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Managing LDI portfolio hedges amid volatile markets – an overview

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Rising interest rates have lowered future liabilities while decreasing LDI portfolio collateral levels. Here's how schemes can seek to balance this scenario.

This year has been characterised by rapidly rising interest rates, rampant inflation and heightened volatility, with specific impacts for liability-driven investment (LDI) portfolios. In this guide, we consider what this means for defined benefit (DB) schemes – and outline the steps they can take to safeguard assets in such a market environment.

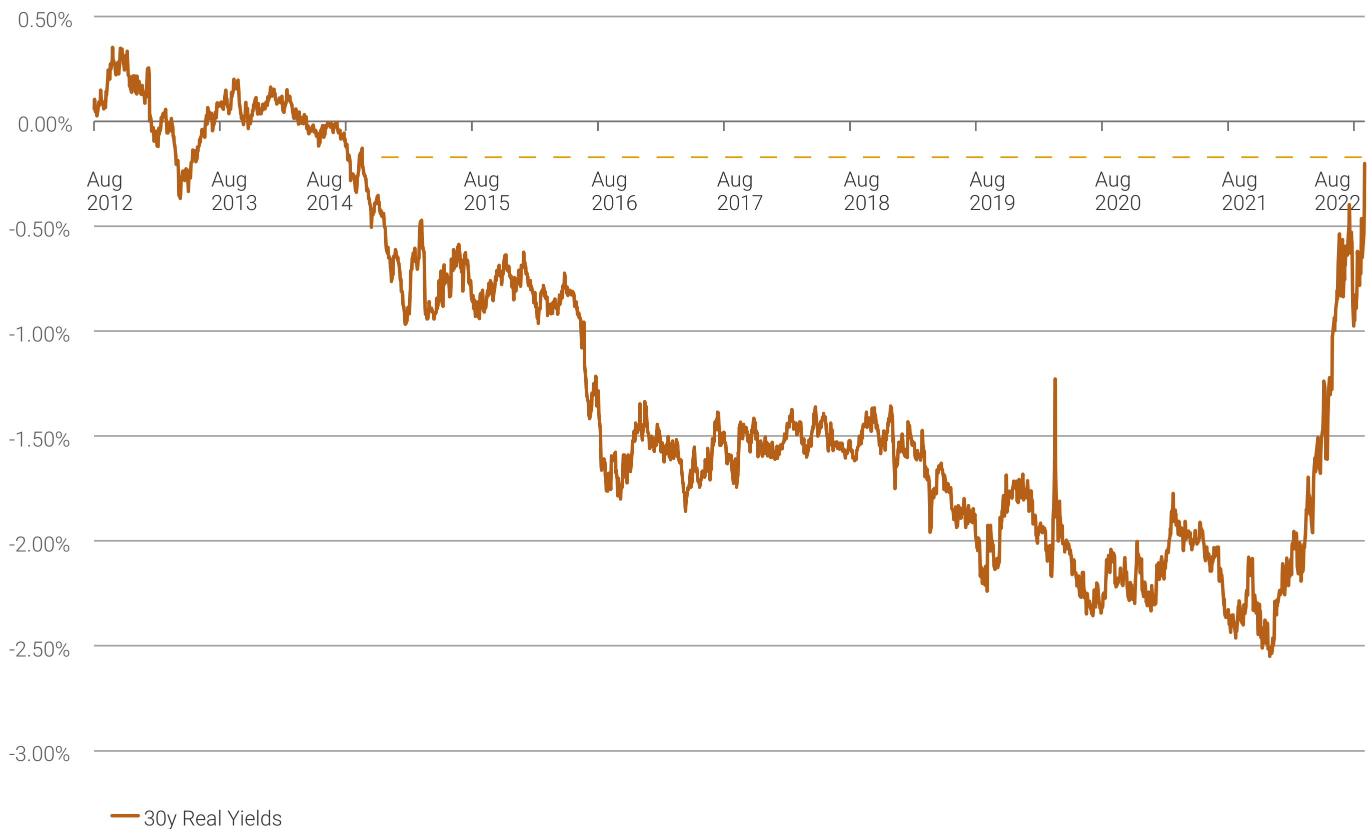
Levels of inflation have continued to rise since the start of this year, reaching highs not seen for several decades. The strength of energy prices, a tight labour market and supply-side bottlenecks caused by the pandemic have been the primary causes of the move, which has been exacerbated by the war in Ukraine.

To combat these inflationary pressures, central banks across the globe have been tightening monetary policy aggressively over 2022. The Bank of England has hiked rakes by a total of 1.5% so far this year, while the US Federal Reserve has raised rates by 2.25%, including raises of 0.75% in each of the previous two meetings, its largest single hikes in decades. This has led yields around the world to increase rapidly, rising to levels not seen since 2014 in a matter of six months. At the same time, bond markets have become increasingly volatile after the calm of the previous year, with large daily moves in yields.

