HEDGING RATIOS IN THE CONTEXT OF INTEGRATED RISK MANAGEMENT

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Lincoln
PENSIONS
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Contents

Executive Summary

- Changing interest rates and inflation impact both upon employer covenants and their pension schemes
- Critically, during periods of recession; interest rates tend to fall, growth assets tend to perform poorly and, for cyclical sponsors, covenant strength tends to weaken. This combination can present difficulties for scheme funding and imperil the schedule of journey plans
- Changing the risk profile of a scheme's investment strategy, whether that be in the allocation of growth assets or in the determination of a hedging ratio, will change the balance of risks that are being taken by the scheme and its sponsor. The sponsor is the ultimate underwriter of the risks that the scheme carries
- Trustees can and should try to engage actively with their sponsor in developing a hedging strategy. Ultimately, if scheme assets allocated to growth investments underperform, it will be up to the sponsor to bridge the gap
- This changing balance should be viewed through the prism of an integrated risk management approach. Investment strategy should not be examined in a vacuum

"Trustees can and should try to engage actively with their sponsor in developing a hedging strategy."

Section 1: The basics of liability hedging

The value of a pension scheme's liabilities is sensitive to; expectations of future inflation and, to interest rates (actually, the discount rate established by gilt yields). If interest rates fall, or inflation rises, the value of liabilities will increase. Conversely, if interest rates rise or inflation falls, the value of liabilities will fall.

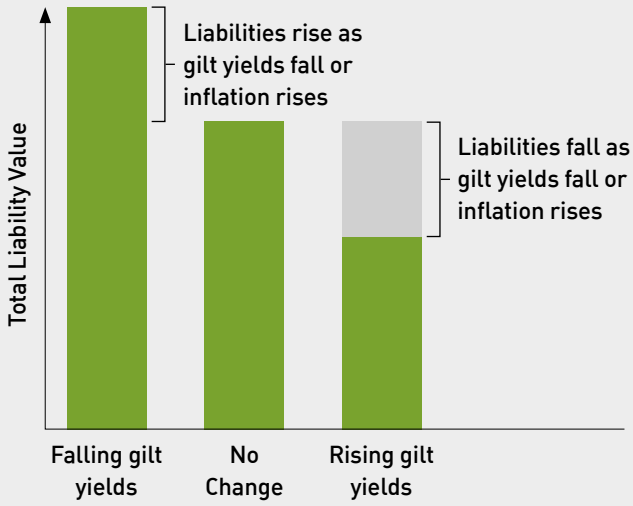
Interest rates and inflation are market variables, they change continually. Whilst this is brought into sharpest relief when periodic scheme valuations are finalised and reported, scheme liabilities (and the sufficiency of assets to meet those liabilities) are actually changing all the time.

This presents a continual risk to the solvency of a scheme because of the uncertainty of how interest rates and inflation may change in the future. Uncertainty can be addressed.

This is done by dedicating a portion of the scheme's assets to the construction of a portfolio of interest rate sensitive and inflation sensitive securities. The portfolio can be tailored to replicate the scheme liabilities' interest rate and inflation sensitivities. When assets' and liabilities' sensitivities match, uncertainty presents less risk to the scheme.

"Uncertainty can be addressed."

The liabilities of a pension scheme represent the future payments that will be made to beneficiaries. These payments rise with inflation. The scheme's total liability value is the discounted sum of all the future payments. Higher inflation or a lower discount rate (i.e. lower gilt yields) cause the total liability value to rise and vice versa



Section 2: Choosing what proportion of liabilities to hedge

The previous section talked in terms of matching sensitivities, of having a portfolio of assets that replicates the effect upon liabilities of changing interest rates and inflation. That is to say, a portfolio of assets that matches the *investment performance* of the liabilities.

But what should the size of this matching portfolio be? What proportion of the liabilities should be matched and thus, what proportion of the *nominal return* of the liabilities should be generated? You might think that 'all of it' would be a good place to start. But, things are not quite that simple.

Example

Let's have a look at two possibilities:

Portfolio A a matching portfolio sized to replicate 100% of scheme liabilities, and

Portfolio B a matching portfolio sized to replicate 100% of scheme assets,

And then consider these portfolios in each case for a scheme that currently has an 80% funding ratio i.e. it has liabilities of £100 and assets of £80

Let's say that a 1% change in the discount rate, would cause valuations to change by 20%

The *return performance* of assets and liabilities will be the same for both Portfolio A and Portfolio B i.e. +20% for a 1% fall in discount rates and -20% for a 1% rise.

