A detailed view of the Defined Benefit Investment Strategy for the 2020 valuation

A presentation for sponsoring employers

28 February 2022

Welcome

- **Presenters**
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- **Housekeeping**
  - Please ensure your camera and microphone are off
  - Please post any questions you have in the chat or by emailing SIPConsultation@uss.co.uk – we will come to these at the end of the presentation
  - This meeting is being recorded
  - The recording will available for all employers to watch after the event
  - A fuller version of the slide deck will also be available after the event

This presentation is a supplementary technical presentation on the Valuation Investment Strategy that build on the overview presentation presented at earlier webinars.

Agenda

1. **Introduction**
2. The Valuation Investment Strategy (VIS)
3. The hedging component
4. The leverage component
5. Evaluation of risk and return

Introduction

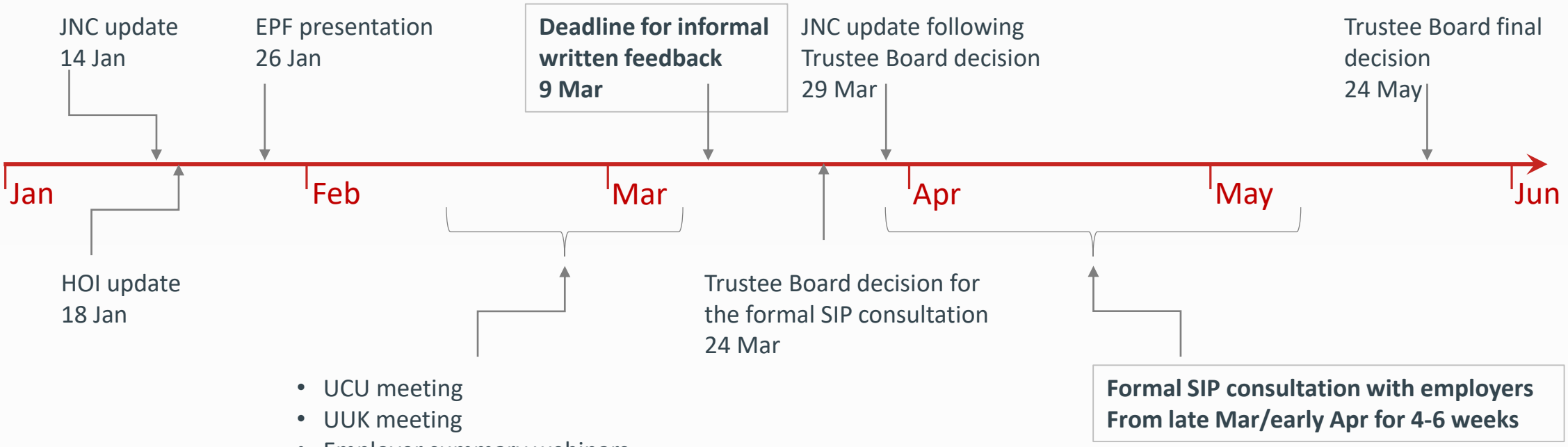
- **Objectives of this presentation**
  - This presentation builds on the previous overview presentation and provides more technical details
  - Specifically the objectives are:
    i. To improve employers understanding of the **VIS** within the construct of the 2020 valuation
    ii. To help employers prepare for the **formal consultation on the SIP**
    iii. To provide you with a basis for **further reflection, questions and informal feedback**

- **The Trustee's "in-principle" decision on the valuation investment strategy (VIS)**
  - The VIS **(a) maintains the level of growth assets, (b) adds additional liability hedging by (c) increasing leverage**
  - This decision is based on 15 months of work by the ALM/Investment Strategy working group, with the involvement of the Trustee Board and the Investment Committee
  - This decision reflects:
    - Comprehensive, holistic **analysis** of the investment strategy **in the context of the IRMF**
    - The i**mpact of (i) benefit change and (ii) additional covenant support**
    - Consideration of **stakeholders' views** that the level of growth assets should **not** be reduced
    - Advice from **external advisors** (LCP, Mercer and PwC), who have been closely involved throughout the process
    - The outcome of comprehensive **discussions and workshops with the Trustee Board** to calibrate risk appetite

  - **This decision will be reviewed** following the formal Consultation on the SIP

Reminder of the process for finalising investment strategy

- There are two opportunities to provide feedback



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Reminder of the proposed VIS

- **The Valuation Investment Strategy:**
  - Is aligned with the valuation methodology/assumptions & Trustee risk appetite
  - Is similar to the current Reference Portfolio in formulation/composition
  - Helps guide the development of the implemented investment portfolio, but is not the implemented portfolio