After retracing briefly over July, yields have continued to move rapidly higher over August and into the start of September. Markets continue to be highly volatile with yields moving by 10 to 20 basis points in a single day, moves not seen since March 2020.

LGIM

Figure 1. 30y real gilt yields over the past 10 years



Source: LGIM as at 29 July 2022.

What has this meant for DB schemes?

For schemes, the sharp rises in interest rates will have led to a sharp decrease in liability values. For those schemes that are underhedged, this may have resulted in a funding position improvement as their liability values may have decreased by more than those of their assets. At the same time, schemes will have seen the level of collateral within their LDI portfolios decrease off the back of the rising rates.

Looking at how our clients were positioned at the start of 2022, schemes for which we manage LDI portfolios held an average level of collateral of 3.7x optimal.[1]

Following the yield rise of about 1.4% over the first seven months of the year, we have seen reduced levels of collateral within our clients' LDI portfolios, moving them closer to their optimal levels of collateral. Despite many clients having topped up their portfolios during this period, the average level of collateral now stands at 2.5x optimal.

Typically, we would expect clients to operate with a healthy buffer above the optimal level to avoid frequent collateral calls to top up their LDI portfolios. Therefore, we favour clients maintaining the level of collateral within their LDI portfolios at broadly 1.4x optimal, which is equivalent to yield headroom of 0.5%. Clients near or below the optimal level that haven't already topped up their portfolios may want to consider their options on where to source additional collateral in order to support their hedges.

1. For the purposes of this note we are defining optimal collateral as the minimum comfortable level of collateral at which the portfolio can operate; should the level of collateral fall below this we typically ask clients to top-up their LDI portfolio. For further information on how we calculate optimal and critical collateral levels, see the Appendix on page 7.

On the other side of the equation, clients with well-collateralised portfolios may want to take this opportunity to review the governance procedures they have in place, to ensure they are well-positioned should we see a further selloff in markets. For these clients, deploying a liquidity ladder may allow additional returns to be generated while continuing to have funds available to meet collateral calls on the LDI portfolio as required.

Figure 2. A view of our clients' collateral levels

	31 December 2021	29 July 2022
Average multiple of optimal	3.7x	2.5x
% of clients under 1.0x optimal	2%	4%
% of clients over 1.8x optimal	82%	64%

Source: LGIM based on internal data. Average based on median client.

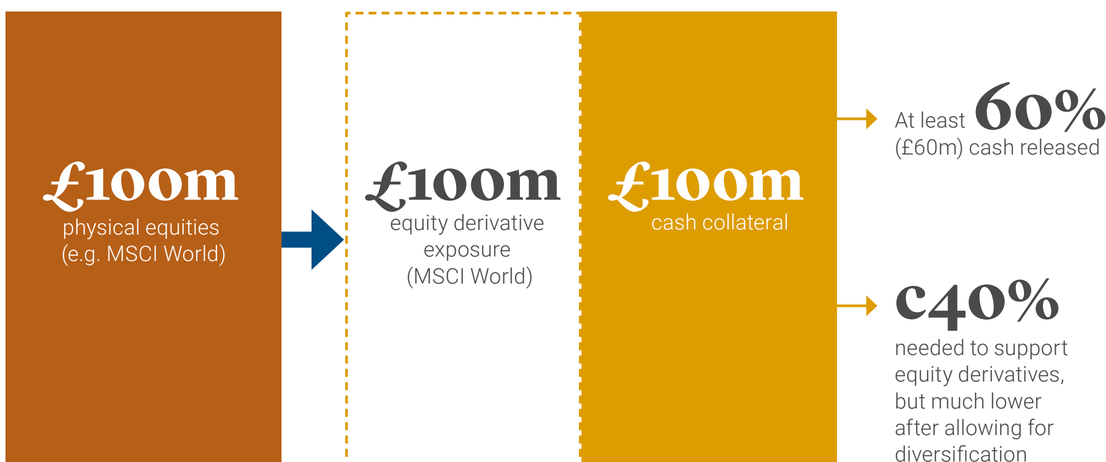
Topping up portfolio collateral

Replenishing collateral buffers within LDI portfolios will be essential for schemes, in our view, to ensure their hedges can remain in place should rates rise further in the future. Insufficient collateral could potentially force schemes to unwind exposures, leading to a reduction in the level of liability hedging. This would potentially leave them exposed should yields subsequently retrace lower.

Over the previous five years, as interest rates were relatively stable, pension schemes may have used the collateral built up within their LDI portfolios to fund growth allocations or to build credit portfolios. Now that this relationship has reversed, some schemes have already begun the process of reducing leverage within their LDI portfolios, with liquid growth assets such as equities being the first port of call for many to top up the level of collateral.

