

Valuation Investment Strategy (VIS)

Questions & answers from stakeholder engagement

1. The engagement programme

Over the period November 2021 to early March 2022, the Trustee ran an engagement programme with stakeholders on the Valuation Investment Strategy (VIS). This programme included:

- A meeting with the Joint Negotiating Committee (JNC);
- Meetings with stakeholder representative bodies, in particular, UUK, UCU, and the Employers' Pension Forum (EPF);
- Meetings with individual employers;
- Webinars with employers (two overview webinars and one technical webinar), the recordings and presentations of which are available on the website.

The objectives of this engagement were to:

- Improve stakeholders' understanding of investment strategy in the context of the 2020 valuation and the associated Integrated Risk Management Framework (IRMF);
- Share the Trustee's latest perspective on investment strategy for the 2020 valuation;
- Seek informal feedback on investment strategy in advance of the formal consultation on the Statement of Investment Principles (SIP) which is planned to take place during April; and
- Help employers, in particular, prepare for the formal SIP consultation.

2. Feedback received

As part of the engagement programme, the Trustee actively solicited and received feedback from stakeholders on the VIS and investment strategy more generally. This was received mostly orally in the meetings, but also in written format.

A total of six written feedback submissions were received from individual employers, groups of employers and stakeholder representative bodies.

The feedback on the VIS did not raise any concerns from the vast majority of employers, with the exception of a relatively small number of institutions.

Only a small number of stakeholders raised specific questions, challenges and/or concerns. Our response to the most significant of these is presented in the next section, in order to help employers prepare for the formal SIP Consultation.

The key areas of feedback were:

- The allocation to growth assets;
- The hedging of liability-related risks;
- The use of leverage in the investment strategy;
- The role of self-sufficiency in the investment strategy.

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Allocation to growth assets

There was a clear widespread view early in the engagement that the allocation to growth assets should not be reduced below the current level of 60%. The Trustee has taken that feedback on board in its proposal for the VIS.

Hedging

Feedback on the hedging of liability-related risks (specifically, inflation risk and interest rate risk) was more varied, falling into three categories. At one extreme, some stakeholders felt that such hedging should be limited or eliminated entirely because it can reduce expected investment returns. At the other extreme, some stakeholders wanted the Trustee to consider even greater levels of hedging to limit the volatility of future deficits and its impact on contributions. Then there were also stakeholders who thought that hedging was a good idea in principle, but now was not the right time to implement it.

We discuss the issues relevant to hedging in the next section of this paper and answer the key questions raised by stakeholders (see Q1 and Q4).

Leverage

A number of stakeholders raised concerns with the proposed increase in leverage under the VIS and asked whether this would increase the level of risk in the Scheme and what measures USS Investment Management would take to manage these risks.

In the next section we discuss the additional risks associated with leverage and the control measures that USS Investment Management has in place to manage them (see Q5).

Self-sufficiency

A small number of stakeholders questioned the role of self-sufficiency in setting investment strategy. In particular: (i) how did it play into the setting of investment strategy, (ii) was there an alternative approach that does not rely on self-sufficiency; and (iii) what consideration the Trustee had given to a broad range of risk metrics beyond those related to self-sufficiency.

In relation to the first of these points, the role of self-sufficiency in the valuation is broader and more fundamental than how it impacts investment strategy. It has its origins in the valuation's IRMF and the approach to the management of funding risk and covenant risk. Because self-sufficiency is so fundamental to the IRMF, it must clearly have implications for investment strategy. The role of self-sufficiency, its origins and its implications have been discussed at length in other Trustee publications, but for convenience we summarise it again in the next section.

With regard to the possibility of using an alternative approach for risk management that does not involve self-sufficiency, no credible alternative has been proposed that plays the same role.

Finally, because the Trustee views risk as multifaceted, it evaluated a broad set of risk metrics for its consideration of investment strategy.

These issues are discussed more fully in the next section (see Q2).

3. The Trustee's responses to feedback and questions

This section provides the Trustee's responses to the most important questions and challenges raised during the stakeholder engagement programme. These responses cover the four key areas of feedback mentioned in the previous section in addition to others. We have chosen to present the responses in a question and answer format.