Three key components of the VIS

- **Growth: Maintains a high allocation to growth assets over time**
  - The proposed VIS maintains the current allocation to **growth assets of c. 60%**
  - The proposed VIS would maintain a **higher allocation to growth assets over time than under the 2018 valuation**, which involved a progressive reduction in the allocation to growth assets of c. 7.5% every three years

- **Hedging: Has increased hedging of liability-related risks (inflation risk and interest rate risk)**
  - The additional hedging **reduces the total risk** (relative to the liabilities) and **reduces the imbalance between different risks**
  - **The hedge ratio** (essentially the value of hedging assets as a percentage of the self-sufficiency liability) **has increased from 34% for interest rate risk / 28% for inflation risk** (at 30 September 2021) **to 40% for both**

- **Leverage: Has increased leverage**
  - The additional leverage allows increased liability hedging **without** reducing the allocation to growth assets

The asset allocation for the proposed VIS

Asset Allocation for the VIS

	Current[1]	VIS
Growth	61%	**60%**
Credit	21%	**25%**
LDI (Hedging)	35%	**52%**
Leverage	–17%	**–37%**

[1] Current allocation is as of 30 September 2021.

Breakdown of Growth and Credit for the VIS

Component	Asset class	Sub-asset class breakdown
Growth	90% Equity	20% UK Equity 65% Developed Market ex UK 15% Emerging Market
	10% Property	100% Property
Credit	100% Other Fixed Income	15% Emerging Market Debt 40% UK Credit 20% Global Credit 10% Global High Yield 15% US TIPS

The proposed VIS reflects an appropriate balance of risks and expected return;
It is consistent with the IRMF and the Trustee's risk appetite

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Hedging more liability-related risks helps us to better manage the overall level of risk

- **The current investment strategy has an unacceptable risk profile**
  - In addition to the **total risk being beyond risk appetite**, the **profile of different risks is unbalanced**
    - Around 2/3 of the total risk in the Self-Sufficiency Deficit is driven by liability-related risks (interest rate and inflation risks) and around only 1/3 is driven by growth assets
- **There are benefits from hedging more liability-related interest rate and inflation risks**
  - The additional hedging **reduces the total risk** (relative to liabilities) and **reduces the imbalance between the risks**
  - Growth asset risks are more likely to be rewarded over the long term
  - We don't have to give up hope of higher returns from growth assets simply because we want to hedge liability risks
    - Instead of selling growth assets, we can use **leverage** to purchase liability hedges. We conclude that this is the most appropriate way to manage the "cost" of hedging, and that this approach retains exposure to potentially higher returns
    - The risks associated with leverage have been analysed by USSIM and are comfortably within risk appetite
- **Note:**
  - **Hedging does not remove all the liability-related risks**, but it does reduce them.
  - **There remain significant unhedged risks:**
    - 60% of the accrued Self-Sufficiency liability is unhedged
    - 100% of the future service liability is unhedged
  - **Hedging can involve a cost** which depends on the chosen reference point and the view on expected returns

What could be the return impact of more hedging?

- **The return impact of more liability hedging depends on potential changes to UK real interest rates**
  - All else equal, if UK real interest rates:
    - ***FALL***, **the extra hedging would be 'profitable'**, but **the funding level would deteriorate** and **future service costs rise**
    - ***RISE***, **the extra hedging would not be 'profitable'**, but **the funding level would improve** and **future service costs fall**

- **The cost of hedging depends on the scenario that plays out.**
- Consider an instantaneous c.10% increase to the Hedge Ratio:
  - Under ***market-consistent projections***, the cost of the additional hedging is 0
  - Under ***FBB Base Case assumptions***, UK real interest rates ***rise*** by c. 2% over 10 years. The increased hedging ***reduces the expected return*** by c. 0.25% p.a. But the funding level would **improve**
  - Under the ***opposite assumption,*** UK real interest rates ***rise*** by c. 2% over 10 years. The increased hedging ***increases the expected return*** by c. 0.25% p.a. The funding level still **deteriorates,** but **by less** than without hedging

- **Note:** under the 2018 valuation the current Reference Portfolio is on a de-risking journey, and its Hedge Ratio is due to reach 40% in 2025 and with lower exposure to growth assets than the VIS

Illustration of the impact of hedging

- **At the valuation date:**
  - Assets (invested in the VIS) £66.5 bn
  - Self-sufficiency (SS) liability £102.0 bn
  - **SS Deficit** **£35.5 bn**

What is the impact of changes in real gilt yields?