However, because Portfolio B **is smaller** than Portfolio A, the *nominal return* that accrues to it when discount rates change will be smaller too.

The effect is that Portfolio A is able to keep a constant deficit and Portfolio B is able to keep a constant funding ratio.

	Start		Position after discount rates change			
			Portfolio A		Portfolio B	
			+1%	-1%	+1%	-1%
		Change in liability value	-20	+20	-20	+20
Liability value	100	→	80	120	80	120
		Performance of matching portfolio	-20	+20	-16	+16
Asset value	80	→	60	100	64	96
Deficit	**20**		**20**	**20**	**16**	**24**
Funding ratio	**80%**		**75%**	**83%**	**80%**	**80%**
				Deficit held constant		**Funding ratio held constant**

As can be seen in the example, a critical question is raised. What is more important for the scheme and for the scheme's sponsor; keeping the deficit 'locked-in' or keeping the funding ratio 'locked-in'?

The key to determining the answer to this question lies in an assessment of how the funding gap is to be closed. What proportion of it is to be closed by investment returns and what proportion of it is to be closed by deficit repair contributions (DRCs)?

Section 3: Bringing in the covenant angle

It is not only the pension scheme's financial position that is impacted by changes in discount rates and the inflation environment. The strength of the employer covenant may also be impacted by the same changes (although 'discount rates' in this context might better be referred to as 'the interest rate cost of debt finance', the price that an employer pays to borrow in order to finance its business operations).

- Many businesses have issued debt which is subject to variable interest rates or fixed interest rates that might require to be reset or refinanced in the near term

- This means that an increase in interest rates could reduce future cash flow generation and maybe reduce the extent to which the business remains compliant with restrictive clauses within its borrowing agreements

- And, for businesses that are not able to fully transfer cost increases to their end customers, inflationary environments could lead to reduced operating profit margins.

For most healthy covenants, however, changes in interest and inflation conditions only have a second order impact over the short to medium term. The impact may, of course, be more material for covenants that are weaker at that outset. In extremis, small disruptions to expected cashflows and profitability may threaten the viability of the business continuing if the covenant is already precariously positioned.

"Failing to identify the interplay can lead to unexpected requests for deferrals and reduced DRC proposals."

But it is perhaps falls in interest rates that might be most worthy of attention. Interest rates tend to fall during times when the wider economy is deteriorating towards a recession; times when businesses find that their operating environment is most challenged and the future least certain. This is also the time when a scheme's growth assets are most likely to be underperforming the expected returns that would have been incorporated into their journey plan.

This combination of factors could lead to a substantial increase in the liabilities of the pension scheme and a widening of its deficit. When experienced at the same time, negative impacts upon the sustainability of the business's financial position could result.

With these risks in mind, we are finding that CFOs and Corporate Boards are now more regularly monitoring the funding experience of their pension schemes.

Whilst trustees tend to focus on funding ratios, the sponsor will typically be more focused on containing the nominal value of any deficits and limiting the extent to which DRCs are required. Whatever the focus is, failing to identify the interplay between asset performance, hedging strategy, funding costs and covenant dynamics can lead to unexpected requests for deferrals and reduced DRC proposals. In the wake of the Coronavirus pandemic we are seeing some of those sometimes difficult discussions between trustees and sponsors starting. Naturally the stakes are higher for weaker covenants.

Section 4: Case study: The effects of a mild recession upon a scheme's reliance on DRCs

To illustrate the effect of a period of recession upon a scheme reliant upon DRCs we have modelled a simple case study example.

XYZ Plc is a highly-leveraged manufacturing company in a cyclical sector. It has a defined benefit pension scheme that is closed to new members. The scheme has a funding deficit but annual DRCs of £4.3m have been agreed between the scheme's trustees and the board.

The scheme's assets are invested 60% in a growth portfolio with an expected return of cash+2% and 40% in an LDI portfolio that provides discount rate and inflation matching for 100% of the scheme's assets. After strong returns from the growth portfolio over the past 12 months the scheme has recovered from Q1 2020's Coronavirus shock. Presently the scheme has assets of £240m and liabilities of £300m – a funding ratio of 80%, a position quite similar to that which the trustee's found themselves in when the DRC schedule was agreed.

