the covenant horizon reflects how far into the future there is 'visibility' of the ongoing strength of the covenant. In other words, for how long participating employers can *confidently* be relied upon to support the Scheme.

Generally, 20 years is seen as the outer limit of the covenant horizon for a *strong* covenant. However, given the unique nature of the UK Higher Education sector and the 'last-man standing' structure of the Scheme, since 2017 we have been of the view – supported by our advisors – that the covenant horizon extends out to 30 years.

So, we expect that a clear rating of 'strong' should allow us to continue to rely on it over 30 years based on current economic conditions. A lower rating of 'tending to strong' would mean a shorter covenant horizon and we would instead have to consider 20 years to be the maximum.

In practice, this means that a covenant rating downgrade from 'strong' to 'tending-to-strong' would correspond to a reduction in risk *capacity* since there is a shorter time over which contributions could be relied upon.

Covenant risk capacity

In determining the covenant strength rating above, we have factored into our thinking on risk capacity measures such as the present value of the employers' free cash flow and their aggregate net assets.

The free cash flow approach (in which we have also added long-term financial investments and deducted net debt), gives us an alternative estimate of the aggregate capacity of our sponsoring employers to take risk and withstand adverse outcomes.

We believe that an approach based on net assets is less relevant for risk capacity, but analysis of the balance sheets of sponsoring employers is helpful in indicating that the total level of net assets that might be available, if we were to measure the risk capacity of the covenant in this way, would be c. £62bn, based on data from HESA and Oxbridge colleges. (We acknowledge that there may be significant practical challenges in realising the value of these assets should they ever be called.)

The result of this approach (see Appendix B for more details) is broadly in the same range as all other approaches, which give us more confidence in our preliminary conclusions. (Note that the values below are only for illustration.)

- **A 'strong' covenant** which is dependent on the implementation of debt monitoring, *pari-passu* arrangements and a rule change on employers exiting the Scheme **would potentially support around £65bn of risk capacity.**
- **A 'tending-to-strong' covenant would potentially support around £54bn of risk capacity.**

But note that not all of this capacity is available to support the Scheme.

3.3 Employers need to be able and demonstrably committed to support the covenant

In the 2018 valuation, the covenant was assessed as '**strong**' but on negative watch (i.e., at risk of being downgraded to 'tending to strong') pending a package of covenant support measures being agreed.

This rating (shown in Figure 3.1) will be reviewed in due course against progress with the covenant support measures, new data from the Higher Education Statistics Agency (HESA), and the current market outlook, including a more certain political backdrop.

Our current view is that the sector is resilient and will generate cash for a long time. We expect Higher Education to be around indefinitely and our sponsoring employers and their academic staff are most likely to continue to be successful in the UK and internationally. We believe you can afford to provide a strong covenant and we should be able to rely on it for a long time.

However for that to be true, we also need to be sure that employers are **committed** to supporting and prioritising the Scheme.

If implemented in full, the covenant support measures listed below (discussed during the 2018 valuation) would provide a clear signal of your commitment to the Scheme. Based on discussions with PwC, we remain confident that this package would add up to a firm 'strong' covenant rating for the 2020 valuation.

3.4 Covenant support measures

There are a number of different measures that could be put in place to support the covenant and facilitate taking more risk in the funding of the Scheme.

These include:

1. Increased contributions

- Higher contributions have been in place since 1 October 2019 and further increases are scheduled from 1 October 2021 (under the 2018 valuation).
- A shorter Recovery Plan was agreed (10 years from 31 March 2018).

2. Closer monitoring

- Metrics agreed by the Trustee Board have greatly improved transparency and defined triggers for further action are monitored daily and monthly.

3. Measures to address the risk of increasing employer debt

- **Debt monitoring**: Work is underway for a debt monitoring framework to be implemented during 2020.
- ***Pari-passu* security**: As the Scheme is an unsecured creditor (without security or other collateral), there is significant risk to covenant strength if employer assets are pledged to lenders or other third parties (an example of 'known or potential demands on your collective balance sheets and future incomes'). This can be mitigated by similar collateral being committed to cover our liabilities, such that the Scheme is put broadly in the same position as secured creditors for any new debt you take on.

4. Rule change to prevent stronger employers leaving the scheme

- **Moratorium:** A moratorium is in place on any employer leaving the Scheme without our written consent, effective until the 2020 valuation is signed off.
- In order to retain a covenant rating of 'strong', a permanent rule change (which gives confidence over a covenant horizon of at least 30 years) would need to be recommended by the JNC following a UUK-led consultation with employers.

To date, good progress has been made on the first three measures thanks to UUK's engagement – but the fourth remains outstanding. Agreeing to a permanent rule change would be clear evidence of your long-term commitment to the Scheme. If it cannot be agreed and the rule amendment is not formally recommended by the JNC, we understand the covenant would be downgraded to 'tending to strong'.

3.5 Additional contingent support

If the measures identified during the 2018 valuation (debt monitoring, *pari-passu* arrangements and a rule change on employers exiting the Scheme) are implemented in full, we expect the covenant to be rated as 'strong'.

There may be an appetite among employers collectively to pay lower contributions directly into the Scheme in the short run than we would consider appropriately prudent for a 'strong' covenant. In other words, employers may wish to be more directly exposed to the expected upside of higher investment returns.

For this to happen, we would need a degree of additional contingent support that clearly demonstrates your commitment to cover the potential downsides (such as investment returns being lower than we expected).

We believe this can be achieved in a way which avoids diverting employer assets into the Scheme unnecessarily if our investment assumptions are borne out or in more favourable scenarios.

There are examples of other pension schemes which have diverted some employer funds into contingent support vehicles, such as an escrow account, reservoir trust, or other structure, in order to resolve different risk appetites between trustees and employers by linking the sums that are payable to the scheme more directly to the scheme's actual experience. In this way, if reality is more in line with the employer's expectations then the contributions payable to the scheme under the contingent funding structure will be more in line with the employer's preferred assumption, and vice versa.

The key features of this arrangement are as follows:

- If realised investment returns are sufficiently high, then additional contributions (together with the returns they generate) may be returned to employers.
- It provides visibility of, and confidence in, additional contributions should they be needed.
- It would be drawn into the fund only in response to the funding level falling below an agreed level.

We would therefore be willing to explore with you whether this type of arrangement would be of interest, before time is spent examining the merits of a particular vehicle in more detail. We would welcome feedback to help understand this. For more information of how one example of this one option might operate in relation to USS, see Appendix C for an illustration.

There will no doubt be other considerations that would also need to be worked through carefully if a solution is to be found that meets both the Scheme's and our stakeholders' needs.

3.6 Conclusions

We have established two covenant scenarios, 'strong' and 'tending-to-strong', with the following indicative risk capacities:

- **A 'strong' covenant** which is dependent on the implementation of debt monitoring, *pari-passu* arrangements and a rule change on employers exiting the Scheme would potentially **support around £65bn of risk capacity.**
- **A 'tending-to-strong' covenant** would potentially **support around £54bn of risk capacity.**

We look to understand how much of this risk capacity you wish to make available to the Scheme.

A clear and demonstrable commitment to provide access to the covenant **and** material, pre-agreed, enforceable contingent arrangements may give us greater flexibility on the level of contribution required to be paid into the Scheme.

4. Risk appetite

In the context of the actuarial valuation, risk appetite is the willingness to take risk in the way the pensions promised to our members are funded, now and in the future.

This willingness to take risk must be consistent with the ability to cope with the potential downsides: the risk not being rewarded and investment returns being lower than expected.

There are a number of factors that drive risk in funding the Scheme, including:

- **Economics:** Investment returns, inflation, real interest rates
- **Demographics:** Life expectancy (mortality), dependants, retirement trends
- **Regulations:** Government policies, regulations
- **Covenant:** The ability and willingness of employers to support the Scheme

Our **primary** objective and statutory duty as Trustee is to ensure that the benefits our members have already built up can be paid as and when they fall due.

There needs to be a very high degree of certainty, at all times, that we will have enough money to pay the benefits that have been promised. So, we need to monitor the Scheme over the short term to check that it is on course for the long term.

This involves:

- Identifying risk metrics and thresholds that signal a potential problem.
- Monitoring these risk metrics against thresholds.
- Understanding how we would respond if the thresholds are breached and being prepared to take action.

At the same time, we want to protect the sustainability of the Scheme; for it to remain affordable and open; for the benefits to remain valuable; and for contributions to be relatively stable. But this **secondary** objective can only be considered to the extent it doesn't conflict with our primary duty.

4.1 Balancing our objectives

If our only objective was to fulfil our statutory duty, we would look to take a very low-risk approach to funding the Scheme.

Under a 'self-sufficiency' strategy, the probability of requiring any additional contributions from employers if appropriately funded is c. 5%. That is at face value riskier than insurance companies and banks would consider to be 'low risk', but at this level we would be confident that the pensions already promised to our members could be paid.

This would, however, be a very expensive approach and would make the sustainability of the Scheme very difficult. Sustainability is important to us, to our members and to our sponsoring employers.

So, to strike the right balance, we need to consider how much more risk we *can* and *should* take, over and above a 'self-sufficiency' approach:

- How much more risk can we justify taking, in the short-term and the long-term, without putting the benefits promised to our members at risk?
- How much of their net assets and future income are our sponsoring employers willing to commit, over other financial priorities, to paying USS pensions if investment returns are lower than expected and the funding plan does not pan out as expected in the budgeting process?

These are questions we have looked to answer in each of the past three valuations.

While they don't guarantee that our secondary objective can be met, they provide the room for it to be considered.

Given our legal duty, being able to evidence that we could if needed move to fund the Scheme on a low-risk 'self-sufficiency' basis is a very important consideration. It would only become our target in a sufficiently adverse scenario, but that is precisely the point: taking more risk can help to keep the Scheme affordable and open – but we must be sure that the promises being made can always be kept even if the risks being taken are not rewarded.

4.2 Short-term risk v long-term investor

There is a widespread view that investment risk naturally diversifies over time, so that longer investment horizons imply more risk can be safely taken.

This is known as 'time diversification' and suggests that all will come good if we wait long enough.

Over recent months, we have looked at this question in a working group (the Stochastic Modelling Working Group) formed of JNC members from UCU and UUK, along with USS representatives.