- *Real gilt yields **rise** by 100 bp ↑ ?*
- *Real gilt yields **fall** by 100 bp ↓ ?*

	Unhedged (0% Hedge Ratio)		Hedged (40% Hedge Ratio)	
	Change in:		*Change in:*	
*Real gilt yields **rise** by 100 bp* ↑	Assets	£0.0 bn	Assets	–£8.8 bn
	SS liability	–£22.0 bn	SS liability	–£22.0 bn
	SS Deficit	**–£22.0 bn**	**SS Deficit**	**–£13.2 bn**
*Real gilt yields **fall** by 100 bp* ↓	Assets	£0.0 bn	Assets	+£10.8 bn
	SS liability	+£27.0 bn	SS liability	+£27.0 bn
	SS Deficit	**+£27.0 bn**	**SS Deficit**	**+£16.2 bn**

Impact is applied instantaneously and applied to "LDI" allocation only, with the 40% interest rate and inflation Hedge Ratios implemented across the portfolio (i.e., "all else equal")
Duration and Convexity assumptions are approximate, and are applied equally to the Assets and Self Sufficiency Liability

Why are we proposing to hedge more now?

The following 3 key points underpin our decision to increase the hedge ratio at this point in time

1. **Size of Scheme vs the Higher Education Sector**
   - The **size of the Scheme has continued to grow relative to the size of the Sector.** So the risks have become more meaningful in relation to the risk capacity of the sector
   - Increasing the Hedge Ratios helps to better align investment strategy with the Sector's risk capacity and the Trustee's risk appetite

2. **The current level and possible future path of 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 supply and demand imbalance
   - These observations are reflected in our Base Case FBB expected return assumptions, which allow for an upward migration 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. As a result, **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

3. **Implementation Factors**
   - It will take time to build up the scheme's hedge ratio to that in the VIS given the available supply of UK Index Linked Gilts. We plan therefore to build up the hedge ratio over time, taking advantage of periods of heightened supply and attractive pricing points
   - The move to a 40% Hedge Ratio represents an increase of 6% in rates and 12% in inflation as of 30/09/2021. This is a relatively modest increase, and indeed was already factored into the Reference Portfolio journey plan over the coming years

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Leverage is an important tool in investment management

- **What do we mean by leverage and collateral?**
  - Leverage effectively involves a **collateralised form of "borrowing"** using different financial instruments, such as repurchase agreements (repos), swaps, futures and other derivatives
  - We "post" and "receive" collateral when managing leverage. This protects both the lender and the Scheme in the event of default. Different types of assets are accepted as collateral depending on the form of leverage
  - The amount of collateral posted is a function of the level of leverage, the associated risk, and the unrealised profit/loss
  - We therefore have to closely control our ability to manage collateral when considering the level of supportable leverage

- **What is the purpose of leverage?**
  - The primary purpose of leverage is to **facilitate efficient risk management** and **efficient capital deployment**
  - Leverage is an important building block of the USS investment strategy and has been for many years. Other large UK schemes have had leverage in the range 100%-200%
  - It permits management of liability hedges without necessarily adjusting growth assets[1] to allow scope for higher risk-adjusted returns
  - The increased leverage in the VIS reduces the impact of adverse changes in interest rates and inflation on the funding position and allows us to maintain a similar expected return

- **How does Leverage interact with the wider portfolio?**
  - All else being equal, the higher the allocation to growth assets, the higher the leverage required to support the same hedge ratio
  - The level of supportable leverage is constrained by collateral requirements and operational/regulatory limits (see next page)
  - This is, in part, why allocations to growth assets higher than 60% are **not** consistent with the Trustee's risk appetite

[1] *Prevailing funding costs are a key determinant with respect to the source of capital for the purposes of hedge management.*

Leverage is an important tool in investment management

- **Leverage improves asset-liability risk management, but introduces other risks**
  - Because of the requirement to post collateral and the risks associated with leverage, it needs to be monitored and managed carefully
  - Some of our leverage controls include:
    - **Leverage monitor** – are we staying within allowed bands?
    - **Liquidity monitor** – could we run out cash?
    - **Counterparty risk monitor** – are we diversifying across counterparties? Is counterparty creditworthiness acceptable? Is the counterparty exposure within the specified limits?
    - **Limits on repo processes** – reduce risk associated with rolling repos
    - **Stress testing collateral demand** – could we run out of collateral?