With expected growth asset returns and a steady pace of DRCs as agreed, the scheme should achieve full funding over a 7 year period.

The trustees are aware that whilst their funding ratio is little changed since pre-COVID times, the total value of both their liabilities and their assets has been varying greatly. This variation led to the scheme's deficit being at its largest in nominal terms when discount rates were much lower during the Spring of 2020.

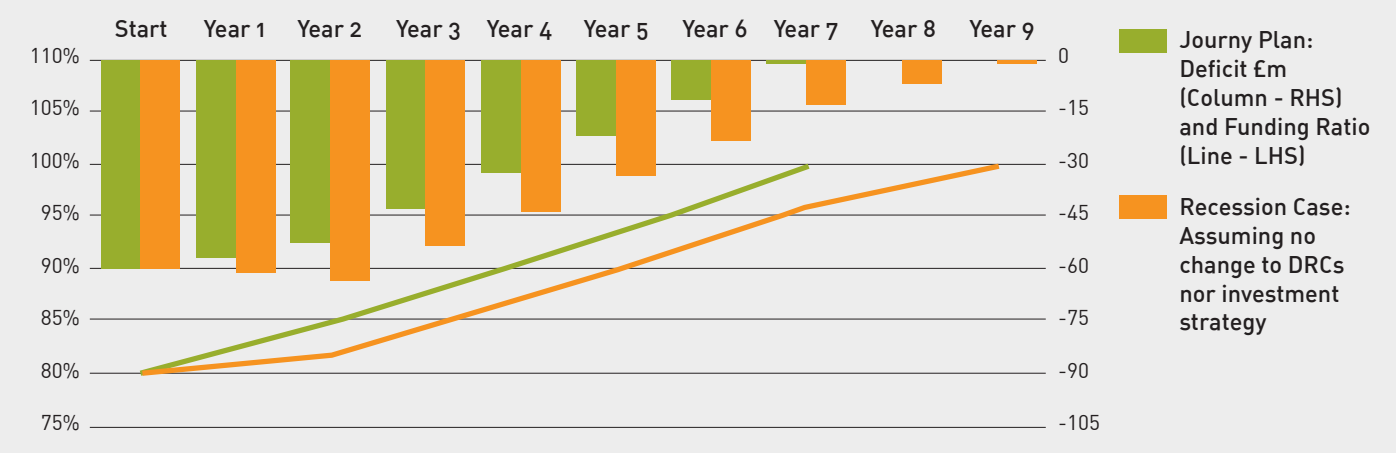
The trustees are concerned that should discount rates fall again that they might need to renegotiate the level of DRCs with XYZ's board in order to still be on target for full funding in 7 years' time.

Their concern is heightened as they are mindful of the cyclical nature of XYZ Plc's business and the advantage that XYZ presently has from low credit spreads in sustaining its high balance sheet leverage. Aware that a request for increased DRCs might be difficult should the present, conducive conditions deteriorate during a recession, the trustees have asked for some suggestions as to how their investment strategy might be changed to reduce their exposure to recession risks.

Base Scenario: How is XYZ Plc scheme's funding ratio and its deficit affected by a mild recession[1]? To frame the issue for the trustees, we first look at how their existing journey plan might be disrupted by a recession.

The fall in discount rates on its own would not change the scheme's funding ratio – the scheme has a "Portfolio B" (see example on page 5) style asset value hedging strategy. The scheme's nominal deficit would however increase. Because of the absence of investment returns from growth assets during the recession, improvements in the funding ratio would be derived only from DRCs in years 1 and 2. Also, because of the initial increase in the nominal deficit, after the recession finishes it would subsequently take longer for the scheme to reach its funding objectives if DRCs remained unchanged. The scheme's journey plan to full funding would extend to 9 years.

1 Throughout the case study we model a recession in years 1 and 2 comprising of a 100bp fall in discount rates combined with 0% returns from the scheme's growth asset portfolio. We model a typical UK pension scheme's asset allocation within the growth assets portfolio, and we also exclude any possibility that the trustees could seek additional DRC from XYZ Plc until after the recession finishes.



The implications of this "do nothing" base scenario are that;

- The scheme would retain a funding deficit for longer than originally planned and so would be reliant upon the strength of XYZ Plc's covenant for longer too; and
- XYZ Plc would cumulatively make DRCs of £38.7m (9 annual contributions of £4.3m) as opposed to the £30.1m that it had anticipated over the original 7 year journey plan period.