Q1. Why is USS proposing to increase liability hedging now, given the Trustee has been content in the past to leave these liability risks largely unhedged? Now that real and nominal interest rates are so low, is this really the right time to increase hedging of interest rate risks?

The key reasons for why we are proposing to increase liability hedging now relate to (i) the recent increase in the size of the Scheme relative to the size of the higher education (HE) sector and (ii) the challenging nature of the current investment outlook.

In relation to the first of these reasons, the size of the DB section of the Scheme has grown significantly in recent years relative to the aggregate size of the HE employers that support it.¹ In fact the DB section has grown 1.5 times faster than the HE sector (see Table 1). In other words, the covenant of the sponsoring employers is now supporting a much larger Scheme with a much larger risk exposure than it was in the past. As a result, it is necessary to consider the need for additional measures to mitigate risk, such as hedging.

Table 1. Evolution of the size of the DB section compared with the size of the HE sector for 2014, 2017 & 2020 valuations.

	2014 (bn)	2017 (bn)	2020 (bn)	Growth 2014-2017	Growth 2017-2020	Growth 2014-2020
1. Self-sufficiency liability (A proxy for the size of the DB section)	£56.1	£82.4	£102.0	50%	24%	85%
2. Net assets of HE sector (A proxy for the size of the HE sector) ¹	£40.2	£54.6	£63.5	36%	16%	58%
Ratio of growth (growth in SS liability / growth in net assets)				1.3x	1.5x	1.4x

¹ Net assets excludes pension liabilities. Source HESA data for HE sector, which excludes Oxbridge colleges.

We believe that this hedging is best directed at the interest rate and inflation risks associated with the liabilities for several reasons. Most importantly, these risks account for approximately two-thirds of the total financial risk to the deficit whereas the risks associated with growth assets account for only one-third.² Hedging the liability risks rather than the growth asset risks not only has a greater impact on overall risk reduction, but it also redresses the large imbalance between the different types of risks. In addition, we believe that the risks associated with growth assets are more reliably rewarded (via the so-called "equity risk premium") than these liability-related risks.

¹ This increase in the size of the Scheme relative to the size of the HE sector (and hence the size of the covenant) was also behind the need for additional covenant support in the 2020 Valuation.

² We use a "risk-decomposition" approach to determine the relative risks within the investment strategy. This is calculated by comparing the contributions of the different risks to the volatility of the self-sufficiency deficit (we have also performed this calculation on the TP deficit).

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Turning to the second of the reasons why we propose to increase hedging now, the current outlook for future investment returns is now much more challenging than it was at past valuations. As a result, there is a greater focus on downside risks. There are very plausible scenarios in which real interest rates could fall from current levels. (By “real interest rates” we mean interest rates after allowing for inflation. Interest rates could rise, but if they rose by less than the increase in inflation this would correspond to a fall in real interest rates).

Current UK interest rates are low by historical standards, and the UK real interest rate curve is likely further depressed by the well documented imbalance between supply and demand for index linked gilts (i.e., UK government bonds that give protection against inflation). These observations are reflected in our Base Case FBB expected return assumptions,³ which allow for an upward evolution of UK nominal and real interest rates over a 10-year period.

However, this assumption is subject to a wide margin of uncertainty and there are plausible scenarios in which such migration would not happen for an extended period. There remains a distinct possibility of further falls in UK real interest rates. A further downward move in real rates would put further pressure on the funding position relative to the size of the sector.

Q2. Why is ‘self-sufficiency’ used as the risk benchmark for the valuation? How has it impacted the VIS?

What exactly is self-sufficiency?

Self-sufficiency is defined as an approach for funding the DB section of the Scheme that corresponds to a confidence level of 95% (equivalent to a 5% failure rate) of being able to pay all benefits when they fall due without the need for any additional contributions, while maintaining a high funding ratio. More specifically, it corresponds to a combination of: (i) a level of assets and (ii) a low-risk investment strategy that achieves this objective.

For the 2020 valuation, we retained ‘self-sufficiency’ as our benchmark for risk, as it had been for the 2014, 2017 and 2018 valuations. This is consistent with guidance from TPR, and the view of the Joint Expert Panel (JEP) that it “is a useful concept ... it provides a reference point for judging whether a scheme is over-reliant on the sponsor covenant” (Joint Expert Panel report 1, page 8).