The modelling produced as a result of this engagement shows that higher risk investments tend to perform better over the long term.

However, it is also important to consider that as the probability of loss decreases over time, the potential size of any loss that occurs increases. These effects counteract each other to some extent.

The results will also depend on the details of the model, which become less reliable over time. It is also very difficult for these models to take account of the error in the estimated expected investment return (which can have a large impact on the results). These are examples of 'model risk'.

While the VMDF continues to explore these issues and alternative approaches, we would caution that we could not continue with a high-risk investment strategy if the deficit was approaching the limits of the covenant's capacity, even if it was *expected* to improve over the long run. This would not be compliant with legislation.

Ultimately, managing short-term risk against a long-term objective requires careful consideration and balanced, collective judgements.

4.3 Prudence

A legal requirement, prudence in a valuation is important for security, stability and affordability:

Security: Prudence involves ensuring that the Scheme holds more assets than required on a 'best estimate' (or expected) basis, thereby improving the security of members' accrued benefits and particularly those in payment.

Stability: It provides a buffer against risk materialising and, as such, a degree of stability. As market conditions change this buffer varies and, providing this variation is not too great, means that contribution rates do not need to be reset on a more regular basis.

Affordability: The more prudent we are, the less affordable the Scheme becomes, so too much prudence can affect the overall sustainability of the Scheme.

Over the long term, **prudence should not be considered as a cost** because if best estimate assumptions are borne out, it could potentially be returned in future to employers and members through lower contributions and/or improved benefits. See Appendix B for an example of how this could be realised in practice in the case of employers.

4.4 Our risk appetite

Our risk appetite, as Trustee, is based on our view of the employers' covenant and how much of that can and should be deployed to support the Scheme.

Ultimately our risk appetite will be lower than our assessment of the employers' risk capacity (see Section 3).

In forming a view of our risk appetite, we recognise that we cannot and should not rely on your full risk capacity, as there will be other calls on this capacity (e.g., for debt funding and for investment in your business).

So, our risk appetite will only be a proportion of the total risk capacity figures illustrated in the previous section of c. £65bn and c. £54bn.

4.5 Impact of risk-taking on members

We would expect the following statements to hold true in generic terms for our members – and this is reflected in the 'dual discount rate' approach being considered:

Benefits already built up: No members should have any significant risk appetite in relation to pension benefits already built up, and particularly those in payment.

There are downsides to taking risk in relation to funding these benefits as they could be cut (prior to retirement) if taking too much risk leads to a very extreme (but very low probability) adverse outcome, i.e., the Scheme enters the PPF. Pensioners should have the lowest appetite of all for taking risk.

Active members and their future benefits: Members currently paying contributions into the Scheme are subject to risk with respect to funding future benefits.

In contrast to benefits already built up, there are potential upsides (benefits improving and/or member contributions reducing) to consider against the potential downsides (benefits reducing and/or contributions increasing).

However, any upside is likely to emerge only slowly over time, whereas a downside could emerge much more quickly if markets were to fall or underperform significantly.

How do we take account of members' risk appetite?

Members are free to leave the Scheme at any time. In this context, we cannot make any meaningful allowance for them supporting the Scheme in the event of an extreme adverse outcome. So, their risk appetite can have very little impact on our assessment of risk appetite overall.

4.6 Please provide feedback on your risk appetite as an employer

The collective risk appetite of all our sponsoring employers is a factor that we take into account in the valuation of the Scheme. If this is less than our risk appetite, it will be used to limit the amount of risk allowed for in the valuation. If it is greater, then *our* risk appetite will be the limiting factor.

Your risk appetite requires a clear and unambiguous statement – backed, where possible, by concrete actions – about your commitment, as sponsoring employers, to support the Scheme and to make good any shortfall if investment returns are lower than expected.

It's a question we've asked in the past and something we are now asking you to consider again for the 2020 valuation: How much of your net assets and future income are you willing to commit, over and above other financial priorities, to funding USS pensions if investment returns are lower than we expected?

The following information and discussion points may help you in calibrating and framing your answer.

Employers' risk capacity and risk appetite

In asking you for feedback on your risk appetite, we are asking how much of the covenant's risk capacity you are prepared to deploy to support the Scheme in an adverse scenario. Since **risk capacity must support *all* the risks being run by employers**, not all of the risk capacity is available to support the Scheme. It must also support the risks associated with debt, business investment, competition, funding, changes to higher education and other environmental factors.

In the 'monitoring and actions framework' for the 2018 valuation, we used as a covenant risk threshold the present value of an additional 10% of payroll paid over 30 years (the covenant horizon).

This was an estimate of the level of contributions that could be committed to the Scheme to fund a large deficit, if it were to emerge, while still leaving employers with capacity to provide an ongoing (but possibly different) pension arrangement.

Our preliminary analysis has involved approaching risk capacity and risk appetite in different ways for the purposes of the 2020 valuation, as discussed in Section 3. Some of these are summarised in Table 4.1.

Table 4.1: *Different perspectives on the value of the sector's risk capacity*

Covenant metrics for determining risk capacity and risk appetite	Approximate value
Sector's net assets	£62bn
7% of salary over 20 years	£15bn
10% of salary over 30 years	£35bn
NPV of free cashflow* – covenant "tending to strong"	£54bn
NPV of free cashflow* – covenant "strong"	£65bn

* This is calculated using the free cash flow valuation approach described in Section 3 and more information is given in Appendix B.

Assumption of employers' risk capacity for this discussion document

For the purposes of this discussion document and illustrating the methodology, **we assume (for illustration only) that the employers' risk appetite is c. £35bn for a 'strong' covenant.** Note that this assumes that debt monitoring, *pari-passu* arrangements for new debt and a rule change on employers exiting the Scheme are all in place.

In reality, your risk appetite may be very different from this figure (and we are requesting feedback from you on this), but we do need to make an assumption to illustrate the methodology and we feel this could be justified as follows.

First, it corresponds to the present value of 10% of payroll annually over the covenant horizon of 30 years. Second, if we assume that c. £30bn (about half of the risk capacity) is needed to support other risks facing the employers, then the amount left to support the Scheme is c. £35bn.

What does a risk appetite of £35bn mean for employers? It means that you are telling us that, in a sufficiently adverse scenario, you would be prepared to pay up to 10% of payroll annually over c. 30 years to repair the deficit. These payments would be in addition to whatever you required to fund a reasonable level of ongoing pension provision for your employees in that situation.

If the covenant were downgraded to 'tending-to-strong' then we assume (for illustration) that the employers' risk appetite falls to c. £25bn.

What does a risk appetite of c. £25bn mean for employers? It means that you are telling us that, in a sufficiently adverse scenario, you would be prepared to pay up to 10% of payroll annually over c. 20 years to repair the deficit. These payments would be in addition to whatever you required to fund a reasonable level of ongoing pension provision for your employees in that situation.

We recognise that this risk appetite may be different from that you would wish to use in funding the Scheme in practice and that is why, as part of this discussion, we are asking you: how much risk are you prepared to support in funding the Scheme?

Employers' *long-term* target risk appetite in 20 years

In 2017 and 2018, your collective risk *appetite* (defined relative to the cost of moving to a self-sufficiency strategy) was summarised as £10bn in real terms in 20 years' time.

This was derived in 2017 by considering the present value of an additional 7% of payroll paid over 20 years (from year 20 onwards) rolling forward the value on the valuation date at CPI inflation, that value was £13bn.

This was then given a 'haircut' from £13bn to £10bn to reflect the sector's collective discomfort with the overall level of risk.

At the time, we invited you to consider rolling this amount forward in line with our assumption for the growth of the sector (which was CPI + 2%), but this was rejected as it involved too much incremental risk.

This *long-term target* risk appetite in 20 years used in previous valuations was considerably lower than the illustration we have used for *current* risk appetite.

Current measurement of risk

To help put risk appetite in context, it is helpful to understand the recent levels of risk in the Scheme.

At 31 December 2019 the self-sufficiency deficit was £24.8bn and the risk buffer (the one-in-20 worst case increase, or one-year VaR) was £19.0bn, so that the covenant support requirement amounted to £43.8bn. These figures will fluctuate over time. (In calculating these figures allowance has been made for the impact of the government's proposed RPI reform, which is discussed in more detail in Section 6 and Appendix E.)

When would we "require" 10% of salary over 30 years?

It is not our intention ever to unilaterally call on the "10% of salaries over 30 years"; however, sufficiently adverse circumstances might lead us to initiate a discussion with you in which this would be a potential option.

This is primarily a way of helping you to express your risk appetite in terms of how far away from self-sufficiency you wish the Scheme to be positioned, and how much of your risk capacity you wish to allocate to support the Scheme.

Recall self-sufficiency corresponds to the Scheme's 'safe harbour', a low-risk investment strategy with a high probability of providing all the promised benefits without requiring any additional contributions.

We could have expressed risk appetite as a single aggregate figure for all employers, for example £35bn, but expressing it in these terms does not allow you, as a single participating employer, to directly engage with what that means to you.

By expressing risk appetite instead as a percentage of salary over a number of years, we believe the amount of risk being taken becomes meaningful and provides a way for you to articulate the amount of risk you are willing to take in funding the Scheme.

Whilst the Scheme remains open, we would only expect to move to a self-sufficiency funding approach and call on these contributions if we were out of other, less costly options to keep members' benefits secure and certainly only after having fully consulted with you.

We will endeavour to manage the risk in the Scheme within the risk appetite agreed with you as a result of feedback from this document.

Should the agreed risk appetite be exceeded on a sustained basis, we will inform you of the steps we are taking to bring the risk back within appetite.

Should these steps require substantial changes to the investment and/or funding strategies, this will likely require an additional actuarial valuation and an extensive discussion with you and other stakeholders on the best way forward.

5. Investment strategy

In contrast to the 2017 and 2018 valuations, we are proposing that the investment strategy for the 2020 valuation will not be determined directly from the valuation calculations. This allows maximum flexibility in the choice of investment strategy and avoids the issues associated with the way 'Test 1' was applied.

Instead, it will be based on the strength of the covenant, employers' risk appetite, our risk appetite, and the expected development of the Scheme's membership over time.