Options: Diluting the effect of disruption to the journey plan

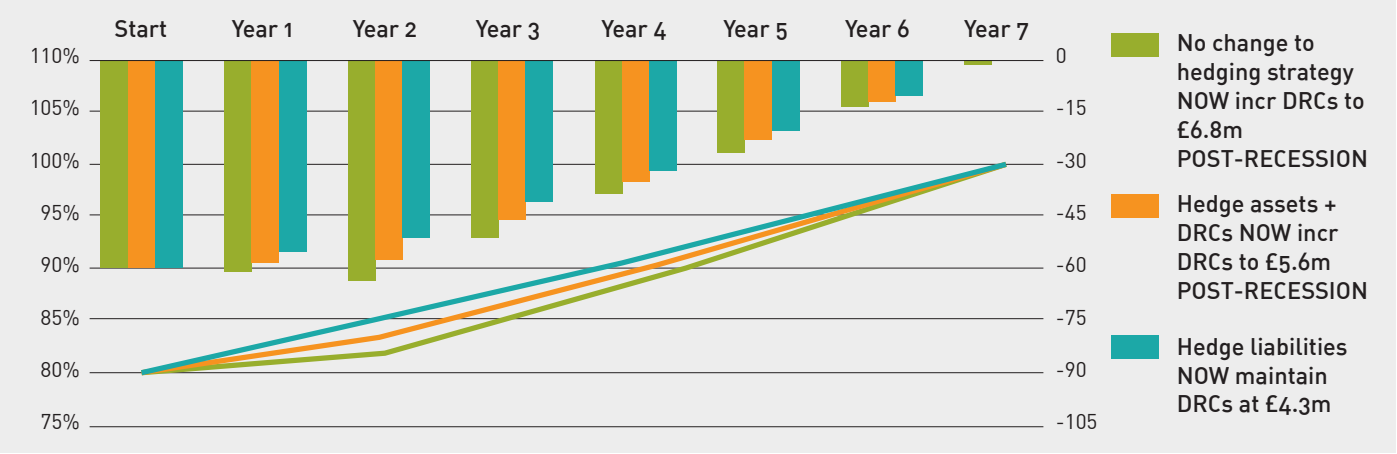
This risk of extension to the journey plan could be addressed in one of two ways; i) the trustees could re-risk their growth asset portfolio to seek higher investment returns in years 3 to 7 or, ii) XYZ Plc could increase its DRCs.

A combination of the two choices would also be feasible but, for now, let's concentrate on DRCs – this will gauge the parameters around which the trustees might be able to draw upon covenant support to stay on track without changing their growth asset investment strategy.

We are however going to open up some options for the trustees to consider. These options relate to changes in their hedging strategy. Noting that any such changes would need to be implemented ***now*** i.e. before the onset of the assumed recession and its associated 100bp fall in discount rates, to be effective.

The options opened up are;

1. Maintain the current strategy of hedging 100% of the scheme's asset value
2. Increase the level of hedging to match 100% of the scheme's asset value plus anticipated DRCs throughout the journey plan
3. Increase the level of hedging to match 100% of the scheme's liabilities