This decision was taken by the Trustee Board only after considerable internal review, discussions with stakeholders in the Valuation Methodology Discussion Forum (VMDF) and following consultation via the Discussion Document, March 2020 (pp. 21-22) and the Technical Provisions Consultation Document, August 2020 (pp. 18-21).

Why and how is it used as a risk benchmark?

The reason why we use self-sufficiency as a risk benchmark is simple: it is a low-risk strategy for funding the Scheme in the situation in which there were no employer covenant. Without a covenant, there would be no way to repair any shortfall that might arise in paying pensions (other than through investment returns) and as a result we would have to pursue low-risk self-sufficiency approach to reduce the probability of a future shortfall arising.

We must be clear that we do not target the self-sufficiency liability as the funding level and neither do we aim to pursue a low-risk self-sufficiency investment strategy. The funding level we target remains the Technical Provisions (TP) liability (which is a lower funding target than self-sufficiency) and the investment strategy assumed in the valuation is the VIS (which is a higher-risk investment strategy than self-sufficiency). The role of self-sufficiency as a risk benchmark is as follows: We monitor the “distance to self-

³ FBB refers to the Fundamental Building Blocks approach to developing expected investment returns used by USS Investment Management.

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sufficiency”, that is the gap between the level of assets and the self-sufficiency liability (i.e., the self-sufficiency deficit). This distance needs to be small enough such that it can be supported by the covenant. In other words, the employers need to have the risk capacity to bridge this gap in the unlikely event that it is necessary for them to do so. See the discussion in the TP consultation document, August 2020 and the Discussion Document, March 2020.

The importance of self-sufficiency in the valuation

Self-sufficiency plays a fundamental role in the valuation in relation to managing risk. This role is much broader and more fundamental than just managing investment risk. Self-sufficiency is a concept that helps the Trustee evaluate whether or not the employers have sufficient resources (risk capacity) to support the risk associated with running the DB section of the Scheme.

In order to ensure that there is a high probability of paying any financial obligation, the risks attached to that obligation must be consistent with the risk capacity of the organisation responsible for that obligation.

This is the case, for example, with banks and insurance companies, which under regulatory rules must explicitly set aside capital to support the risks associated with their businesses and ensure that there is a high degree of certainty of meeting their future financial obligations. Setting aside this capital demonstrates that these organisations have adequate risk capacity.

USS is not required to hold explicit capital for the Scheme in the same way as a bank or insurer. But by virtue of its covenant, USS has recourse to additional contributions from its sponsoring employers, which constitutes a form of such capital. We measure the amount of capital that employers are willing and able to provide in terms of the Affordable Risk Capacity (ARC), which is calculated as the present value of contributions of 10% of payroll over the next 30 years.

Self-sufficiency is how we check whether this capital (i.e., the ARC) is adequate to support the risks being taken within the Scheme. By comparing the self-sufficiency deficit to the ARC we can check that we are not taking too much risk and the capital is adequate.

Possible alternative approaches

We have explored the possibility of using alternative approaches to risk management that do not involve self-sufficiency, both with stakeholders and advisors during the 2020 valuation and other recent valuations. So far, no credible alternative has been found that plays the role described above as effectively.

For example, some stakeholders have suggested an alternative approach that ignores the self-sufficiency deficit and other solvency metrics, such as the TP deficit, and focuses primarily on cash flow. Specifically, this approach advocates focusing on meeting future benefit payments over time and ignoring the need to demonstrate solvency over time.

This alternative is however not acceptable to the Trustee. First, the management of DB pensions in the UK is regulated and the ability to demonstrate solvency is a key element of that regulation. (Note that other countries’ regulations also focus on solvency). Second, it is economically sensible to monitor the solvency position, as solvency: (i) makes it clear what the Scheme is relying on for funding (assets or the sponsor covenant, or a specific mixture of both) and (ii) provides a single-figure summary of the ability of the Scheme’s assets/investments to meet *all* of the future benefit payments. This is helpful in that it can provide an early warning of the potential for future difficulties in meeting these payments.

How has self-sufficiency impacted the choice of investment strategy?

Because of its important role as a risk benchmark for the Scheme, self-sufficiency must be reflected in the investment risk-return metrics used by the Trustee and hence the setting of investment strategy.