5.1 Investment strategy and dual discount rates

We are proposing an overall investment approach based on combining different strategies for pensioners and non-pensioners. These two components reflect (in part) our assumptions on the respective risk appetites of pensioners and non-pensioners (see Section 4). This implies different discount rates for both – a 'dual discount rate' approach:

- A **low-risk** strategy for **pensioners**
- A **growth** strategy for **active** and **deferred** members before they reach retirement (i.e., higher risk and higher expected return)

Pensions in payment would be supported by a low-risk investment strategy, with similar (but not identical) risk characteristics to a 'self-sufficiency'-like strategy. By contrast, pensions earned by active and deferred members would be supported, before they come into payment, by a growth investment strategy.

The underlying investment strategy for pensioners would involve large holdings of public and private credit, as well as Government bonds (e.g., 'gilts') and small holdings of growth assets. The underlying investment strategy for non-pensioners (active and deferred members) would involve a higher allocation to growth assets (e.g., equities and property).

Note that the overall investment strategy would not just be a simple combination of these two strategies. It would be a combination that is adjusted to benefit from pooling effects and synergies so that, in aggregate, it is an appropriate strategy for funding the benefits. The overall make-up of the portfolio would also reflect overall considerations of risk appetite.

Pensioners currently account for around 45% of our liabilities (on a Technical Provisions basis) and active and deferred members for around 55%. Based on the 'dual discount rate' approach, this implies an initial investment strategy that is 55% growth assets and 45% lower-risk assets. This is a lower holding of growth assets than the current strategy (65% at 31 December 2019).

As more members retire, this balance will shift. We expect it to even out over the next 20 years, which implies an investment strategy that is 50% growth assets in 20 years' time. This is higher than the current strategy which, under the 2018 methodology, would lead to a 20% allocation to growth assets in 20 years. The net effect is an investment strategy that, relative to the 2018 approach, takes less risk in the short term and more risk in the long term.

5.3 Managing risk

The amount of risk that we can take in the investment strategy is dependent on the strength of the employers' covenant, our risk appetite and, in particular, your risk appetite as employers. The greater the covenant support, the greater the amount of investment risk we can take, which results in lower Technical Provisions and lower regular contributions.

Our primary measure of risk in relation to funding is the cost of moving to a 'self-sufficiency' investment strategy (the amount of assets required to fund a low-risk strategy which, 95% of the time, would be expected to cover all benefits built up without additional contributions). **See Section 4 for more on why this is an important measure**.

The 2018 methodology targeted a level of Technical Provisions that, under 'Test 1', was a specific value short of self-sufficiency in 20 years' time. This target drove the investment strategy, which in turn drove the Technical Provisions discount rate.

Under the proposed methodology, we consider a different self-sufficiency-related measure to check whether the proposed investment strategy is within our risk appetite.

Given our primary objective and a key legal duty is to ensure that all benefits built up can be paid as they fall due, both now and in the future, understanding and addressing the 'self-sufficiency' deficit remains important.

But we also recognise that while we have adequate covenant support it is not necessary to target self-sufficiency. Rather, we need to plan for ensuring we have the ability to change strategy and target self-sufficiency in the event that a sufficiently adverse event were to occur. As such, we propose to use a risk measure that combines the cost of 'self-sufficiency' with a risk buffer corresponding to a measure of the potential downside risk. The downside risk could be measured, for example, using a Value at Risk (VaR) approach (e.g., a one-in-20 worst case increase in the self-sufficiency deficit within a one year period) or a similarly severe stress test.

Either way, the cost of 'self-sufficiency' plus the downside risk value must fit within the capacity of the covenant. More critically, it must be within our risk appetite and within the collective risk appetite of our sponsoring employers.

The approach constrains the investment strategy used in funding the promised benefits, which in turn constrains the acceptable overall discount rate and Technical Provisions. The use of this approach is evident in the indicative results presented in Section 7.

Note that the above approach to managing the risk within the investment strategy would also allow for a different investment strategy which need not be so closely aligned with a dual discount rate approach. For more detail on our approach to managing the risk in the Scheme, see Appendix D.

6. Assumptions

To determine if the assets we hold are adequate to pay promised benefits *and* if the required contributions are adequate to cover future benefits, we need to make some assumptions.

These relate to our members, their employers, the Higher Education sector, global financial markets and the global economy. They will inform how we expect the Scheme to develop and the future investment returns that we expect to achieve from the investments we hold.

The assumptions that we use are based on analyses of past experience and, crucially, our expectations of the future, adjusted for prudence.

For the indicative outputs of the methodology presented in this document (see Section 7) we have used membership data at 31 March 2019, rolled forward to 31 December 2019.

All demographic assumptions are the same as we used for the 2018 valuation and can be found here.

The financial assumptions have been updated to reflect the conditions and future outlook at 31 December 2019.

As part of the 2020 valuation, we are reviewing all of the assumptions and there will be a formal consultation on them with UUK through the Technical Provisions consultation in the summer (as set out in the timeline in Section 9).

6.1 Financial assumptions

The two key financial assumptions are the expected investment returns and the development of inflation, specifically CPI and RPI.

Expected investment returns

Our forecasts of investment returns for our investment strategy will be derived from our established Fundamental Building Blocks (FBB) model.

However, we propose that the way they are used in the 2020 valuation would change, to reflect our proposed 'budgeting exercise' approach. We are considering using a 30-year average expected return, which for simplicity will be expressed relative to gilts. In the methodology adopted for the last two valuations we used two distinct periods to develop forecasts for expected returns and the evolution of gilt yields: a 10-year transition period to equilibrium followed by a 20-year equilibrium period.

CPI inflation

All the benefits provided by the Scheme, with a very few exceptions, are linked to CPI. We therefore need to take a view as to how CPI will develop over time.

In past valuations we have used 'market implied RPI' less a fixed margin (130 basis points) to estimate CPI, where 'market implied RPI' is the difference between the yield on nominal and index-linked Government bonds.

Since the 2018 valuation, the Government has confirmed it is reviewing the RPI inflation measure with potential changes being implemented from as early as 2025 but more likely after 2030.

The potential changes stemming from this review are partially factored into the index-linked gilts yield as at 31 December 2019 and, as such, distort the market implied RPI.

The level of distortion is a matter of debate and we are still working to model the potential impact.

The Government has announced that its consultation document inviting feedback on RPI reform will be published on 11 March. It is expected that it will provide greater clarity about how and when the proposed reforms to RPI will be implemented.

In producing the indicative results, we have allowed for RPI reform on the basis that the current methodology understates expected CPI inflation by 20 basis points a year, as a result of the Government's proposed reform. This figure is an estimate.

We expect to allow for developments in this area when presenting the results calculated as at 31 March 2020.

6.2 Dual discount rates

From our investment strategy and expected investment returns, once prudence is considered, we can determine a set of dual discount rates for the valuation. In this document we provide indicative methodology outputs using the following dual discount rates for illustration purposes only:

- Gilts + 0.75% for pensioners.
- Gilts + 1.75% to gilts + 2.5% for active and deferred members pre-retirement (depending on the strength of the covenant, our risk appetite, and your risk appetite as sponsoring employers).

We have expressed the discount rates relative to gilts purely for ease of comparison. They were not calculated from a so-called 'gilts+' approach, but based on our FBB model. These returns are re-evaluated monthly and, for any given portfolio, the spread over gilts is likely to change over time.

We will be conducting further work on dual discount rates once we understand the market conditions prevailing on the valuation date, 31 March 2020.

6.3 Feedback

We are not seeking feedback on assumptions at this point. The assumptions in this document are for illustration only.

We will begin the formal consultation with UUK on the assumptions for the Technical Provisions, Schedule of Contributions and Recovery Plan by July, which will reflect the position as at 31 March 2020.

7. Indicative methodology outputs

This section sets out indicative outputs to illustrate the proposed methodology for the 2020 valuation, based on analysis at **31 December 2019** and assuming that:

- The proposed methodology we've outlined in this document is applied.
- Market conditions are those prevailing at 31 December 2019.
- Member data is updated to 31 December 2019.
- Our demographic assumptions are the same as for the 2018 valuation
- The covenant is rated either 'strong' or 'tending-to-strong' with no additional support.
- A risk appetite of £35bn for 'strong' and £25bn for 'tending-to-strong' is acceptable to both of us.

Note that we present two cases for the covenant based on the proposed methodology and these assumptions:

Covenant case one – the covenant remains 'strong' (i.e. the permanent rule change, debt monitoring and *pari-passu* arrangements are put in place).

Covenant case two – the covenant is downgraded to 'tending to strong' (i.e., assumes the rule change cannot be agreed but the debt monitoring and *pari-passu* arrangements are put in place).

You may prefer to take a different level of risk to that in either of these cases. This is among the issues we are seeking your views on.

We also present results using the 2018 methodology (i) as implemented in the 2018 valuation updated to 31 December 2019 and (ii) without any further derisking of the investment strategy or the constraint of Test 1.

7.1 Investment strategy

We have looked at two possible investment strategies in line with the cases set out above as part of the indicative calculations carried out for illustration purposes in this document.

Covenant case one

Based on the 'dual discount rate' approach (see Section 5) with a covenant rated "strong", which would allow us to take a higher level of risk, this implies an initial investment strategy that is 55% growth assets. This is lower than the current strategy, which is 65% growth assets.

Over time, as more members retire, this balance will shift. Allowing for new entrants and new accrual, we would expect it to even out over the next 20 years, which implies an investment strategy that is 50% growth assets in 20 years' time. This is higher than in the current strategy under the 2018 valuation methodology (which could see as little as 20% in growth assets in 20 years' time).

The net effect is an investment strategy that takes less risk in the short term and more risk in the long term, relative to the 2018 strategy.

Covenant case two

For a "tending to strong" covenant, a lower proportion of growth assets would be held in respect of members before retirement, reflecting the lower investment risk that can be supported by the covenant.

This would give an initial investment strategy that is around 40% growth assets initially, falling to around 35% growth assets in 20 years' time. This is still higher than in the current strategy in 20 years' time.

This highlights an important difference between the 2018 methodology and the approach we have been discussing. The new methodology is driven by a level of investment risk that is broadly stable over time and varies depending upon your risk appetite and capacity. The old methodology left the current level of risk unchanged but targeted a much lower level of risk in the future, driven by Test 1.