USS leverage (December 31st 2021)	
Source of Leverage[1]	Amount in £
Bond and Equity Swaps/Futures	£9.7bn
Repo/Gilt TRS	£4.8bn
Interest Rate & Inflation Swaps	£8.5bn
Commodity Swaps	£630m
Cash assets (negative leverage)	-£1.8bn
Total (net of cash assets)	**£21.2bn** (23.0%)

[1] *Prevailing funding costs are a key determinant with respect to the source of capital for the purposes of hedge ratio management.*

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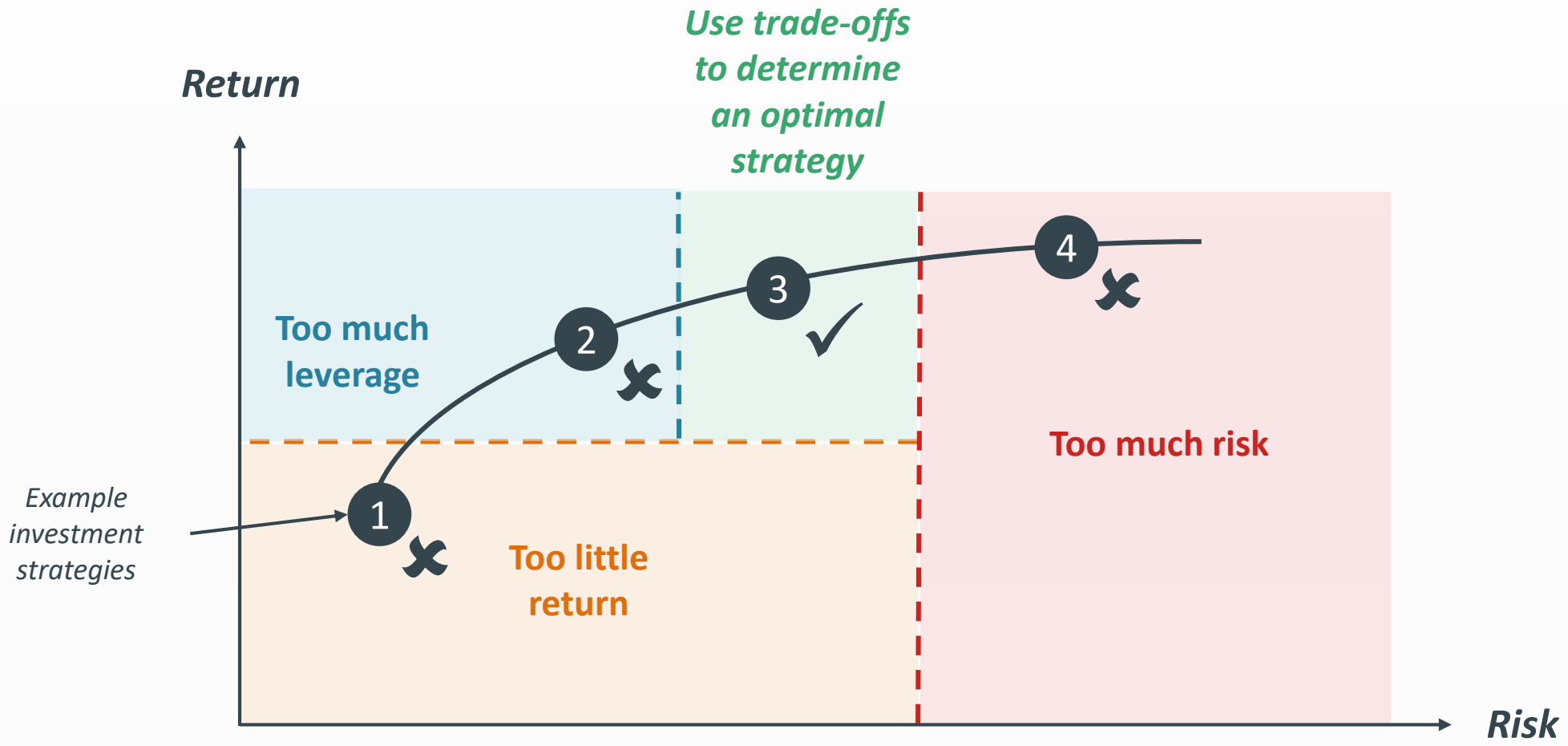
The investment strategy recommendation reflects a *trade-off* between risk and expected return in the acceptable range



Filter strategies that either: use too much leverage, take too much risk, or generate too little return

Choosing between candidate strategies involves a risk-return trade-off for different combinations of growth and hedging assets

Greater protection *against falling interest rates and rising inflation, but a* ***drag on returns*** *if rates rise*

Hedging assets

1
- **Greater stability** in deficit, but **less** potential to repair it quickly
- **Lower risks** from:
  - Falling interest rates
  - Rising inflation
  - Growth asset volatility

2
- **Moderate stability** in deficit, but **more** potential to repair it quickly
- **Offsetting of risks**:
  - Lower interest rate & inflation risk
  - Higher growth asset volatility

3
- **Moderate stability** in deficit, but **less** potential to repair it quickly
- **Offsetting of risks**:
  - Higher interest rate & inflation risk
  - Lower growth asset volatility