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Several, but by no means all, of the risk-return metrics considered by the Trustee in its analysis of investment strategy involved self-sufficiency. These metrics included the probability of the self-sufficiency deficit exceeding 150% of ARC, reverse stress tests on the self-sufficiency deficit and the worst-case self-sufficiency deficit at a 95% confidence. But because risk is multifaceted, we have used a broad set of different risk metrics, which includes other metrics not related to self-sufficiency, such as the probability of full funding of the TP deficit in 10 years' time and the volatility of contributions.

So, in arriving at its "in-principle" decision on the VIS, the Trustee evaluated different potential investment strategies in terms of this broad set of metrics, including some related to, and others unrelated to, self-sufficiency.

Q3. How have USS determined that allocations involving greater than 60% growth assets are outside of risk appetite, particularly as the allocation percentage has been at mid-60s in the recent past?

Under the 2018 valuation the Trustee was comfortable with an allocation to growth assets in the mid-60s for several reasons.

First, the mid-60s percentage allocation was a point in time measurement of a long-term de-risking "journey plan" over a 20-year period that was part of the 2018 valuation. The allocation at the mid-60s level was acceptable only because it was a point along that journey plan. Under the 2018 valuation, the journey plan envisaged an allocation to growth assets that was at (or about) 60% at the beginning of 2022 and fell thereafter.

Secondly, the Integrated Risk Management Framework (IRMF) for the 2018 valuation was very different from that for the 2020 valuation. The former involved a 20-year de-risking journey plan beginning in 2018 to a much lower growth allocation, which was based on what was called "Test 1". The latter is based on the dual discount rate (DDR) approach and involves no such prescriptive de-risking over the long term.

Thirdly, the 2018 valuation date was a time at which the size of the scheme relative to the size of the HE sector was smaller than it is to today. As a result, at that time the investment risk associated with allocation to growth assets in the mid-60s was smaller in relative terms compared with the risk capacity of the employers' covenant (see Q1 above).

Under the 2020 valuation, allocations to growth assets of higher than 60% are considered outside of risk appetite. This is because for these strategies:

- There is an unacceptably high risk that the self-sufficiency deficit could grow too large relative to the covenant. In particular, reverse stress tests and stochastic modelling lead to results for risk metrics that the Trustee regards as unacceptably large. For example:
 - Reverse stress tests show the self-sufficiency deficit could exceed 150% of the Affordable Risk Capacity (ARC).⁴
 - Stochastic modelling implies a relatively high probability of breaching 150% of ARC for the current portfolio.
- Other risk metrics are collectively at uncomfortable levels, including, for example, the level of collateral headroom and the value-at-risk (VaR).

⁴ This threshold of 150% of ARC corresponds to the present value (PV) of contributions of 15% of payroll over 30 years. The Trustee has determined that 150% of ARC represents an uppermost level of risk appetite, and expressed a desire for the investment strategy to minimise the likelihood of breaching this threshold.

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In terms of the reverse stress tests referred to above, these tests ask a simple question: How far does the market have to move for the self-sufficiency deficit to get too large? More specifically, how far does the market have to move for the self-sufficiency deficit to exceed 150% of the ARC? We considered this question in different ways:

- How far do growth assets have to fall?
- How far do real interest rates have to fall?
- How far do real interest rates have to fall if there is an accompanying fall in growth assets of say 30%?

When applying these tests to the Reference Portfolio at 31 March 2021⁵, the answers are:

- A 40% fall in growth assets; or
- A 1.4% fall in real gilt yields; or
- The combination of a 30% fall in equities and an 0.4% fall in real gilt yields.

These are all realistic scenarios. In terms of the reduction in real interest rates for example, there is a wide margin of uncertainty with respect to the future path of interest rates because of the continued imbalance in supply and demand of index-linked gilts and the uncertain nature of the post-COVID UK and global economies. The third scenario above (a 30% fall in equities combined with a 0.4% fall in real gilt yields) broadly characterises the behaviour of financial markets during the onset the COVID in the first half of 2020.

Q4. How did USS get comfortable with the potential reduced upside corresponding to the cost of hedging?