7.2 Indicative output as at 31 December

Indicative outputs for the funding position and future service contribution requirements, together with our primary risk metrics, are given in Tables 7.1 and 7.2.

- Table 7.1 provides figures on basis of the *2018 methodology* updated to 31 Dec 2019.
- Table 7.2 provides figures allowing for the proposed *2020 methodology*.

The tables present key metrics both at the valuation date and based on prudent assumptions at 2040. We have also considered results at other dates but have not included them as they do not give any significant additional information.

RPI reform

In both tables we have made allowance for the impact of the Government's proposed reform of RPI inflation on index-linked gilt yields. While this is not a methodology issue *per se*, it will affect future Technical Provisions and contribution rates, and so is an important factor to be aware of in evaluating your risk appetite.

With the Government's formal consultation on RPI reform not commencing until 11 March, the range of possible outcomes is wide. However, we have already seen a change in the level of breakeven RPI that is implied in gilt yields. This has a direct impact on our assumptions, in particular the future level of CPI inflation, which is important as future benefit payments are linked to CPI.

Covenant support requirement

The 'risk impact' shown in the tables is the one-in-20 worst case increase in the self-sufficiency deficit[1] in 20 years' time (see Section 4). We use a one-year risk impact because one year is a period over which the Trustee expects to be able to initiate a plan to respond to adverse events if needed.

[1] This is the one-year Value at Risk (or VaR) for the self-sufficiency deficit at the 95% confidence level.

The covenant support requirement is the sum of the 'self-sufficiency' deficit and the risk impact – the need for the employers' risk appetite to cover this amount has already been discussed. Note that all the results shown for 2040 are expressed in real terms. At 31 December 2019 the self-sufficiency deficit was **£24.8bn** and the risk impact given the current investment position was **£19.0bn**, resulting in a total covenant support requirement of **£43.8bn**.

So, the current covenant support requirement of £43.8bn exceeds the assumed current risk appetite of £35bn for a 'strong' covenant. However, the buffer between the self-sufficiency deficit and the assumed risk appetite is still potentially adequate, as discussed in Sections 3 and 4. But it strongly suggests that we will need to take steps to address the level of risk within the Scheme in the short term.

Indicative outputs using the 2018 methodology

The figures in Table 7.1 reflect the 2018 methodology updated to 31 December 2019. They show that, before allowing for the impact of RPI reform on yields on index-linked gilts (row two of the table), the TP deficit at 31 December 2019 has fallen by 28% since 31 March 2018, as asset returns have broadly offset the impact of the fall in real interest rates and lower expected investment returns. However, these movements have led to an increase in the Future Service Cost (FSC – the cost of future pension benefits) of 2% of payroll.

*Table 7.1: **2018 methodology:** Indicative results for Technical Provisions and future service contribution requirements as at 31 December 2019 using the methodology for the 2018 valuation. Figures in 2040 for the self-sufficiency deficit are based on the projected difference between the self-sufficiency liability and the expected level of assets.*

31 Dec 2019 **2018 Methodology**	TP Liability (£bn)	TP Deficit (£bn)	FSC (Future Service Cost)[1]	TP Discount Rate[3] (Gilts+)	FSC Discount Rate[3] (Gilts+)	SS Deficit in 2040 (£bn)	Risk Impact in 2040 (£bn)	Covenant support requirement 2040 (£bn)
2018 valuation result in 2018	*67.3*	*3.6*	*28.7%*	*1.33%*	*1.48%*	*10*	*c. 6*	*c. 16*
2018 methodology (no RPI allowance)	75.5	2.6	30.6%	1.33%	1.48%	11	6	17
2018 methodology (with RPI allowance) [2]	**78.3**	**5.4**	**32.5%**	**1.33%**	**1.48%**	**11**	**6**	**17**
2018 methodology no derisking (with RPI allowance) [2]	66.1	(6.8)	24.2%	2.23%	2.57%	31	17	48

1. Future service cost (FSC) is given as a percentage of payroll.
2. TP liability and FSC adjusted by assuming a 'gilts+' basis.
3. Discount rate expressed as a single rate equivalent for ease of comparison.

Notes: *We have expressed the discount rates relative to gilts purely for ease of comparison. They were not calculated from a so-called 'gilts+' approach, but based on our FBB model. The final column assumes gilt yields revert in line with our expectations and that the Scheme is fully funded on a TP basis. Should gilt yields remain at levels similar to those at 31 December 2019, covenant support requirements at 2040 would be considerably higher.*

Allowing for the impact of RPI reform (row three of the table) increases the TP Liability and TP deficit by some £3bn and adds a further 2% to the FSC, increasing it to 32.5%. This *third row in the table is the key case for the 2018 methodology* against which the results for the new methodology should be compared.

The final columns in row three highlight the change in risk profile over time under the 2018 methodology. The reduction in growth assets due to the derisking incorporated in the 2018 investment strategy brings the projected self-sufficiency deficit down from £24.8bn at 31 December 2019 to £11bn in 20 years. Furthermore, the risk impact falls from £19.0bn today to £6bn over the same period.

As a result, the total covenant support requirement falls by some c. 65%, reflecting the amount of derisking in the 2018 investment strategy.

The final row of the table, *'no derisking'*, considers the case of the 2018 methodology with the investment strategy unchanged through time, with 65% of the portfolio continuing to be invested in growth assets.

This gives a higher expected return (and hence a higher discount rate for a similar level of prudence) and leads to lower TP and FSC. However, in this case the covenant support requirement increases over time, from £43.8bn at 31 December 2019 to £48bn in 20 years' time.

This is likely to be far outside our risk appetite, and we assume it to be outside of your risk appetite.

Moreover, if our expectation of future gilt yields rising to equilibrium levels were *not* to materialise, then the self-sufficiency deficit in 20 years' time under this 'no derisking' case would increase from £31bn to £54bn. This is likely to be even further outside of our risk appetite.

Indicative outputs using the proposed methodology

The indicative results as at 31 December 2019 for the proposed dual discount rate methodology are set out in Table 7.2. As mentioned earlier in this document, we will be conducting further work on the dual discount rate methodology.

*Table 7.2: **Proposed methodology:** Indicative output for Technical Provisions and future service contribution requirements as at 31 December 2019 using the proposed methodology for the 2020 valuation. Figures in 2040 for the self-sufficiency deficit are based on the projected difference between the self-sufficiency liability and the expected level of assets.*

31 Dec 2019 **Proposed Methodology**	TP Liability (£bn)	TP Deficit (£bn)	FSC (Future Service Cost)[1]	TP Discount Rate[2] (Gilts+)	FSC Discount Rate[2] (Gilts+)	SS Deficit in 2040 (£bn)	Risk Impact in 2040 (£bn)	Covenant support requirement 2040 (£bn)
2018 methodology (with RPI allowance)	78.3	5.4	32.5%	1.33%	1.48%	11	6	17
"Strong" covenant	**78.0**	**5.1**	**30.0%**	**1.35%**	**1.76%**	**17**	**15**	**32**
"Tending-to-strong" covenant	**81.9**	**9.0**	**34.0%**	**1.10%**	**1.33%**	**14**	**11**	**25**

1. Future service cost (FSC) is given as a percentage of payroll.

2. Discount rate expressed as a single rate equivalent for ease of comparison.

***Notes:** We have expressed the discount rates relative to gilts purely for ease of comparison. They were not calculated from a so-called 'gilts+' approach, but based on our FBB model. The final column assumes gilt yields revert in line with our expectations and that the Scheme is fully funded on a TP basis. Should gilt yields remain at levels similar to those at 31 December 2019, covenant support requirements at 2040 would be considerably higher.*

We have not made any decision on the discount rate for the 2020 valuation but in order to illustrate the dual discount rate approach, we have used a discount rate of gilts + 0.75% for post-retirement members. For pre-retirement (active and deferred members) the discount rate is:

- For a 'strong' covenant: The pre-retirement discount rate is gilts + 2.5%.
- For a 'tending-to-strong' covenant: The pre-retirement discount rate is gilts + 1.75%.

These reflect the different proportions of growth asset held in the investment portfolios as discussed in Section 7.1.

This reflects the fact that while the profile of risk taking may have changed for accrued benefits, the overall level of risk has not. This can be seen by comparing the TP discount rates for the 2018 methodology (1.33%) with the 'strong' covenant case (1.35%), which only vary by 2 basis points.

However, the FSC is lower by 2.5% under the new methodology reflecting the relatively higher weighting to growth assets for younger members. This means that the expected cost of providing future pensions is lower under this methodology.

If you were to have a risk appetite that was lower, say in line with the final row in Table 7.2, or if the covenant were to be downgraded to 'tending-to-strong', then both the TP liability and FSC would rise.

The proposed methodology suggests that, in the 'strong' covenant case, the initial allocation to growth assets should fall from the current level of c. 65% to c. 55%. If implemented, this change would reduce the current covenant support requirement by £2bn to £42bn, but it would likely be outside of risk appetite, and as such, consideration would need to be given to the steps needed to bring the position back within risk appetite.

The proposed methodology would give a more stable allocation to growth assets over time and hence a more stable risk exposure, with the covenant support requirement in 20 years' time rising from £17bn under the 2018 methodology to £32bn under the proposed methodology. This is within the illustrated risk appetite of £35bn for a 'strong' covenant and we are keen to understand your views on this issue.

Should gilt yields *not* rise to equilibrium levels as expected but stay close to current levels, then the self-sufficiency deficit in 20 years will increase from £17bn to £24bn in the 'strong' case and from £14bn to £19bn in the 'tending-to-strong' case. These deficits and their associated risk impact numbers result in covenant support requirement above the illustrated risk appetites for 'strong' and 'tending-to-strong' covenants.

The projections in Tables 7.1 and 7.2 show the anticipated position of the Scheme at the 20-year point, if the expected level of yield reversion takes place. In particular, they reflect the Scheme being fully funded on a Technical Provisions basis by that time, which would mean making adjustments to the contributions payable over the period based on the realised experience.

Note that we have not considered the aggregate level of contributions payable at this stage (and, in particular, the level of any deficit contributions required), with these being the subject of a consultation in the summer.

Yield reversion would, all else being equal, reduce the cost of benefits and therefore the contribution rate could potentially reduce over time. If yield reversion does not take place then, all else being equal, more contributions would be required over the period.