4
- **Lower stability** in deficit, but **more** potential to repair it quickly
- **Higher risks** from:
  - Falling interest rates
  - Rising inflation
  - Growth asset volatility

Higher expected returns, *but greater* ***volatility***

Growth assets

We started with a wide range of candidate investment strategies and evaluated their suitability in terms of key risk-return metrics

- A wide range of strategies were evaluated for their consistency with risk appetite, expected return and ease of implementation

The range of investment strategies considered

- **Growth asset allocations** (% of assets)
  - 40% - 65%
- **Liability hedge ratios** (% of self-sufficiency)
  - 25% - 55%
- **Leverage**
  - <2.5x gearing relative to the LDI allocation

Risk Based Measures

- (SS) deficit vs affordable risk capacity (ARC)
- Probability of self-sufficiency deficit exceeding 150% of ARC
- SS deficit

Return Based Measures

- Time for Metric B to turn Green
- Probability of TP full funding
- Probability of DRCs > 10% in 6 years

The Risk/Return Trade Off

Implementation Measures

- Time to Implement with various strategies
- Collateral Headroom in relation to leverage

Reverse Stress Tests

- Ability to withstand further falls in interest rates and increased breakeven inflation
- Ability to withstand a "COVID"-type market event

More detailed analysis was applied to a smaller set of more favourable strategies

Examples of candidate investment strategies

Lower growth, more hedging

	Candidate 1 ***Current** (30 Sep-21)*[1]	Candidate 2 ***Proposed VIS***	Candidate 3	Candidate 4
Growth assets: **Int. rate hedge:** **Inflation hedge:**	61% Growth 34% HR[2] 28% HR[2]	60% Growth 40% HR 40% HR	55% Growth 45% HR 45% HR	45% Growth 50% HR 50% HR
Risk Appetite Position (Mar 2021)	Outside (➔reverse stress tests on interest rate & inflation are outside appetite)	Within – just (➔collateral headroom and reverse stress test results are near the threshold)	Within – by a margin	Within – comfortably But challenged on path to full funding
	• Interest rate & inflation risks disproportionately large relative to growth assets risk • This candidate is <u>not</u> considered further	• At Sep 2021 within risk appetite by a margin • Improves balance between interest rate/inflation risk relative to candidate 1 • Hedging is close to maximum for this growth allocation	• At Sep 2021 within risk appetite by a bigger margin • Reduction in probability of full funding • Inflation hedging not achievable by next valuation	• At Sep 2021 even more comfortably within risk appetite • But still challenged on path to full funding • Inflation hedging will take two valuation cycles

[1] *The current portfolio composition modelled in the ALM Framework corresponds to 60% Growth, 25% Credit, 30% inflation HR and 30% Rates HR.*

[2] *The hedge ratios (HR) for the current portfolio are determined based on a beta of 1 for TIPS.*