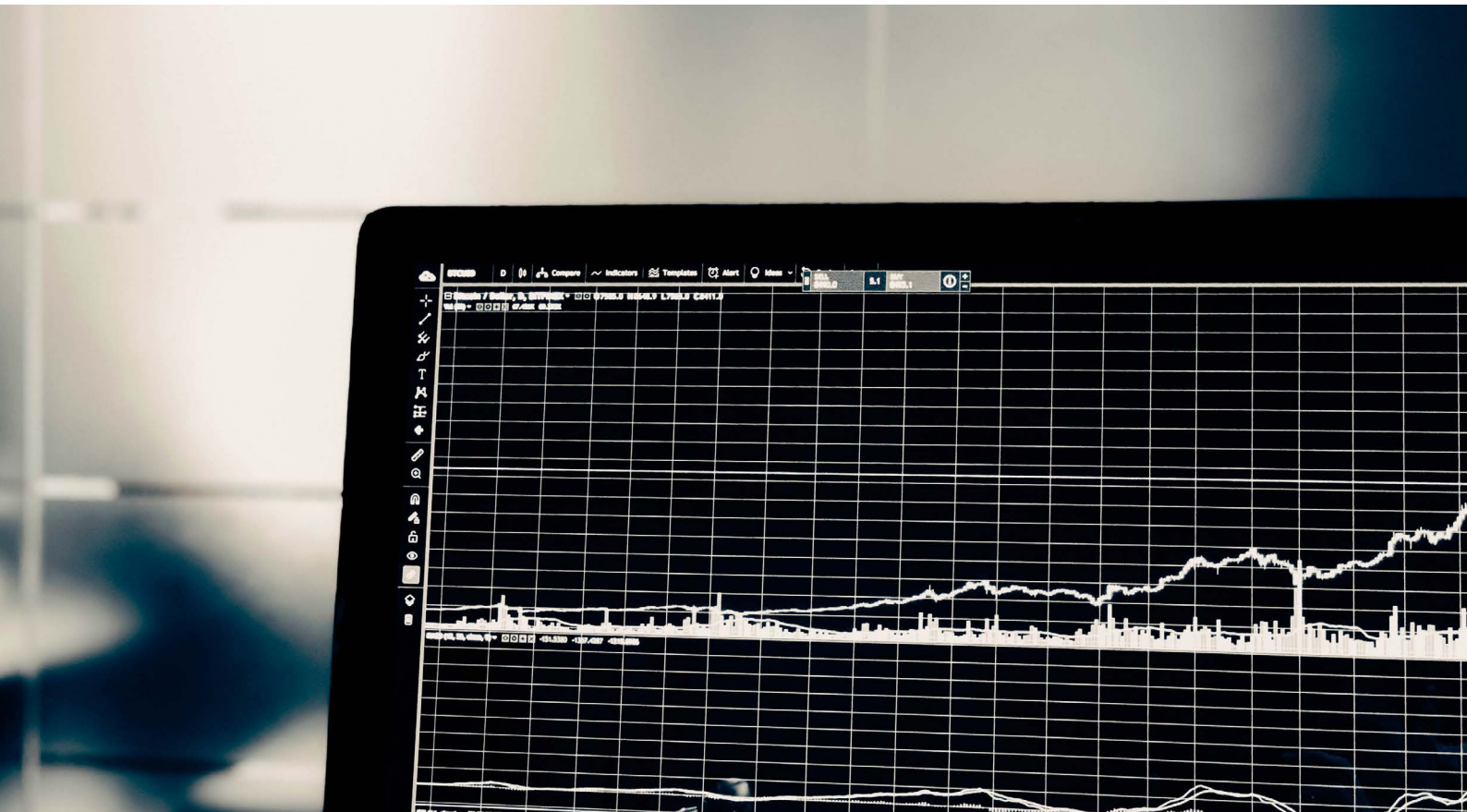
Under those different hedging strategies we find that different levels of DRCs would be required after the recession to keep the journey plan on track. We also find that as the level of hedging is increased, lower deficits and higher funding ratios result throughout the journey plan. The latter observation is to be expected. This is because as the hedging level is increased, through options 2 and 3, the matching portfolio that is constructed would become increasingly like "Portfolio A" and less like "Portfolio B" as illustrated in the earlier example.

In summary, the commitment required from XYZ Plc to make DRCs could be as follows;

£m	DRCs in years 1-2	DRCs in years 3-7	DRCs in years 8-9	Cumulative DRCs paid
Original Journey Plan	4.3	4.3	0	**30.1**
Recession Cases				
Do nothing and extend plan to year 9	4.3	4.3	4.3	**38.7**
Maintain hedging strategy and incr DRCs to achieve full funding in year 7	4.3	6.8	0	**42.6**
Hedge asset value + DRCs and incr DRCs to achieve full funding in year 7	4.3	5.6	0	**36.6**
Hedge liabilities and maintain DRCs to achieve full funding in year 7	4.3	4.3	0	**30.1**

The most expensive strategy from XYZ's point of view (and thus the strategy that leaves the scheme most reliant upon XYZ's covenant strength) occurs when the trustees do not change their hedging strategy but seek higher DRCs after the recession.

The cheapest strategy occurs if the hedging level is increased now to match liabilities. This option also delivers more favourable outcomes for the scheme, relative to alternatives, in terms of the trajectory of the funding ratio during the journey plan.