Impact of risk appetite on the indicative outputs

The tables above demonstrate there is a wide range of potential outputs from the proposed 2020 methodology which are dependent on our view of the strength of the covenant and your risk appetite.

The two cases are intended to give you an insight into the trade-offs that arise from the level of risk appetite you indicate you are willing to take.

They show the relationship between the level of covenant support, the level of investment risk, and contributions. While we must emphasise that these figures are indicative, we hope that the relativities between them are helpful.

Our view on how much of the covenant risk capacity could reasonably be relied on in setting funding assumptions could be strongly influenced by measures you could put in place to provide greater visibility of and access to your covenant support if and when it was required.

The kind of additional covenant support that would be required is discussed in Section 3.5 and Appendix C.

A clear and demonstrable commitment to provide material support of this nature will potentially allow us to consider proposals involving greater risk and so might allow lower immediate contributions into the Scheme.

Depending upon your risk appetite, the level of the covenant support requirement could be managed in a number of other ways, including the following:

- Adopting a higher level of prudence in the Technical Provisions. This results in a higher level of Technical Provisions and hence a lower self-sufficiency deficit in 2040. It would allow greater investment risk to be taken which, if rewarded, will give rise to a lower long-term contribution requirement.
- Reducing the proportion of return-seeking 'growth' assets and increasing low-risk assets. This reduces the risk impact but also reduces the expected return whilst potentially enabling the Technical Provision to be maintained. In the long-term contributions would be higher than with more growth assets.
- In Section 2 we referred to some of the trade-offs that must be reckoned with in arriving at a funding solution, and in particular noted the high cost of guaranteed benefits. Subject to compliance with legislation, our duties and the Scheme rules, it could be explored whether the level, or shape, of guaranteed benefits could be re-arranged. Depending on the approach, such changes could result in lower self-sufficiency liabilities and options on the level of funding for Technical Provisions. The potential benefits (upside) and risks (downside) to member outcomes would need to be examined carefully. We remain very willing to support stakeholders in the exploration of such options, which remain the sole prerogative of the stakeholders, but any detailed discussion on these is outside the scope of this document.

7.3 Additional option requested by the VMDF

The VMDF has been exploring an option involving a higher-return (and higher-risk) investment strategy than the illustrations presented in Table 7.2 but with a contribution rate set a higher level than required by the FSC for this strategy in Table 7.1.

Setting a contribution rate at a higher level than required enables us to build up a 'risk buffer' to mitigate the risk associated with such a higher-return strategy. However, as it takes time to build up the buffer, it does not address the higher risk over the short term.

We believe that this option does not align well with Principle 3 (see Section 2). This is because in effect more risk is being taken to meet pensioner liabilities and, if that risk materialises, the cost increase would be split between employers and active members under the cost sharing rules in the absence of an alternative JNC decision. This is challenging in terms of intergenerational fairness. This option may also be challenged in terms of the imminent LTO requirements.

We are furthermore concerned that there may be considerable stakeholder pressure in the future to get access to the risk buffer (through reduced contributions or benefit increases), thereby reducing its effectiveness as a way of mitigating risk over time.

Nevertheless, we continue to review this option and additional analysis has recently been requested by the VMDF, which is presented in Appendix A. Note that this analysis is preliminary and subject to change.

7.4 Putting these outputs in context

Note that these outputs are only indicative at this stage and provided only for illustration. The final position will depend on many factors including:

- The final choice of methodology.
- Feedback from employers with respect to covenant, risk appetite and the potential for material contingent support.
- Our final view of the covenant and risk appetite.
- The results of updated demographic analysis as at 31 March 2020.
- The market conditions prevailing on 31 March 2020.

We will also need to consider the outcomes resulting from the Government's consultation on RPI reform from 2030 and any impact this has on market prices for gilts and expectations for future levels of CPI.

8. Feedback sought

As a participating employer with an obligation to financially support members' benefits, your views on this document are vitally important. No decisions have been taken at this early stage.

The nature of the defined benefits we are tasked with funding means we need to have a very high level of confidence that the money will be there when our members come to retire. This requires balanced, collective judgements informed by evidence and circumstance.

We welcome your feedback – via UUK but copied to us – on our proposed methodology, your ongoing support to the covenant and the Scheme, and your risk appetite.

Please make sure your feedback is clear and as specific as possible. Your responses will influence the assumptions for the formal consultation with UUK on the Technical Provisions, expected to begin by July, and which will determine the outcome of the 2020 valuation.

We have signposted in the questions below where there is key information in the preceding sections and supporting tables and appendices you may wish to refer to, so that the potential implications of your responses are as clear as possible.

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1. What are your comments on the proposed new methodology? (See Section 2)

2. Do you support the measures to ensure the covenant is "Strong" agreed as part of the 2018 valuation on: i) the permanent rule change on employers exiting the Scheme to underpin a 30-year covenant horizon; ii) debt monitoring arrangements; and iii) *pari passu* security on new secured debt. (See Section 3)

3. Do you wish to consider additional tangible covenant support measures to further strengthen the covenant and potentially support additional risk taking? (See Section 3 and Appendix C)

4. Do you have initial views on whether you would be comfortable with an investment strategy that took a moderately larger amount of risk in the long term? (See Section 5)

5. Based on the example approach to managing risk, as set out in this document, what is your risk appetite? In other words, do you have initial views as to how much of your risk capacity you are comfortable for us to rely on in supporting the Scheme, in the knowledge that there are adverse scenarios in which this may be called? (You may wish to express this as a contribution of *x*% of salary, or a monetary amount, paid over *y* years.) (See Section 4)

9. The timetable

This is an outline of the timetable for completing the 2020 valuation by the legal deadline of 30 June 2021 and in time for any changes required to be addressed before the planned October 2021 increase comes into effect. In practice, it is likely to evolve as we will be engaging throughout with UCU and UUK on their requirements and as the valuation outcomes become clearer – but we will need to constantly be working towards meeting the statutory deadline.

May '20:	Informed by feedback on this discussion document, the Trustee Board will agree the financial and demographic assumptions and methodology it proposes to formally consult with UUK on for the valuation
July '20:	We will formally consult UUK over six weeks on these proposals to finalise our view of the scheme's funding position and identify the overall contribution rate required; we will support UUK in its engagement with employers as required, and will also engage with the JNC, UCU, members and the Pensions Regulator
Mid-August '20:	We will inform the JNC of the overall contribution rate needed
Nov '20:	This is when the JNC needs to have decided how to address the contribution rate
Dec '20-Feb '21:	If the JNC decides to make any changes, or cannot reach a decision, this is when employers might need to prepare for a consultation with affected employees
30 June '21:	This is the deadline for filing the valuation with the Pensions Regulator
October '21:	This is when contributions are scheduled to increase under the 2018 valuation

9.1 Our commitment

We recognise that this is a challenging timetable and that the outcome could lead to difficult discussions. To support all our stakeholders through this process, we will engage proactively and constructively so that informed decisions can be made in a timely fashion. This is in keeping with our commitment to the Shared Valuation Principles agreed with our stakeholders, available here.

Ultimately, working with our stakeholders, we must arrive at an overall contribution rate that protects the security of the benefits promised to our members now and into the future, against a background of significant economic uncertainty and difficult market conditions.

We must, by law, consult with UUK on the Technical Provisions, the Schedule of Contributions and the Recovery Plan. We will do more than just what the law requires as we believe that engaging more widely and more effectively can result in an outcome that our members, our sponsoring employers, and the Pensions Regulator, can understand and support. This discussion document is an important part of that dialogue.

We have already established discussion forums and working groups with UCU and UUK to inform the 2020 valuation. We will hold presentations and release updates and documents directly and via our website **uss.co.uk** at key milestones.

Any actuarial work referred to in this document was created to assist the decisions of the Board of USSL only, as the only "user" for the purposes of compliance with Technical Actuarial Standards ("TAS"). Accordingly, the actuarial work and the references to it in this document have not been assessed in line with the TAS requirements as they might apply in relation to any other party. Any party other than the Board of USSL as the intended user should obtain its own actuarial advice on these matters to assist its decisions.

APPENDIX A: The Valuation Methodology Discussion Forum

The Valuation Methodology Discussion Forum (VMDF) is a forum for stakeholder members, as representatives of UCU and UUK, to discuss alternative approaches to valuation methodology, and provide input and feedback to the Trustee to inform its considerations of the methodology to be used in the 2020 valuation.

The forum's attendees include members of the USSL Trustee Board (those directors who participate on the Trustee's Valuation Methodology Working Group (MWG)) the USS Executive, the Scheme Actuary, as well as UCU and UUK representatives and their actuarial advisors.

The forum's purpose is to:

- Consider the valuation methodology, including issues of covenant; risk appetite (trustee, employer, member); investment strategy; expected returns and discount rates; and risk management. It will *not* consider the input assumptions used in the valuation.
- Seek to facilitate a common understanding of issues relating to the valuation methodology amongst the key stakeholders, and provide feedback on how the approach can be clearly explained to employers, members and other stakeholders.
- Provide a channel for stakeholders to submit reasonable requests for further information to the Trustee, and for those requests to be prioritised by the Trustee as appropriate.

The forum has met several times during February and in early March in advance of the publication of this document. It is scheduled to hold further meetings during March and April in parallel with the discussion stage on this document which runs between 9 March and 17 April. We are appreciative of the stakeholders' early engagement ahead of the discussion stage of the valuation.

The VMDF has discussed the high-level principles and considerations set out in Section 2. The Forum has discussed the trade-offs involved and differing views have been expressed around the relative importance of the stability of benefits, contributions and risks. The challenge of balancing simplicity with the need to account for the specifics of the Scheme was also recognised by the forum, including the higher model risk that can be associated with additional complexity.

Within the overall discussion on the approach to the 2020 Valuation the forum has considered the broad issues of risk appetite, prudence, and covenant, as well as the specific elements of our methodology review, including: the differences between Trustee, employer and member risk appetite; the potential use of a dual discount rate approach; removing Test 1; setting the investment strategy; and the potential to take more risk in the valuation.

Indicative valuation results based on 31 December 2019 were also shared with the forum and their interpretation was discussed, including the role of different risk metrics and monitoring approaches.

