Universities Superannuation Scheme

2018 Actuarial Valuation

A Framework for Contingent Contributions

7 February 2019

Contents

1. Introduction

This document sets out a framework for contingent contributions, which was outlined at a high level in the Technical Provisions and Statement of Funding Principles consultation document for the 2018 Actuarial Valuation (the "Consultation Document"). See the Consultation Document section 7.3, pp. 20-21 and Appendix D, pp. 29-30.

The starting point for contingent contributions is the so-called "upper bookend" for 2018 technical provisions (Section 7.1 of the Consultation Document, pp. 17-19). The upper bookend refers to the contribution required by the Trustee in the absence of contingent support. This amounts to **33.7%** of salary (being the sum of the future contribution requirement of 28.7% and a deficit recovery contribution of 5%).

With a sufficiently strong arrangement to provide contingent support, the Trustee believes it is possible to grant a rebate against the upper bookend and as such agree a base level of contributions that is lower than this upper bookend. This is explained in Section 7.2 of the Consultation Document (pp. 19-20), where it was noted that the Trustee's "lower bookend" with appropriately robust contingent support is a contribution rate of slightly less than 30% of salary.

Section 2 of this document presents a rationale for the contingent contribution framework that is discussed in this document. This is followed in Section 3 by a summary of the various contingent arrangements that have been used in other UK pension schemes.

Section 4 then presents 11 principles that the Trustee considers must underpin any contingent contribution arrangement. These principles support the framework for contingent contributions that is presented in Section 5 and must also underpin any agreed input parameters.

The contingent contribution framework described herein is a development of the tentative outline provided in the Consultation Document.

2. Rationale for a contingent contribution arrangement

As explained in the Consultation Document, there are a number of ways in which the valuation methodology and assumptions could be adjusted in order to achieve a contribution rate of slightly less than 30% of salary, instead of the upper bookend of 33.7%. All of these involve the Trustee adopting more risk in funding the scheme. The Trustee believes it would be possible to justify this providing there were steps in place to rectify the scheme's financial position should this additional risk crystallise in the form of an adverse funding outcome.

A major component of the upper bookend contribution rate of 33.7% is the deficit recovery contribution (DRC) of 5%. The Consultation Document explained that the main reason for requiring this level of DRC was the level of risk associated with the scheme's short-term reliance on the employers' covenant (see Section 7.1, pp. 17-19). Between 31 March 2014 and 31 March 2017 short term reliance (measured as the difference between the assets required on the self-sufficiency basis and those currently held by the scheme) increased from £11.6bn[1] to £22.4bn. At 31 March 2018 it amounted to £20.8bn.

Whilst the Trustee believes there is a credible path to an acceptable level of reliance in 20 years' time, there are considerable downside risks that need to be managed in that process. The concern is that reliance could grow to such a level that employers cannot collectively support it. To date, the amount of long-term reliance that the sector has been prepared to support has been evaluated in terms of additional contributions, expressed as a percentage of salary over time. Table 1 gives the percentage of salary required over different time periods to meet different levels of the self-sufficiency deficit.

Table 1: Contributions required to meet different self-sufficiency deficits over different periods (% of salary).

Years over which additional contributions payable	10yrs	20yrs	30yrs
Self-sufficiency deficit			
£20bn	22.8% p.a.	10.5% p.a.	6.4% p.a.
£23bn	26.2% p.a.	12.1% p.a.	7.4% p.a.
£25bn	28.5% p.a.	13.2% p.a.	8.1% p.a.

Reducing contributions below the upper bookend increases the risks associated with funding the scheme. Contingent contributions provide a means of lowering the base contribution rate and controlling risk by collecting additional contributions when they are most needed. Having a high fixed contribution rate is a very blunt instrument for addressing additional risk in any actuarial valuation, since this must be paid in scenarios with good outcomes as well as in scenarios with adverse outcomes.

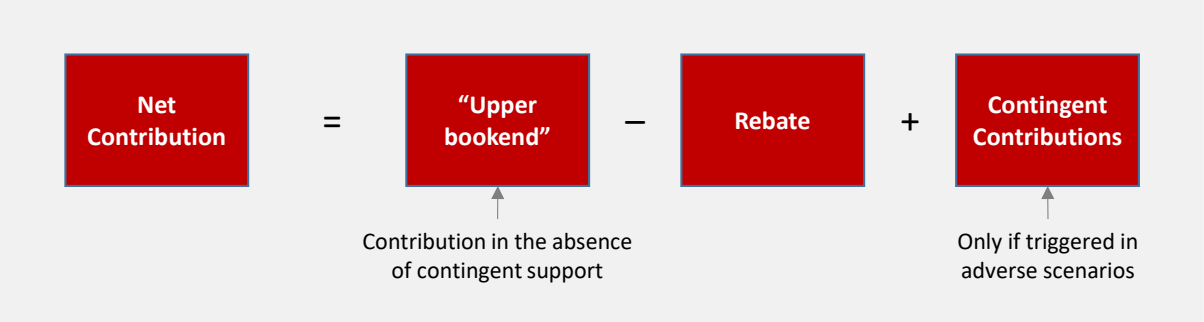
[1] The £11.6bn for 2014 corresponds to measurement of self-sufficiency on a similar basis to 2017 and 2018, i.e., using a discount rate of gilts + 75bp.