Affordable Risk Capacity (ARC) vs the Self-Sufficiency (SS) deficit

- **Affordable Risk Capacity (ARC)**
  - **Significance:**

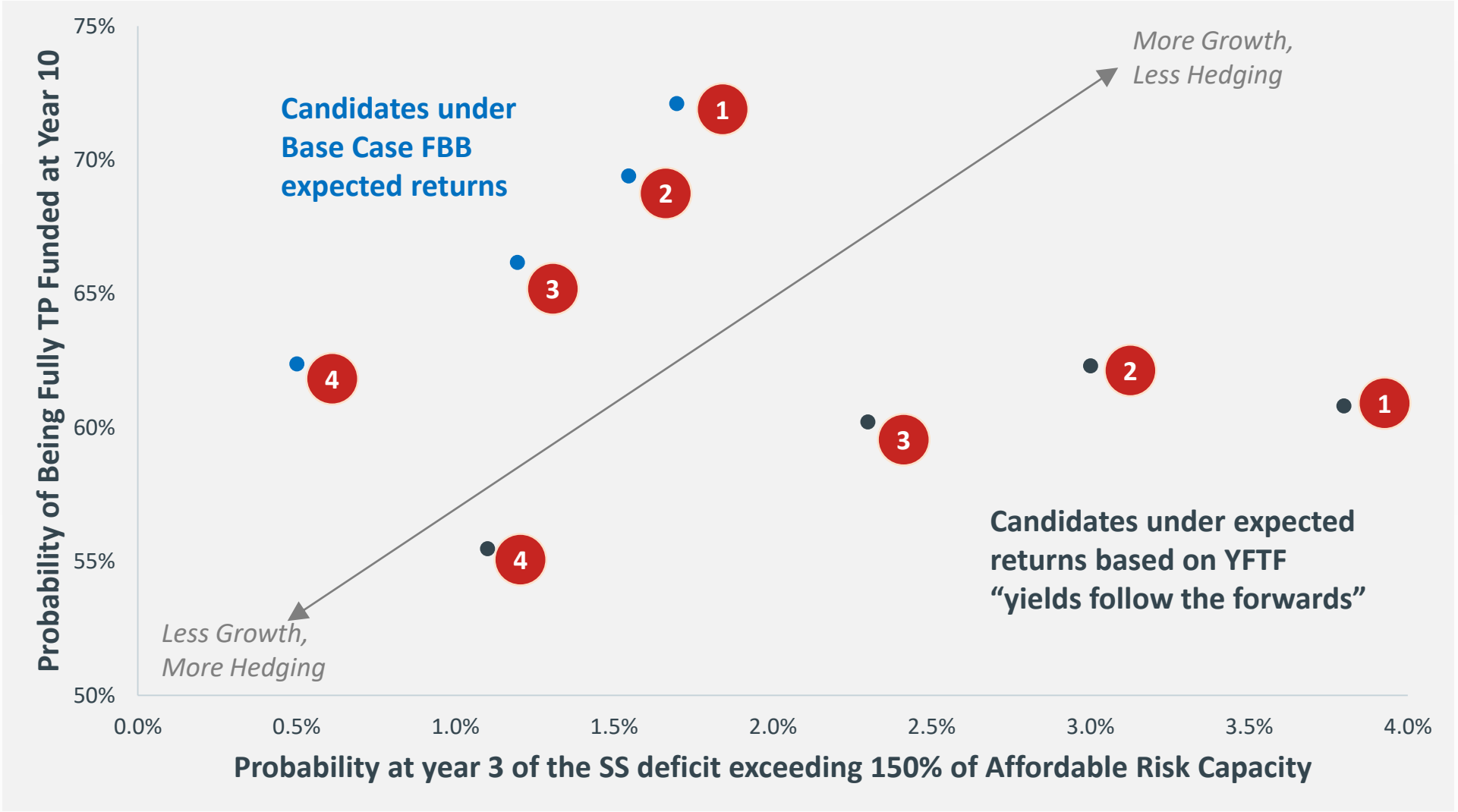
    ARC is one measure of the covenant: It reflects the ability of employers to support the Scheme in adverse conditions
  - **Definition:**

    ARC represents the amount that employers could sustainably afford to pay over an extended period to repair the deficit in an adverse scenario. It corresponds to the present value (PV) of contributions of 10% of payroll over 30 years

- **Comparing the Self-Sufficiency (SS) deficit to ARC:**
  - The Trustee would be concerned should the SS deficit grow to be very much larger than the ARC.
  - For example, if the SS deficit were to exceed 150% of ARC, then the Trustee would concerned that the employers capacity to support the Scheme was diminished
  - 150% of ARC corresponds to the present value (PV) of contributions of 15% of payroll over 30 years
  - This is an important threshold for the SS deficit that is used in the investment risk metrics

150% of Affordable Risk Capacity is an important risk threshold for the Self-Sufficiency Deficit

A perspective on the risk-return trade off – as at 31 March 2021
(for different expected return assumptions)



1 Current position 60% growth, c. 30% HR

2 60% growth, 40% HR

3 55% growth, 45% HR

4 45% growth, 50% HR

Note that this is not an "efficient frontier" chart, but merely a chart illustrating risk vs return for selected portfolios

Reverse stress tests ask the following question:
"How far does the market have to move for the SS deficit to get too large?"

- **Reverse stress tests** were performed on the **self-sufficiency deficit**
  - How far does the market have to move for the SS deficit to **exceed 150% of Affordable Risk Capacity** (ARC)
  - This threshold corresponds to **the present value (PV) of contributions of 15% of payroll over 30 years**

- The Trustee 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.

- **The key reverse stress tests are as follows:**
  - For the SS deficit to exceed 150% of Affordable Risk Capacity (ARC)
    - 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 20% or 30%?

Example of reverse stress tests

- **The following market moves would cause the SS deficit to exceed 150% of ARC** *(for the Current Portfolio)*:
  - 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 scenarios might arise in the following situations (amongst others):**

  a) 1.4% fall in real rates:

  - While we recognise that UK interest rates are low by historical standards and that the UK real curve in particular is likely further depressed by the well-documented supply and demand imbalance, there is a wide margin of uncertainty with respect to the future path of interest rates
  - This view is based on: a continued supply/demand imbalance; the highly uncertain trajectory of the post COVID UK and global economy; and the possibility of structural regime changes. As a result, **there remains a distinct possibility of further falls in UK real interest rates**, for example in scenarios where inflation is structurally higher while real rates are depressed by financial repression

  b) 30% fall in equities plus 0.4% fall in real rates:

  - This scenario broadly characterises the behaviour of financial markets during the onset the COVID in the first half of 2020

Reverse stress test results:
"How far does the market have to move for the SS deficit to exceed 150% of ARC?"