Finally, we have discussed with the forum our proposed approach to measuring the covenant support available from employers; how that links to the risk appetite of the Trustee and employers; and how that in turn influences the appropriate investment strategy and discount rate.

The VMDF's discussions have not reached a consensus on whether a dual discount rate approach should be implemented, as proposed for consideration in the Joint Expert Panel's second report,

although the members have noted that a dual discount rate appears consistent with the upcoming legislative requirement (via the Pension Schemes Bill) for a Long Term Objective (LTO) for funding, particularly in relation to open schemes.

Under a dual discount rate approach there are differing views held by members of the forum on the appropriate pre-retirement and post-retirement discount rates and, in particular, the extent to which prudence should be factored into the pre-retirement discount rates and the future service contributions.

The discussions have also indicated broad support to consider less derisking and to take more investment risk (by holding more growth assets) in 20 years' time. This could reflect a significant shift from the current derisking strategy in which growth assets would fall from 65% today to 20% in 20 years (based on the outcome of the 2018 valuation, which reflected the employers risk appetite in 20 years' time and the application of Test 1).

However, the forum has differing views on the specific approach to the investment strategy and, in particular, the appropriate allocation to growth assets over time. Some members of the forum are supportive of no further derisking in the Scheme and maintaining growth assets at 65%, subject to understanding the outputs of further modelling and the role that prudence can play in the Technical Provisions to support the Scheme building up a buffer over time to underpin the greater levels of risk that would need to be supported.

The members of the VMDF have asked us to provide further information and modelling to explain why a 'no derisking' approach is outside of the Trustee's risk appetite. They have also made a number of specific modelling requests in relation to that ask. These include:

i) modelling the impact of different "one-in-20" market events run on prudent and best estimate bases with no de-risking, and the required annual contribution rate to reach either a fully funded scheme on a technical provisions basis in year 20 or a fully funded scheme on a technical provisions basis *with* a £5bn buffer; and
ii) modelling the impact of setting contributions fixed at 26% until year 20, even if best estimate investment returns (or higher) are achieved and future service costs fall, to build up a prudent buffer over time (see below for initial analysis of an example of this approach).

These issues will be further explored by the VMDF during March and April.

The forum is also broadly supportive of the removal of Test 1 from the valuation methodology. There is recognition that it needs to be replaced by an alternative for risk monitoring and risk management, which should avoid being overly mechanical in nature and driving the outcome of the valuation in the way Test 1 did in the previous two valuations.

The forum has considered our proposed approach to quantifying the employers' risk capacity and risk appetite under different covenant strength scenarios, including the use of the Free Cash Flow (FCF) approach illustrated in Section 3 and Appendix B, and the ballpark estimates of what covenant capacity might be reasonably available under 'tending-to-strong' and 'strong' covenant ratings.

The Trustee has explained to the Forum the basis of the covenant dashboard that is currently supporting the rating of 'strong' but on 'negative watch'.

While the areas of ongoing discussion are primarily issues that can influence the range of valuation outcomes arising from the methodology, rather than the fundamental elements of the methodology itself, they are considered important issues to explore in order to build confidence and understanding between the Trustee, stakeholder bodies and employers and members more generally.

Where there are outputs from the VMDF that are considered to be informative for a broader range of stakeholders to support the discussion stages of the 2020 Valuation we will seek to make these more widely available, where appropriate to do so.

Analysis of a higher expected return option requested by the VMDF

As we have mentioned earlier in this document, the VMDF has been exploring an option involving a higher-return (and higher-risk) investment strategy than the dual discount rate examples presented in Table 7.2. This higher-return option is the 'no-derisking' case in Table 7.1, but with a contribution rate set a higher level than required by the FSC for this strategy, in order to build up a 'risk buffer' to mitigate the risk associated with the strategy.

We have some concern that, with this option, there may be considerable stakeholder pressure in the future to get access to the risk buffer (through reduced contributions or benefit increases), thereby reducing its effectiveness as a way of mitigating risk.

Nevertheless, we are continuing to review this option and an initial analysis has recently been requested by the VMDF. The results of this are still preliminary and subject to change, but they are presented below in Table A.1, with the 'strong' covenant dual discount rate case included for comparison.

The analysis requested by the VMDF involves the 'no derisking' strategy based on the investment portfolio prevailing at 31 December 2019, without any further derisking over the next 20 years. In Table A.1 we make the same assumptions for both cases to facilitate comparison. Specifically we assume:

- Contribution rates are fixed for both cases (for illustration we assume the 2018 Schedule of Contributions, which is currently 30.7% rising to 34.7% on 1 October 2021 and then falling to 28.7% at the end of the recovery period on 1 April 2028).
- Prudent investment returns are realised in both cases.

With the same contribution rates and prudent investment returns to facilitate comparison, Table A.1 compares projected self-sufficiency position at the end of the 20-year period, along with the resulting covenant support requirement. For ease of comparison, the investment strategy for the 'no-derisking' case has been taken to be 65% growth assets (corresponding to the pre-retirement portfolio), and 35% assets corresponding to the post-retirement portfolio. By comparison, the investment strategy under the 'strong-covenant' case has been assumed to shift from an initial split between pre- and post-retirement portfolios of 55%/45% to a final split of 50%/50% over 20 years.

The prudent investment returns assumed for the pre- and post-retirement portfolios are 'gilts + 2.5%' and 'gilts + 0.75%' respectively. In the yield reversion scenario, gilts are assumed to return CPI - 3.44% over the first 10 years while yields revert, and CPI + 0.61% thereafter. In the scenario without yield reversion, gilt returns are assumed to be in line with the yield curve at 31 December 2019.

In all cases the scheme has been assumed to remain open to new members and benefit accrual, with payroll growing at CPI+2%, consistent with the assumptions underlying Tables 7.1 and 7.2. The same allowance for RPI reform has also been made.

Table A.1. Preliminary projection results for the current portfolio with no derisking vs. the 'strong' covenant case. We assume the current Schedule of Contributions and prudent investment returns for both cases.

31 Dec 2019	**With yield reversion**			**Without yield reversion**		
	SS Deficit in 2040 (£bn)	Risk Impact in 2040 (£bn)	Covenant support requirement 2040 (£bn)	SS Deficit in 2040 (£bn)	Risk Impact in 2040 (£bn)	Covenant support requirement 2040 (£bn)
2018 methodology no derisking	6	17	23	22	23	45
DDR methodology 'Strong' covenant	10	15	25	25	21	46

The indicative results in Table A.1 show that by 2040 the 'no derisking' case:

- Has a lower self-sufficiency deficit, because it has higher expected returns.
- Has a higher risk impact, because it is a higher risk strategy.
- Has a lower covenant support requirement.

From this we conclude that the 'risk buffer' built up over the next 20 years could provide effective risk mitigation by 2040 with sufficiently high contributions. However, over the short-to-medium term it is higher risk than the 'strong' covenant dual discount rate approach.

APPENDIX B: Covenant capacity analysis

This appendix sets out a high-level overview of the Trustee's assessment of the covenant capacity of the sector based on the net present value of the free cashflows. This is one way to evaluate the maximum risk capacity of employers and how it might change with reassessment of covenant strength. As we have explained, this capacity must support *all the risks* that employers are facing, and we would expect that the amount on which the Scheme can rely would be substantially lower than this amount.

The assumptions on which this analysis is based are set out below to provide transparency around the free cash flow calculation (see also Table B1). They will continue to be further developed as part of the ongoing work being carried out by our covenant advisors PwC and EY-Parthenon.

The results are summarised in Figures B1 and B2 for 'strong' and 'tending to strong' covenants respectively.

The calculation

The estimated risk capacity is **the sum of**:

1. **Net cash and financial investments** held by employers. (We have defined this as: cash plus cash equivalents and short-term investments, plus long-term financial investments, less external borrowing). This is representative of the available cash and other assets not directly required for ongoing operations and after paying down debt. It excludes other assets held by the institutions such as land, buildings, student accommodation, research facilities etc. We are aware that some assets may be restricted or pledged or otherwise unavailable to the Scheme, and to the extent they are the result of this calculation may be overstated.
2. **The net present value (NPV) of future free cashflow** of the employers in aggregate.
    - This is based on projections using current data and assumptions about what might happen in the future.
    - We have identified operational cash flows and then deducted depreciation as a proxy for long-run capital expenditure. We recognise that this assumption can be improved and we are working on that.
    - We have also added back USS contributions. We separately make allowance for the cost of future pension provision – see (4) below.
    - We have projected the net cash flow into the future, applying growth rates tailored to each employer according its EY Parthenon segment.
    - The resulting total projected cash flow for each year in the future is then discounted back to give a present value. We have used different discount rates for each of the EY Parthenon segments.
    - In the charts in Figures B1 and B2, we have shown the resulting NPV sub-divided into four components. This is done to illustrate that there is more value in the sector if more years are included in the projection, although uncertainty increases with time and the extent to which it is responsible to include the value ascribed to later years would be dependent on covenant strength. The elements shown in the charts are
        - The NPV of cash flows only in the first 7 years.
        - The additional value arising in years 8 to 20.
        - The further value arising in the years 21 to 30.

- A 'terminal' value representing ongoing operation further than 30 years. In none of our analysis do we consider it responsible to include value this far into the future, but it is helpful to recognise that value is potentially there.

3. **The present value of 2% cost savings over 30 years.** This is a level of saving which, from previous work undertaken by PwC, could be achieved without major long-term impact on the operations of the employers.

Less the following:

4. **The cost of ongoing pension arrangements** to be provided to employees.
    - It is our objective to maintain a sustainable scheme and this implies that current contributions to the Scheme should continue into the long term. Here it can be debated whether the current USS contribution should be used or the best estimate of contributions over 20 years.
    - In evaluating risk capacity, we must consider the situation in which this capacity might actually be called upon. This situation corresponds to a sufficiently adverse scenario. It can be debated what contribution rate should be used for this element. One possible choice is the level of contributions that may be paid *in extremis* should the Scheme be "closed" and another pension arrangement put in its place. This approach may well be appropriate if consideration was being given to a situation in which the risk associated with the DB section of the Scheme had materialised in a sufficiently adverse outcome. Contributions of 15% of payroll have been assumed for future pension cost in this adverse scenario.