By contrast contingent contributions are more precise in that they target only those scenarios with adverse outcomes.

With an appropriate contingent contribution arrangement that incorporates an agreed automatic response should the above risks materialise, the Trustee believes it can justify lowering its required contribution rate, essentially providing a "rebate" against the upper bookend. This rebate is provided in exchange for the contingent contribution arrangement, which effectively reduces the rebate in scenarios in which it is triggered.

Under such an arrangement, the net contribution may be represented as detailed in Figure 1.

Figure 1: Net contribution rate under the contingent contribution arrangement discussed in this paper.



3. How other pension schemes have used contingent support

Contingent contribution arrangements are only one of a range of contingent risk mitigation mechanisms that have been used by UK trustees and employers to support defined benefit pension schemes and ensure adequate funding.

In Mercer's universe of schemes which had an actuarial valuation in 2016 or 2017 some 45% (of a total of around 360 schemes) had some form of contingent risk mitigation in place, or were in the process of agreeing such an approach.

The various forms of contingent risk mitigation include:

- Parent (or other group company) guarantees;
- Contingent contribution arrangements;
- Escrow agreements;
- Special purpose vehicles;
- Charges over other assets (including property;
- Letters of credit (aka bank guarantees);
- Negative pledges.

Whilst parent guarantees are the most popular form of risk mitigation provided (73% of the schemes with or considering contingent arrangements), contingent contributions are the second most popular (21%).

The rationale for adopting contingent contribution arrangements is generally very specific to the circumstances of the individual schemes. The objectives of such an arrangement include:

- To manage the funding level of the scheme to ensure it does not become excessively funded;
- To address non-funding related issues, such as profit/dividend related triggers or changes in corporate structure and covenant strength;
- To balance differences in views between the trustee and sponsor on investment strategy and recovery plans.

Where the contingent contributions are triggered by the funding level this is, in the vast majority of cases, measured on a technical provisions basis, which for the vast majority of scheme's in the Mercer universe is based on "gilts plus".

Many of the triggers focus on maintaining 100% funding with contributions being payable to restore this level over a relatively short period and ceasing when the target is reached.

Negative pledges have been used for some schemes and are useful in protecting the long-term value of the covenant provided by the employers. Implementing negative pledges in multiemployer schemes is challenging in terms of documenting the pledges and ensuring the conditions are applied equally across all employers. The Trustee believes that they are not, however, a substitute for higher, or contingent, contributions.

The contingent contributions framework outlined in this paper has similarities to those adopted by other trustees in that it is focused on the particular circumstances and issues faced by USS.

4. The Trustee's principles for contingent contributions

The Trustee has formulated a number of principles that any acceptable arrangement for contingent contributions should satisfy. These principles are listed below.

Principle 1. Efficacy

The structure of any contingent contribution arrangement should be practical, transparent, unambiguous and as simple as possible.

As such, this means that the framework for contingent contributions must avoid being overly complex and focus on being as practical, straightforward and clear as possible. This means, for example, that changes to contribution levels should probably occur on fixed dates following an agreed notice period after a trigger event. Furthermore, any increase in contributions should remain in force for a minimum period of time.

Principle 2. Objective metric

The metric that is used to trigger contingent contributions should be objective and not require subjective judgments, interpretations or a decision-making process.

This means that the definition of the metric must be clear and unambiguous so that it can be evaluated in a straightforward and objective way. Any two people armed with the definition and appropriate data should agree on their calculations for the value of the metric and whether or not there is a trigger event. Because of this principle, it is difficult to see how a technical provisions measure of the funding deficit can be an appropriate trigger metric, unless it is measured on a "gilts-plus" basis.

Principle 3. Alignment

The mechanism for triggering contingent contributions should be sufficiently sensitive to data that could signify that current contributions may not be adequate.

This means that the mechanism for contingent contributions must be aligned to the underlying reason or concern behind the requirement for contingent contributions, and must lead to a trigger event that reflects that concern at the appropriate time.