31 March 2021			Market move for SS deficit to exceed 150% of Affordable Risk Capacity (ARC)			
Candidate Strategy	**Growth Assets**	**Hedge Ratio**	**Reverse stress of growth assets only**	**Reverse stress of real rates only**	**Reverse stress of real rates with -20% growth shock**	**Reverse stress of real rates with -30% growth shock**
1 = Current	60.0%	c. 30%	-40.1%	**-1.4%**	-0.8%	**-0.4%**
2	60.0%	40%	-40.1%	**-1.7%**	-1.0%	**-0.6%**
3	55.0%	45%	-43.7%	**-1.9%**	-1.2%	**-0.8%**

Note these stresses are approximate and do not fully capture second-order effects, in particular for significantly higher (>2%) moves in real rates.

- The current strategy (Candidate 1) cannot sustain a COVID-like shock (final column) and remain within 150% of ARC
- Progressive increases in hedge ratio increase the tolerance to such extreme shocks
  - Moving from Candidate 1 to 2 improves the tolerance of an outright real rate move by c. 30bp (a 21% increase in resilience)
  - Candidate 3 shows the greatest improvement in tolerance, but this must be seen in the context of reduced upside potential

Summary risk-return statistics for Candidates 1 to 3

	31 Mar 2021	Growth Assets	Hedge Ratio	Time to implement – ILGs only (yrs)	Time to implement – TIPS & ILGs (yrs)	Collateral headroom (bps)	VaR multiple headroom	Prob of TP full funding in 10 years	Prob Metric B red in year 3	Prob of SS deficit > 150% ARC year 3 [1]	95% confidence SS deficit as a % of payroll in year 3	Reverse stress of real rates[2]	Reverse stress of real rates with -30% growth shock[2]
1	**Base case FBB**	60%	c. 30%	0.6	0.2	180	1.2x	72%	17%	1.7%	13%	-1.4%	-0.4%
	YFTF	60%	c. 30%	0.6	0.2	180	1.1x	61%	27%	3.8%	14%	-1.4%	-0.4%
2	**Base case FBB**	60%	40%	3.2	2.8	135	1.4x	69%	17%	1.6%	13%	-1.7%	-0.6%
	YFTF	60%	40%	3.2	2.8	135	1.3x	62%	25%	3.0%	14%	-1.7%	-0.6%
3	**Base case FBB**	55%	45%	4.5	4.1	157	1.6x	66%	18%	1.2%	13%	-1.9%	-0.8%
	YFTF	55%	45%	4.5	4.1	157	1.5x	60%	25%	2.3%	14%	-1.9%	-0.8%

- Moving from the **Current Strategy (Candidate 1) to Candidate 2 improves risk statistics**. This is evidenced by the probability of the self-sufficiency deficit breaching 150% of ARC falling from c.4% to c. 3% under YFTF, and the outright real rate stress tolerance improving by c. 30bp
- However the **increased hedge ratio leads to a fall in collateral headroom**, and indeed takes it slightly below 140bp. In practice, USSIM believes this is manageable via the additional tools it has available within the Implemented Portfolio
- Whilst the move to **Candidate 3 provides more collateral headroom**, this portfolio exhibits l**ess favourable expected return** statistics
  - (e.g. the probability of TP full funding under Base Case FBB falls from 72% to 66%)

[1] 150% of ARC (Affordable Risk Capacity) corresponds to the present value of contributions of 15% of payroll over 30 years.
[2] These reverse stress tests are based on the self-sufficiency deficit exceeding 150% of Affordable Risk Capacity (= PV of 15% of payroll over 30 years)

Risk-return characteristics of candidate strategies based on FBB returns

(FBB expected returns as of 31 March 2021)

Valuation Investment Strategy	Candidate 2	Candidate 3
Asset Allocation	60% Growth, 25% Credit, 52% LDI (25% Funded LDI & 27% Levered LDI)	55% Growth, 25% Credit, 59% LDI (30% Funded LDI & 29% Levered LDI)
Interest Rate & Inflation Hedge Ratios (% of SS liability)	40%	45%
Expected Return[1]	Liability Proxy + 3.8%	Liability Proxy + 3.5%
Required Return (to outperform liabilities)[2]	Liability Proxy + 2.4%	Liability Proxy + 2.4%
Risk-return Metrics		
• *Probability of being fully funded on a TP basis in 10 years*	*69%*	*66%*
• *Time to green for Metric B*	*2 years*	*2 years*
• *95th percentile of SS deficit as a % of payroll in year 3*	*13%*	*13%*
• *Probability of SS deficit exceeding 150% of ARC*[3] *in 3 years*	*1.6%*	*1.2%*
• *Reverse real rate stress for 150% of ARC*[3] *with -30% growth stress*	*-0.6%*	*-0.9%*
• *Asset-Liability volatility (scaled)*	*11.4%*	*10.2%*