As might be expected, the analysis is sensitive to the assumptions. For example, the combined effect of limiting the growth assumptions from year 6 onwards to CPI inflation and increasing each discount rate by 1% would be a reduction of £10bn in the result for the 'strong' covenant.

The assumptions will be reviewed in the coming weeks and, in particular, we will analyse in more detail the growth rates and the levels of capital expenditure which would be consistent with those growth rates. New data will be available shortly from HESA and we will refresh the calculations when it has been released, along with any updated data from Oxbridge colleges.

Table B1: Key assumptions for generation of net present value of free cashflows.

Item	Assumption
Net cash inflow from operations in year 0	Average free cash flow over FY 16-18
Growth rates for net cash inflows excluding pension contributions	***Dependent on segment:*** - Years 1 to 5 2.2% - 5.3% - Years 6 to 15 2.2% - 3.5% - Years 16 to 20 2.2% - 2.6% - Years 21 to 30 2% - Years 30+ 0%
Capital expenditure at year 0	Average of depreciation over FY16-18
Capital expenditure after year 0	Grows in line with cash flows
Discount rate	***Varies by segment:*** - Broad based research 4% - 6% - Cusp 5% - 7% - Teaching and others 6% - 8%
CPI	2%

*Figure B1: NPV of free cash flow as an approach to quantifying risk capacity and risk appetite. This assumes a **"Strong" covenant**. (Note FSC refers to future service cost and FCF to free cash flow.)*

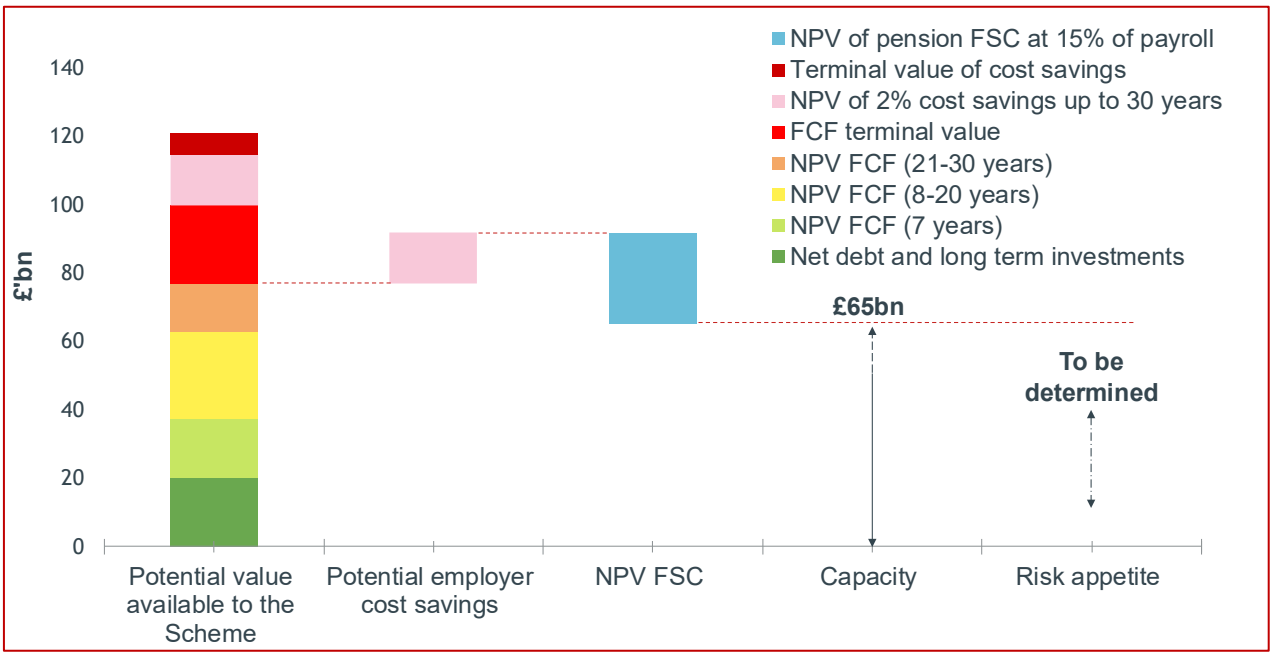
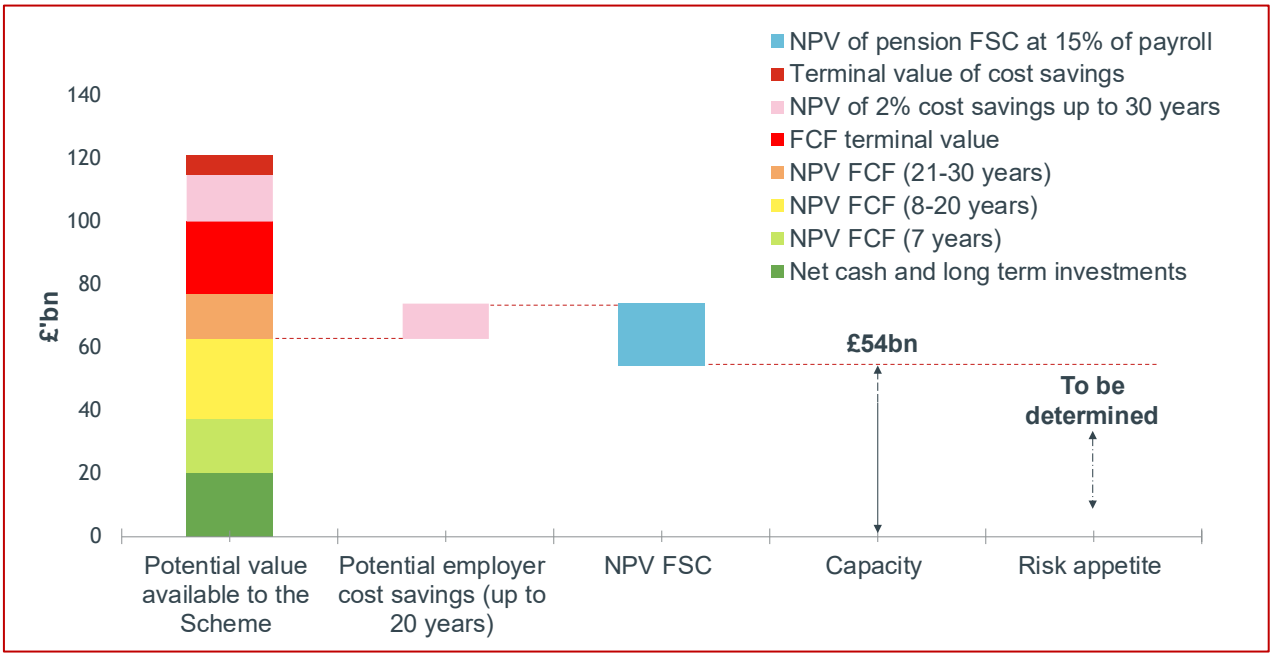


*Figure B2: NPV of free cash flow as an approach to quantifying risk capacity and risk appetite. This assumes a **"Tending-to-Strong" covenant**. (Note FSC refers to future service cost and FCF to free cash flow.)*



Note that **there is a significant concentration** of free cash flow value in the 'Broad Based Research' segment – 24 employers represent 57% of the total free cash flow NPV.

APPENDIX C: Using a contingent support vehicle to provide covenant support

This appendix outlines at a high level how a contingent support arrangement could operate to allow the Trustee to accept lower contributions into the Scheme in the short term, whilst having confidence monies will be readily available if the lower contributions prove to be inadequate.

In essence the arrangement could work as follows:

- Contributions into the Scheme would initially be based on assumptions to be agreed by the employers and Trustee, determined on a more optimistic basis than the prudent assumptions that would otherwise be set by the Trustee.
- Additional contributions would be paid by the employers in to a contingent support vehicle (CSV), which would likely be some form of trust. The level of contribution payable into the CSV will be the difference between the contribution requirement assessed on a more prudent basis set by the Trustee and those paid into the Scheme.
- To the extent that investment experience is more favourable than the assumptions, monies in the CSV will progressively become available to be returned to the employers.
- Should the investment experience fall short of the assumptions, the monies in the CSV will become available to the Trustee and the Scheme.

Figure B.1 illustrates how such a contingent support vehicle could work. For illustration only we have used investment performance of gilts + 2.5% in the diagram below.

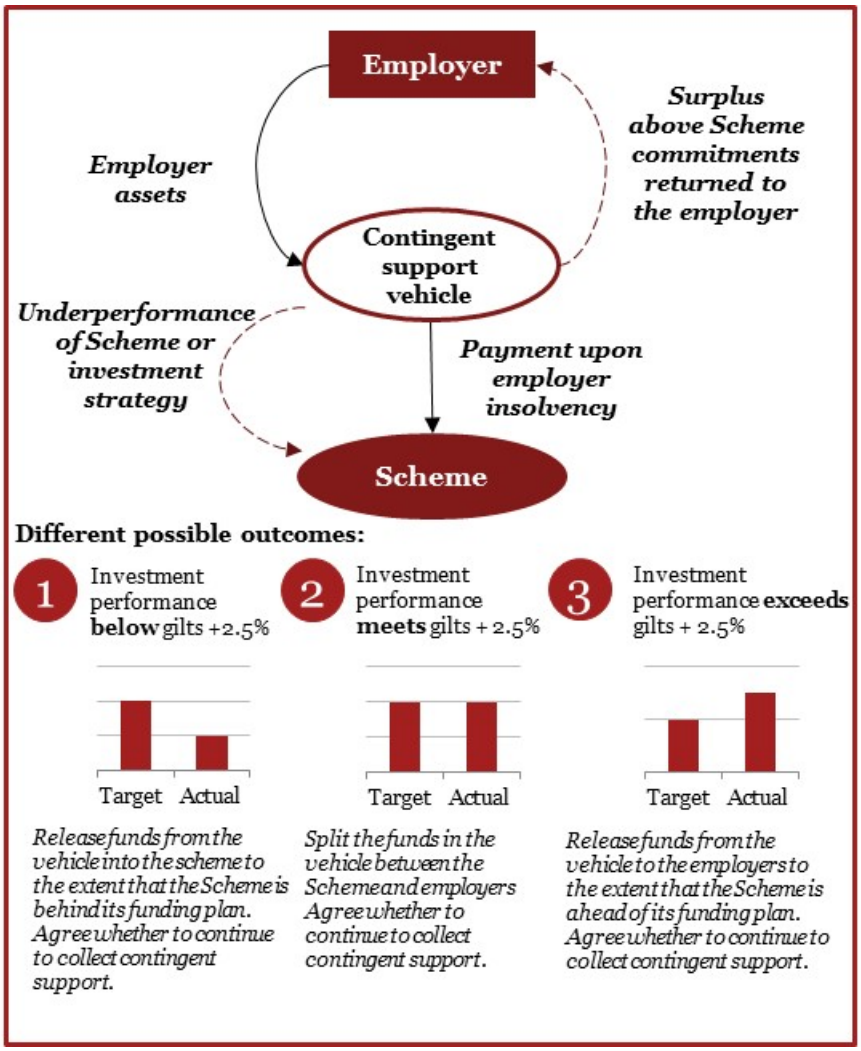
The key considerations which would need to be resolved in putting in place a CSV include:

- The basis for determining contributions into the Scheme and the CSV.
- The frequency and basis upon which the adequacy of the Scheme's experience is assessed for the purpose of the CSV.
- The timing and frequency of tests to release funds from the CSV to the employers or the Scheme.
- The proportion and rate at which monies are released from the CSV.
- The legal structure of the trust. A number of different approaches have been used by other schemes, in order to achieve the optimal accounting and tax treatment as well as dealing with the practical implications of the number of individual employers;
- The period over which the CSV would operate, for example the arrangement could last for, say, 6 years from agreement of the 2020 valuation.