The Trustee got comfortable with the potential for reduced upside coming from hedging by considering the trade-offs between the various risk and return (and hence cost) metrics. In particular, as we explain in the below example, this cost is only realised in scenarios in which real interest rates rise (for example in the scenario in which FBB expected returns are realised) and in those scenarios the funding level of the Scheme would be much higher than at the valuation date. This increase in the funding level when the cost of hedging is highest was important for the Trustee to get comfortable with the level of hedging. This is illustrated numerically in the example below.

By contrast, in scenarios in which real interest rates fall, additional hedging would actually generate a profit. In this case, the fall in the funding level would be more limited because of benefits from the liability hedging that had been undertaken.

Example

This is illustrated in Table 2 in which we see that liability hedging protects the funding level if real interest rates were to fall by 100 bp (or 1 percentage point). In this scenario, hedging gives rise to a smaller increase in the self-sufficiency deficit than is the case without hedging (an increase of only £16.2bn instead of £27.0bn). This is because the LDI assets that constitute the hedge make a profit in this scenario.

Compare this to what happens in the opposite scenario in which real interest rates rise. In this scenario, there is a significant improvement in the funding level (i.e., a reduction in the deficit of £13.2bn), but the improvement is even greater for the unhedged strategy (£22.0bn). This is because in this scenario the LDI assets that constitute the hedge make a loss, but this loss is more than offset by the fall in the liability since the liability hedge ratio in the VIS is only 40%. (Note that the current hedge ratio is 28% for inflation risk and 34% for interest rate risk).

⁵ The 31 March 2021 Reference Portfolio composition modelled in the ALM Framework corresponds to 60% Growth assets and 25% credit assets, with hedge ratios of 30% for liability-related interest rate and inflation risks.

Instead of focusing purely on the cost, which is only realised in certain scenarios, we should really focus on the range of possible out-turns, and not on the “central” or expected outcome alone. The hedged strategy offers better protection in downside scenarios than other strategies that have similar return expectations (for instance a strategy with fewer growth assets and lower hedge ratios), but still offers the potential for improvements in the funding level in upside scenarios.

Table 2. Illustration of the impact of hedging on the self-sufficiency (SS) deficit under scenarios of rising and falling real interest rates at the 2020 valuation date.

Scenario	Impact ¹	Unhedged VIS (0% Hedge Ratio) £bn	Hedged VIS (40% hedge Ratio) £bn
Real gilt yields <i>rise</i> by 100 bp	Change in assets	0.0	-8.8
	Change in SS liability	-22.0	-22.0
	Change in SS deficit²	-22.0	-13.2
Real gilt yields <i>fall</i> by 100 bp	Change in assets	0.0	+10.8
	Change in SS liability	+27.0	+27.0
	Change in SS deficit²	+27.0	+16.20

¹ Impact corresponds to an instantaneous parallel shift in the real gilt curve and is applied to LDI assets only (i.e., assumes that all else is equal).

² A negative number for the change in the deficit means that the deficit falls, thereby improving the funding position. A positive number for the change in the deficit means that the deficit grows, and the funding position is worse.

Q5. How does USS manage leverage? Should we be concerned about the risks of leverage associated with the proposed strategy? How did USS evaluate the ‘tail risk’ of leverage? Can USS explain the associated cost of leverage?

Definitions of leverage and collateral

Leverage is economically equivalent to a collateralised (i.e. secured) form of ‘borrowing’ within the investment portfolio. It is implemented via a variety of different financial instruments (e.g., inflation swaps, total return swaps, exchange-traded futures and repurchase agreements), with the aim of improving the efficiency of portfolio management. Leverage involves posting and receiving collateral to protect both the provider of leverage and the Scheme in the event of a default of either counterparty.

Collateral is an asset that is pledged as security against outstanding debt or other financial obligation that the lender has the right to seize if the borrower defaults on the obligation.

Managing leverage and the risks of leverage

As we have explained in the webinars on the VIS, the leverage used in the Scheme brings greater efficiency to risk management and capital management. Managing leverage involves managing cash, managing collateral and managing counterparties, along with the associated risks. USS Investment Management is very experienced in managing these.

In terms of managing cash, USS Investment Management takes a conservative approach because the impact of not having sufficient cash is highly undesirable. This approach involves a daily cash forecasting process of cash inflows (e.g., from contributions, investment income and investment redemptions) and cash outflows (e.g., from benefit payments, new investments and cash collateral posting) over a six-month horizon. We then stress the cash requirements by considering what have been the worst historic moves in market levels over a two-week horizon and hold enough cash to meet these. This is repeated every business day.