Principle 4. Robustness

The mechanism for triggering contingent contributions should be robust in the sense it is not triggered solely in response to short-term market volatility.

This means that, despite the fact that asset values and financial market rates and yields are highly volatile, the trigger mechanism for contingent contributions must be designed to respond to medium-to-long term adverse scenarios and be largely immune from short-term volatility. Taking an average of the trigger metric is one way to mute short-term volatility. Another is to require the trigger metric to remain above the threshold for a minimal period of time before contingent contributions are triggered.

Principle 5. Safety valve

Contingent contributions once triggered should be terminated over a reasonable period should data suggest that they are no longer needed.

This means that the mechanism for contingent contributions must respond appropriately to the situation in which an adverse scenario reverses, leading to a significant improvement in funding and/or a reduction in risk. In such a situation, contingent contributions should be terminated in a reasonable time frame.

Principle 6. Materiality

Contingent contributions once triggered should be sufficiently material such that, if they were sustained over the long term, they would substantially improve the funding position in adverse scenarios.

This means that contingent contributions should make a significant impact in terms of rectifying adverse scenario outcomes.

Principle 7. Quantum

In adverse scenarios in which contingent contributions are triggered, the aggregate quantum of the contingent contributions should broadly similar to the Trustee's contribution requirement in the absence of contingent arrangements over a reasonable period of time.

This means that contingent contributions, when triggered in an adverse scenario, should perform a broadly similar improvement role in that scenario to what non-contingent, fixed contributions would have done. There should be no significant detriment to the funding position (relative to fixed contributions) over a reasonable time period after the start of an adverse scenario. Another implication of this principle is that the time lag between a trigger event and the introduction of contingent contributions must not be excessively long.

Principle 8. Durability

The contingent contribution arrangement should remain in place until a revised Schedule of Contributions comes into force following a future valuation.

This means that the contingent contribution arrangement should be designed and committed to as a long-term arrangement, just as for regular, fixed contributions as part of a recovery plan in any typical valuation.

Principle 9. Covenant

The contingent contributions should be consistent with the findings of the most recent review of the employers' covenant.

This means that the sizing and timing of contingent contributions should be appropriate to the covenant results. This means stepping up contingent contributions over time, rather than jumping immediately to a high level. It also means setting a cap to the maximum size of contingent contributions.

Principle 10. Legally binding

The contingent contribution arrangement should be legally binding and documented as part of the Schedule of Contributions.

This means that contingent contributions must be paid in the same way that regular, fixed contributions must be paid.

Principle 11. Payment certainty

The Trustee must be sufficiently comfortable that contingent contributions would be paid in full if triggered.

This means that the trustee must have complete confidence that contingent contributions can and will be paid, when triggered, as they fall due.

5. A contingent contribution framework consistent with the principles

The contingent contribution framework that we describe in this section has been designed to fulfil the objective of providing higher contributions only when they are needed, i.e., in adverse scenarios. Furthermore, it has been formulated to be consistent with all of the Trustee's Principles described Section 4.

Note that we describe only the structure of the framework and do not specify what suitable values might be for the parameters. Nor do we present any analysis.