Any vehicle put in place, with your agreement, would need to be legally enforceable, suitable from a tax and accounting perspective and meet the needs of the Scheme and our stakeholders. There are a number of technical issues that would need to work through with any particular option considered further.

How the vehicle is invested is open to discussion. There are arguments for a low-risk asset strategy, noting that the asset allocation of the main Scheme can easily be tilted given its size so that the combination of the Scheme and the vehicle has the desired target expected return.

Figure B.1. Example of the operation of a contingent support vehicle



APPENDIX D: How the Trustee manages risk

The basis for our approach to risk management is to make sure that, at any point in time, there is a very high probability that, should we need to, we can successfully derisk the Scheme and move its investments into a low-risk self-sufficiency portfolio *while the employers can still afford to do so*.

To do this we monitor the difference between the assets the Scheme actually holds and those it would need if invested for self-sufficiency, and we make sure that the employer's covenant and risk appetite can cover the shortfall. *There is, therefore, a direct link between your risk appetite and both the risk we take on your behalf and the point at which we start reducing this risk.*

The buffer between self-sufficiency deficit and risk appetite

When setting the valuation assumptions, the level of assets we seek to hold and the investment strategy, we incorporate a buffer between the self-sufficiency deficit and the lower of your and our risk appetite.

The purpose of this buffer is to allow the distance from risk appetite to decrease due to market fluctuations without us needing to derisk. This ensures that we don't respond to market noise. That is, we don't need to act immediately every time investments fall in value by a small amount or the self-sufficiency liability rises by a small amount. It makes sure we have time to assess the situation and react in a considered and measured way to sustained movements.

The buffer that we build into our calculations is what we refer to as the "risk impact", a measure of how much worse things could get over a year.

More precisely, it is a one-in-20 worse case outcome for the self-sufficiency deficit (the so-called 1-year 95% VaR), currently £19bn. This figure depends upon the investment portfolio the Scheme holds – the riskier it is the bigger the impact we might see in extremis and hence the larger the required buffer. Given the current investment portfolio, the buffer we would ideally hold would be £19bn.

We recognise that markets are volatile and as such the size of the buffer will fluctuate. We can live with these fluctuations as long as the residual buffer provides adequate protection to allow us to put in place measures to protect the Scheme from moving outside risk appetite.

At 31 December 2019 the Scheme's assets were £72.9bn and the total assets that would be required for self-sufficiency (where we expect a much more predictable but lower level of future income) were £97.7bn, giving a self-sufficiency deficit of £24.8bn.

This means that at 31 December 2019 under the current investment strategy, the self-sufficiency deficit plus our desired buffer would amount to £43.8bn (the £24.8bn self-sufficiency deficit plus the £19.0bn buffer). This is greater than the assumed employers' risk appetite of £35bn for a 'strong' covenant by c. £9bn and as such we should consider if the residual buffer of c. £10bn is adequate.

Whilst the current position may be manageable for a 'strong' covenant, it would present a challenge for a 'tending-to-strong' one.

Proposed monitoring and Test 1

While the risk management approach described above and Test 1 are based upon the self-sufficiency deficit, they are actually very different in nature.

Test 1 used your stated risk appetite to set a target self-sufficiency deficit in 20 years' time, and from this back-solved for the maximum amount of investment risk, along with the derisking path to get the Scheme to this target. It was therefore primarily used as a way of reflecting employers' stated risk preferences in the valuation. It was not, strictly speaking, an ongoing risk management approach.

What we have described above is the actual risk management approach that, subject to consultation, we propose to take. Its main purpose is to manage risk over time, rather than to drive the valuation. To the extent that it is used within the valuation its role is to indicate whether, or not, the level of investment risk is acceptable.

APPENDIX E: Assumptions

Financial assumptions

The two key financial assumptions are the expected investment returns and the development of inflation, specifically CPI and RPI.

Expected investment returns: Our forecasts of investment returns for our investment strategy will be derived from our established Fundamental Building Blocks model, which has recently been reviewed and remains fit for purpose. The way they are used in the 2020 valuation will change, to reflect our 'budgeting exercise' approach. We plan to use a 30-year average expected return, which for simplicity will be expressed relative to gilts. In the methodology adopted for the last two valuations we used two distinct periods to develop forecasts for expected returns and the evolution of gilt yields: a 10-year transition period to equilibrium followed by a 20-year equilibrium period.

Expected returns as at 31 December 2019: The table below sets out return expectations by main asset class relative to CPI as at 31 March 2018 and 31 December 2019.

Table E.1. Expected returns over CPI.

30 year expected real returns by asset class (p.a.)	March 2018	December 2019
Equities	4.03%	3.87%
Property	2.16%	1.84%
Listed Credit	1.58%	1.37%
UK Index Linked	-0.66%	-0.87%
Cash	-0.30%	-0.43%

Gilt yield projections: We continue to believe there will be some increase in real gilt yields towards equilibrium levels (which are below 2014 gilt yields) over the next decade, but that the equilibrium real gilt yields are lower than assumed in 2018.

Table E.2. Projections for real gilt yields.

20-year index-linked gilt yields Valuation date	Real yield at valuation date	Projected real yield in equilibrium (prior to allowance for RPI reform)
31 March 2018	-1.68%	-0.37%
31 December 2019	-1.95%	-0.39%

Inflation: Our forecast for future inflation is developed from a calculation of the breakeven inflation implied by the difference between index-linked gilt yields and nominal gilt yields, adjusted for the inflation risk premium and the average spread between CPI and RPI inflation metrics.

Discount rates: The discount rates will reflect our prudent expectation of the investment returns on the assets we expect to hold in respect of members before and after retirement (see Section 5). As discussed in Sections 3 & 4, the level of investment risk we can take is dependent on the employers' covenant and their risk appetite. Our intention is to use a similar level of prudence in the discount rate relative to our expected returns as in the 2018 valuation but recognising that we will also check that the overall risk in the investment and funding approach will remain in risk appetite over time.

CPI: All the benefits provided by the Scheme, with a very few exceptions, are linked to CPI. We therefore need to take a view as to how CPI will develop over time.

At past valuation we have used market implied RPI less a fixed margin (130 basis points) to estimate CPI, where market implied RPI is the difference between the yield on nominal and index-linked Government bonds.

Since the 2018 valuation, the Government has confirmed it is reviewing the RPI inflation measure with potential changes being implemented from as early as 2025 but more likely after 2030.

The potential changes stemming from this review are partially factored into the index-linked gilts yield as at 31 December 2019 and, as such, distort the market implied RPI.

The level of distortion is a matter of debate and we are still working to model the potential impact. A consultation document is expected from the Government in March which will hopefully provide greater clarity of the proposed reforms to RPI and timescales.

In producing the indicative results, we have produced figures allowing for RPI reform on the basis that the current methodology understates expected CPI inflation by 20 basis points a year. The self-sufficiency assumptions allow for CPI being 50 basis points higher than in the Technical Provisions.

Other assumptions

Our other assumptions are non-financial in nature, including assumptions about the evolution of the sector and of the member demographics.

Growth of the sector: For the purposes of this document we have assumed that aggregate payroll of the employers is growing at CPI + 2%, consistent with 2017 and 2018 valuations. This will be re-evaluated post 31 March 2020.

Demographic: These will be re-evaluated as at 31 March 2020 but, for the purposes of this document we will use the same demographic assumptions as we used for the 2018 valuation.

APPENDIX F: Key technical components of our proposed methodology

Investment strategy[2]

- Determined by risk appetite; set by "tail risk" constraints and stress tests.
- Low-risk strategy for pensioners.
- Growth strategy for active and deferred members pre-retirement (i.e. higher risk and potential return).

Expected investment returns & interest rates[3]

- Fundamental Building Blocks (FBB) model of future investment returns.
- Consider average returns over 30 years for Technical Provisions calculation.
- Reconsider current gilt yield assumptions (equilibrium vs forward curve).

Discount rates[4]

- Based on expected (best estimate) investment returns.
- 'Best estimate' less a margin for prudence.
- Consider dual discount rates (one for pensioners, one for active and deferred members pre-retirement).

Recovery plan

- A fixed recovery period.
- Assume a degree of outperformance of returns over the prudent discount rate.
- Identify an acceptable range of assumed outperformance.

Future service contribution

- Prudence in future service contribution is 'capital' not 'cost'.
- "Best estimate" plus a margin for prudence, which may differ from that for TP.
- Identify an acceptable range for future service contribution vs cost.

[2] For the 2017 and 2018 valuations, we used one investment strategy for all cohorts
[3] For the 2017 and 2018 valuations, we considered returns over two distinct periods (10-year transition to gilt yield equilibrium followed by a 20-year equilibrium period)
[4] For the 2017 and 2018 valuations, we used a 'term structure' for a single discount rate