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Managing collateral involves planning to ensure that sufficient collateral (typically in the form of cash and gilts/government bonds) is available when it is required.

The process used involves, first, determining the collateral requirements corresponding to the worst possible market movements observed over a three-month horizon as well as those that have occurred over a 12-month horizon. The second step is to then ensure that sufficient collateral will be available over these horizons to meet these worst possible requirements. This approach takes an historical approach to determining the worst case, rather than a stochastic approach, because the stochastic approach generally does not adequately capture the probability of such extreme outcomes. (In reality, extreme events in the tails of the distribution of outcomes are more probable than the estimations coming from most stochastic models, and these are better captured by using historical data directly.)

Managing counterparty risk involves several elements: first, picking only high-quality counterparties and, second, diversifying over a number of different counterparties. Thirdly, we use collateralisation where possible to limit the impact of counterparty default, should it occur. (An example of where we cannot use collateralisation is in the bank account that we use to pay pensions each month. The cash in the account is exposed to counterparty default risk).

USS Investment Management analyses how much the Scheme could lose from counterparty defaults over a five-day period, which is a period of time over which collateral might not be adequately updated due to operational reasons. This approach is similar to that of investment banks and asset managers.

The tail risk of leverage

USS Investment Management evaluates the tail risk of leverage overall by looking at the worst possible 12-month market movements over the past 70 years.

The cost of leverage

The cost of leverage is low because the “borrowing” takes place via financial instruments that are collateralised. USS is able to fund in US dollars and Euros as well as sterling and leverage can be achieved in both equity and bond markets, and in the currency that is cheapest at the time. Furthermore, we have government bonds in the investment portfolio that are available as collateral when needed, which enables USS to keep the cost of leverage low.

Q6. Why does a Hedge Ratio of 40% correspond to an allocation to LDI of 52% in the VIS?

Note that these two quantities have different denominators. The allocation to LDI is defined as the value of LDI hedging assets as a percentage of total asset value. By contrast the Hedge Ratio is defined as the value of hedging assets (adjusted for interest rate and inflation risk sensitivity) as a percentage of the self-sufficiency liability.⁶ Because the liabilities are greater than the value of the assets, it follows that the allocation to LDI will be greater than the Hedge Ratio.

It should also be noted that as the funding level improves over time, the leverage required to maintain a 40% hedge ratio will fall.

⁶ Note also that the adjustment of the value of hedging assets for interest rate and inflation risk sensitivity in the numerator of Hedge Ratio is an adjustment of the so-called “duration” of the hedges relative to the “duration” of the liability.

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Q7. How does the actual portfolio allocation to growth assets compare with the 60% allocation in the VIS?

The allocation to growth assets (including equities and real assets) on both 30 September 2021 and on 31 December 2021 was 61%.

Q8. Does the “in-principle” decision on the VIS change the funding basis used in the valuation?

No, neither the funding basis of the valuation nor its outputs (in particular the TP liability, contribution rates or recovery plan) are impacted by the Trustee’s “in-principle” decision on the VIS.

Q9. Does the allocation to growth assets of 60% change as the leverage of the Scheme changes? Should we measure growth assets as a percentage of gross assets (i.e., assets grossed up for leverage)?

No. The risk to the DB Section of the Scheme from growth assets is a function of the size of the allocation to growth assets in monetary terms (£billions). The allocation to growth assets in the VIS is expressed as a percentage of the (net) assets of the Scheme. If the allocation to growth assets were to be increased pro-rata relative to the level of gross assets, this would give rise to even more risk in the Scheme. Consider the following example:

Suppose the level of (net) assets of the DB Section is c. £90bn, then for the VIS the level of gross assets would be £123bn (based on 37% leverage). Consider a 30% fall in price of growth assets:

- If the growth asset allocation was 60% of net assets then this corresponds to £54bn, which under a 30% fall in price, would decrease in value by £16bn. So, the deficit would grow by £16bn.
- If the growth asset allocation was 60% of gross assets then this corresponds to £74bn, which under a 30% fall in price, would decrease in value by £22bn. So, the deficit would grow by £22bn.