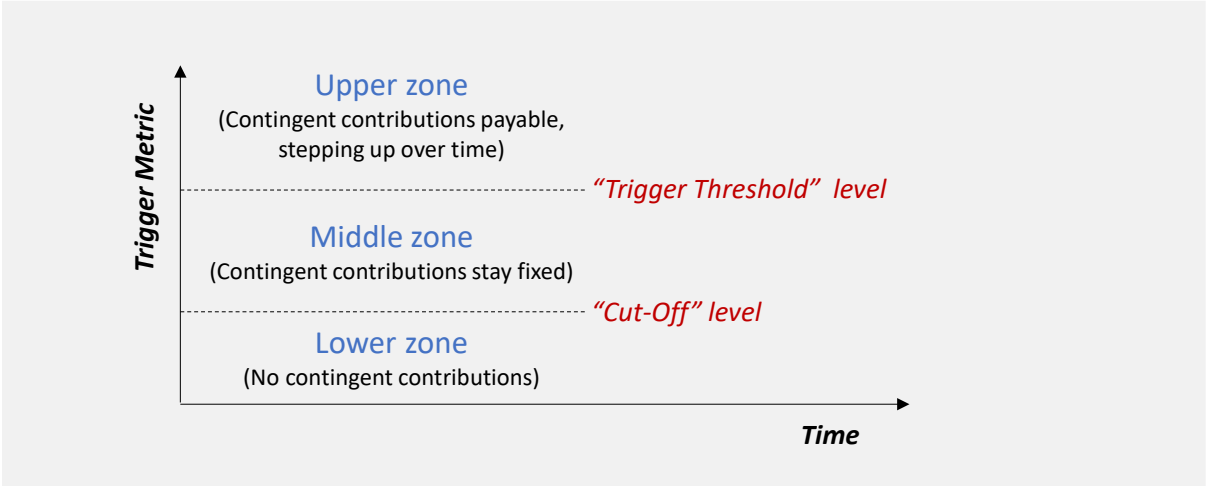
5.1 Overview of the structure

Essentially, the arrangement works as follows. Instead of paying the full required contribution rate equal to the upper bookend of 33.7% of salary, employers pay a lower *rebated* contribution rate, but with the caveat that they must pay additional contingent contributions on top of this rebated rate should they be needed. Effectively the contingent contributions offset some or all of the rebate, but only in adverse scenarios. This arrangement leads to a significantly lower expected cost over the long term, but at the same time provides protection to scheme funding when it is needed.

In this structure, contingent contributions are controlled automatically through the values of a particular "trigger metric". There are three ranges of outcomes, or "zones", for the trigger metric and three corresponding states for contingent contributions (see Figure 2). The relationship between contingent contributions and the zone in which the trigger metric falls is as follows:

- *Upper zone:* Contributions step-up over time up to a maximum. (If the trigger metric is in this zone for a minimum period then contingent contributions will kick-in and rise in predefined steps, up to a maximum).
- *Middle zone:* Contributions stay constant. (If the trigger metric is in this zone for a minimum period then contingent contributions remain unchanged, i.e., if they are zero they remain at zero, if they are 2% they remain at 2%).
- *Lower zone:* Contributions fall to zero. (If the trigger metric is in this zone for a minimum period then contingent contributions are reduced to zero).

Figure 2. The three zones for the trigger metric which are proposed for the contingent contribution approach.



Defining the arrangement in this way provides the basis for consistency with Principle 1 (Efficacy) and Principle 5 (Safety valve).

5.2 How it works – practicalities

If adverse scenarios materialise, the trigger metric would move into the upper zone, triggering contingent contributions which partially offset the contribution rebate. If the trigger metric remains in the upper zone, above the predefined trigger threshold, then contingent contributions would increase periodically, further offsetting the contribution rebate. However, even if the trigger metric remains in the upper zone, contingent contributions would stop increasing once a predefined maximum contribution has been reached. These step-up features are consistent with Principle 9 (Covenant).

If, once contingent contributions have been triggered, the trigger metric should fall back into the middle zone, then contingent contributions are held fixed at whatever level they were before they entered the middle zone. If, however, the trigger metric should fall all the way into the lower zone, then contingent contributions would cease and the full rebate would be reinstated.

There are some important practical points regarding the operation of the arrangement:

- Employers should be given a pre-specified notice period before contingent contributions would become payable.
- Once the trigger threshold has been crossed, the trigger metric should remain in the new zone for a minimum period of time before contingent contributions start.
- Once a new level for contingent contributions is set, it should remain in force for a minimum period of time.

Note that the overall size of contingent contributions should be sufficiency large to satisfy the requirements of Principle 6 (Materiality).

For consistency with Principle 7 (Quantum), the maximum contingent contribution is likely to be slightly greater than the contribution rebate. This would be necessary to make up for the periods in which contingent contributions are still stepping up and are consequently below the level of the rebate. This is slightly different from the outline in the Consultation Document.

5.3 The trigger metric

The trigger metric should be consistent with Principles 1 (Efficacy) and 2 (Objective metric). Specifically, it should be an objective measure which can be calculated unambiguously by different parties, once defined in sufficient detail.

It should be consistent with Principle 3 (Alignment) in that the trigger metric should be a reflection of the risk associated with the reliance on the employers' covenant.

Some potential trigger metrics will not be suitable because they fail Principle 2 (Objective Metric), as they involve subjective judgements and are *not* objective. One example of this is the Technical Provisions Deficit, whose calculation requires up-to-date values of the technical provisions discount rate, which depends on two subjective judgments. The first is an assessment of expected future investment returns and the second is an assessment of the appropriate amount of prudence to be subtracted from the expected return. It may still be possible to define a suitable trigger metric related to technical provisions, but it would need to be modified to be calculated in a fully objective manner.

Another potential challenge with any trigger metric is that it is subject to volatility and may not necessarily be reflective of a sustained change in the scheme's risk position – this is the case of a so-called "false trigger". As such a metric suffering from this disadvantage would not be consistent with Principle 4 (Robustness).