Section 5: Looking a little deeper into XYZ scheme's hedging considerations

For XYZ, as a covenant in a cyclical industry that might have its operational performance challenged by recessionary conditions, you might think that the automatic choice would be for the trustees to opt to hedge the scheme's liabilities and thus minimize exposure to those recessionary conditions (the 'all of it' conjecture from section 2!).

It's not quite as clear cut as that, there are a number of further considerations;

- Whilst hedging liabilities 'locks-in' the deficit, it means that when interest rates rise the scheme's funding ratio deteriorates. Consider the situation XYZ's scheme trustees would find themselves in if;

  i) XYZ's cyclical business was significantly damaged during the recession and,

  ii) interest rates rose in a more generalized economic recovery in year 3 and,

  iii) the subsequent rise in interest rates post-recession proved too much for XYZ's leveraged balance sheet and impaired business position to cope with.

  Here, if the trustees had hedged scheme liabilities, they would see their funding ratio fall, their deficit stand still (lower hedging levels would have allowed it to improve) and a likely request for deferral on the DRC plan. A possibly toxic combination for the scheme's solvency.

- Re-risking the growth asset portfolio might be an alternative option. Making the growth assets work a little harder in order to make up the ground lost during the recession could be used as a strategy that takes the pressure off any need to increase DRCs. This is generally suitable when the existing growth rate incorporated within the journey plan is not too demanding and the balance of risks spread between the scheme and its sponsor covenant is appropriate i.e. the risk balance takes into account the ability of the sponsor to maintain DRCs and underwrite the residual risks carried by the scheme.

- Hedging liabilities up to the value of the scheme's assets plus XYZ's anticipated DRCs should also be considered. Hedging at this level stabilises the proportion of liabilities that are to be met by growth asset investment returns rather than DRCs[2]. This approach presents an equitable balancing of risks ensuring that XYZ's obligations under the DRC schedule can remain steady in nominal terms. Maybe not suitable if the rising interest rate environment was critically impairing XYZ's financial position but, likely feasible in calmer times.

"Hedging liabilities up to the value of the scheme's assets plus XYZ's anticipated DRCs should also be considered."

2 If the DRCs are thought of as being an intangible asset of the scheme (a contingent debt 'owed' to the scheme by the sponsor) then hedging assets and DRCs is akin to establishing the "Portfolio B" style approach covering 100% of combined tangible and intangible assets.

Conclusion

As Q1 2020 falls out of year-over-year comparisons, the past 12 months has seen strong returns in growth asset investments and rising discount rates. This combination will have likely returned many funds back to their recent low points in terms of the nominal value of their deficits.

This presents an opportunity for trustees and sponsors alike to re-examine their liability hedging approaches.

But, as highlighted in the above case study it is establishing an appropriate balance of risks between the scheme and the covenant that is key to making sure that the scheme's journey plan is navigated as smoothly as possible. Trustees and sponsors should always therefore consider hedging through the prism of an integrated risk management approach.

Generally, Cardano would advise that the starting point for any re-examination would be to hedge liabilities up to the value of assets plus DRCs to the extent that the latter are sure to be received. This approach ensures that the proportion of the scheme's deficit that is to be covered by DRCs remains stable, irrespective of movements in long-term interest rates and inflation expectations. As a consequence, the only variable affecting the success or otherwise of the journey plan is whether growth asset returns achieve the target.

Although changes in a number of other actuarial variables could also impact upon the scheme's funding position, this hedging approach steadies the relationship between DRCs and investment returns within the journey plan. Clarity and transparency are provided as to the role of sponsor contributions and investment returns in closing the scheme's deficit. But, there are some situations where schemes and sponsors might both benefit from a more nuanced approach. An increased hedging ratio that 'locks-in' a deficit may make sense for schemes that have the following characteristics: The scheme is well-advanced on its journey to self-sufficiency;

- The deficit is small and / or has reduced over time
- The deficit measurement basis is clearly defined and agreed
- The return target for assets that remain in growth investments is undemanding.

The sponsor's ability to support and role in funding the remaining deficit is clear;

- DRCs are agreed between the trustees and sponsor
- DRCs will fund the deficit over a period of time that is consistent with the scheme's journey plan
- The sponsor's financial strength does not imperil the timely payment of DRCs and trustees are comfortable with the visibility that they have regarding the future preservation of this status.

"Establishing an appropriate balance of risks between the scheme and the covenant that is key to making sure that the scheme's journey plan is navigated as smoothly as possible."

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