[1] *The "Expected Return" is the best estimate return on the investment strategy. It is an ex-ante measure. Nominal returns based on 30-year **FBB Base Case expected returns**, expressed as return over liability proxy. Assumes 0.6% of rebalancing premium which corresponds to that for the Reference Portfolio as at March 2021.*

[2] *The "Required Return" is defined as the prudent return on the portfolio of liability cashflows + required outperformance. For the valuation to deliver its objective of full TP funding, the strategy should deliver or beat this required return. It is an ex-post measure. represents the indicative minimum return required from 31/03/2021 to remain on course with the Recovery Plan and with the cost of future service. This is consistent with he updated valuation assumptions as at 31 March 2021.*

[3] *ARC is Affordable Risk Capacity, so 150% of ARC corresponds to the present value of contributions of 15% of payroll over 30 years.*

Risk-return characteristics based on different expected returns
("Yields Follow The Forwards" or "YFTF" as of 31 March 2021)

Valuation Investment Strategy	Candidate 2	Candidate 3
Asset Allocation	60% Growth, 25% Credit, 52% LDI (25% Funded LDI & 27% Levered LDI)	55% Growth, 25% Credit, 59% LDI (30% Funded LDI & 29% Levered LDI)
Interest Rate & Inflation Hedge Ratios (% of SS liability)	40%	45%
Expected Return[1]	Liability Proxy + 3.8%	Liability Proxy + 3.5%
Required Return (to outperform liabilities)[2]	Liability Proxy + 2.4%	Liability Proxy + 2.4%
Risk-return Metrics		
• *Probability of being fully funded on a TP basis in 10 years*	*62%*	*60%*
• *Time to green for Metric B*	*2 years*	*2 years*
• *95th percentile of SS deficit as a % of payroll in year 3*	*14%*	*14%*
• *Probability of SS deficit exceeding 150% of ARC*[3] *in 3 years*	*3.0%*	*2.3%*
• *Reverse real rate stress for 150% of ARC*[3] *with -30% growth stress*	*-0.6%*	*-0.9%*
• *Asset-Liability volatility (scaled)*	*11.4%*	*10.2%*

[1] *The "Expected Return" is the best estimate return on the investment strategy. It is an ex-ante measure. Nominal returns based on 30-year **YFTF expected returns**, expressed as return over liability proxy. Assumes 0.6% of rebalancing premium which corresponds to that for the Reference Portfolio as at March 2021.*

[2] *The "Required Return" is defined as the prudent return on the portfolio of liability cashflows + required outperformance. For the valuation to deliver its objective of full TP funding, the strategy should deliver or beat this required return. It is an ex-post measure. represents the indicative minimum return required from 31/03/2021 to remain on course with the Recovery Plan and with the cost of future service. This is consistent with he updated valuation assumptions as at 31 March 2021.*

[3] *ARC is Affordable Risk Capacity, so 150% of ARC corresponds to the present value of contributions of 15% of payroll over 30 years.*

Conclusion: The VIS

- **Current investment strategy is outside the Trustee's risk appetite**
  - The **total risk is beyond risk appetite** and the **profile of different risks is unbalanced**
    - Reverse stress tests show the self-sufficiency deficit could exceed 150% of the Affordable Risk Capacity
    - Stochastic modelling implies a relatively high probability of breaching 150% of ARC under the current strategy
    - Around 2/3 of the total risk is driven by liability-related risks

- **The VIS involves only a moderate change to the current allocation, but would be very different in the long term**
  - **Growth assets:** Same as the current allocation of c. 60%, but would remain much higher over time than the 2018 valuation
  - **Hedging assets:** Moderately higher hedging of interest-rate and inflation risks to Hedge Ratios of 40%
  - **Leverage:** Higher leverage of 137%, not out of line with large UK schemes for which the range is 100%-200%

- **Why now is an appropriate time to consider hedging**
  - The size of the Scheme has continued to grow relative to the size of the Higher Education Sector. So the risks have become more meaningful in relation to the Sector's risk capacity
  - Increasing the Hedge Ratios in the VIS is important to better align investment strategy with the Sector's risk capacity and the Trustee's risk appetite