However, this challenge can be addressed by using a moving average of the underlying metric, so that volatility is muted by the process of taking an average over an appropriate period of time. Furthermore, setting a requirement for the metric to exceed the trigger threshold for a minimal period of time before a trigger event occurs would also act to reduce the impact of volatility.

5.4 Trigger threshold level

The level of the trigger threshold is an important parameter in this framework. It sets the level at which contingent contributions will be initiated, once the trigger metric has exceeded this level for a specified period of time. The lower the trigger threshold, then the more likely it will be that contingent contributions are triggered. If it is set too low, then contingent contributions will be triggered by scenarios that don't require them. On the other hand, if it is set too high, such that only the most extreme scenarios trigger contingent contributions, then some very adverse scenarios that really do need such contributions may not be triggered early enough.

Risk appetite is a key input for setting the appropriate level of the trigger threshold. This reflects Principle 3 (Alignment).

5.5 Balancing the risk of missed triggers vs. false triggers

No trigger mechanism is perfect and there is always a risk that this contingent contribution arrangement does not trigger when it should (i.e., an adverse scenario is not identified early enough), as well as a risk that it triggers and thereafter reverts (i.e., a short-term statistical fluctuation triggers the arrangement in a benign scenario). This is related to Principle 4 (Robustness).

There are a number of steps that can be taken to find the appropriate balance between missed triggers and false triggers. These include:

- Defining the trigger metric appropriately. To reduce the volatility in the trigger metric it could be defined as an average over a suitable period of time.
- Requiring the trigger metric to exceed the trigger threshold for a minimum period for a trigger event. This avoids the situation where a short-term spike that does not signify an adverse scenario triggers the arrangement.
- Implementing a contingent contribution "cut-off". By incorporating a cut-off level for contingent contributions, then situations in which there is a false trigger event (due to a medium-term deterioration that is later reversed, for example) can be rectified.

5.6 The lag period

For operational reasons, it will be necessary to define a minimum period after a trigger event to allow time for contingent contributions to be implemented. It is also likely to simplify the operation of the mechanism if the time at which implementation of contingent contributions would take place are fixed dates in the year. Combining both of these leads to a variable lag period, but with a minimum amount of time between triggering and implementation.

Clearly the lag period should not be too long, or the benefit of the contingent contributions that have been triggered will be diminished. Increasing the lag period would necessitate a higher contribution

level to compensate. On the other hand, a lag period that is too short would be operationally challenging.

5.7 The key elements of the framework

The key elements of the contingent contribution framework include the trigger threshold and cut-off levels, as well as the size and profile of the contingent contributions themselves. The full set of framework elements is shown in Table 2.

Table 2. Key elements of the contingent contribution framework.

Framework element	Definition
Upper Bookend	The required contribution rate in the absence of contingent support. This is **33.7%** of salary.
Contribution Rebate	This is the amount by which the regular contribution rate (*Upper Bookend*) is reduced because of the contingent contribution arrangement.
Base Contribution Rate	This is the *Upper Bookend* minus the *Contribution Rebate*. Contingent contributions would be paid on top of this *Base Contribution Rate*.
Trigger Metric	This is the metric that is monitored to see if contingent contributions have been triggered. This should be defined in terms of an objectively calculable metric averaged over a suitable period of time
Trigger Event	Contingent contributions start if the *Trigger Metric* exceeds the *Trigger Threshold* for a certain pre-specified period of time.
Trigger Threshold	This is the level of the *Trigger Metric* above which contingent contributions are triggered (provided the *Trigger Metric* remains above the *Trigger Threshold* for a specified minimum period of time).
Cut-off Event	Contingent contributions cease if the *Trigger Metric* remains below the *Cut-off level* for a specified minimum period of time.
Cut-off Level	This is the level of the *Trigger Metric* below which contingent contributions would cease.
Payment Lag	This relates to the date (subject to a minimum time period) on which contingent contributions would be implemented following a *Trigger Event*. In a similar vein, this also relates to the date (subject to a minimum time period) on which contingent contributions would cease following a *Cut-off Event*.
Minimum Payment Period	Whenever the amount of contingent contributions increases, it must be held at this level for a minimum period before it can change again.
Contingent Contributions Quantum and Schedule	Once triggered, contingent contributions should step up in pre-specified steps over pre-specified time scales, provided the *Trigger Metric* is still above the *Trigger Threshold.* There should be a maximum contingent contribution, which is reached after stepping up from lower amounts.

6. Conclusion

This document has presented the Trustee's principles for contingent contributions and outlined a framework for contingent contributions that is consistent with those principles.