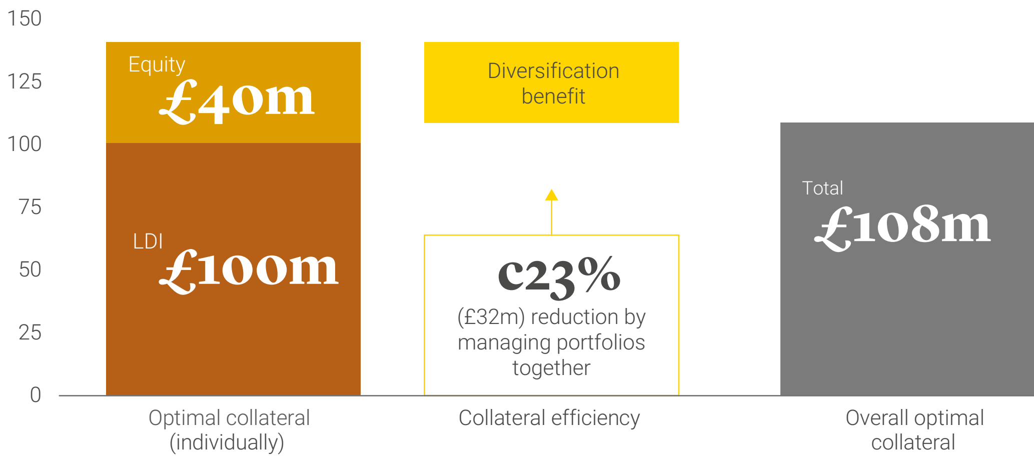
For clients who want to avoid selling down their equities at current levels, one option is to replace their physical exposures with synthetic exposures. By synthesising their holdings, schemes are able to release cash and increase the collateral buffer in their LDI portfolio while maintaining exposure to the underlying asset. We believe replication of the equity exposure can be done efficiently via equity derivatives, including market-cap weighted, multi-factor and ESG indices.

Figure 3. Synthesising equities may increase the collateral buffer



Source: LGIM. For illustrative purposes only

Figure 4. Diversifying leverage sources can bring increased efficiency to the collateral position



Source: LGIM. For illustrative purposes only

Synthetic equity and LDI mandates can be managed holistically, with a single collateral pool used to run all derivative exposures. Diversification has been the staple of growth portfolios for years, and we believe this should similarly be considered from a collateral perspective. Diversifying the sources of leverage across multiple asset classes may help bring about greater stability in the collateral position, reducing the overall amount of collateral required to be held. The chart above demonstrates the potential efficiency gains from diversifying leverage sources.

Another option for clients looking to generate collateral could be by selling physical credit assets and replacing the credit exposure with synthetic credit accessed via credit default swaps (CDS). While similar to synthetic equity in that this route allows clients to release cash from their holdings, CDS raise some additional considerations. Unlike synthetic equity, which aims to directly replicate physical equity exposure, CDS do not directly match the exposure of the physical credit. Instead, they aim to provide exposure to credit spreads only, versus the interest rate and credit spread exposure of physical credit. For those clients who are happy to accept some risk mismatch in comparison with that offered by physical credit, synthetic credit instruments such as CDS could provide a capital-efficient way to gain exposure to credit markets.

We believe greater care is needed where physical credit assets are part of a cashflow-matching solution, however, as clients will also need to make sure they are able to continue to meet pension payments should they sell down some of it. Interest-rate sensitivity also needs to be carefully considered. A significant potential advantage of integrating a physical credit and CDS mandate alongside an LDI portfolio can be managing the collateral while targeting an overall portfolio credit sensitivity, as well as the interest rate and inflation hedge ratio. This also alleviates some of the associated governance considerations outlined above and has an additional potential benefit in that targeted credit sensitivity could be used to align better with annuity pricing.

Putting a liquidity plan in place

Given the speed at which yields have moved in recent months, ensuring that schemes are in a position to be able to release collateral quickly has become a key priority. At the same time, we believe clients must consider balancing the need for liquid collateral against the potential drag on returns from holding large cash balances to serve as a top-up fund. Clients can put a cash-laddering solution in place to manage their cash pools efficiently in order to minimise return drag.

Clients looking to further reduce their governance burden can delegate the rebalancing between their LDI portfolio and a nominated top-up fund to an asset manager, such as LGIM, via a collateral waterfall process. This approach allows the scheme to continue to invest excess collateral in potentially higher-returning assets, aiming to maximise overall portfolio return, while still being able to call upon these assets at short notice if the level of collateral requires replenishing.

We believe there are some key features to consider when selecting the default option for sourcing collateral assets:

1. **Liquidity** – ensuring the capital is there when needed and accessible at a low cost
2. **Duration** – LDI portfolios call for collateral when interest rates are rising. If the collateral source has duration exposure, this can be an issue as the value of the liquid credit strategy will be falling at the same time the assets are needed to rebalance the LDI portfolio
3. **Enhanced return** – ensuring the fund has a strong track record of delivering in all market conditions, as well as paying attention to the fund's ability to protect on the downside

Certain absolute return bond strategies are popular choices for inclusion within waterfalls. These funds seek to generate stable and consistent above-cash returns in all market conditions, using liquid assets. Their primary objective is capital preservation.

Capital in the right place at the right time

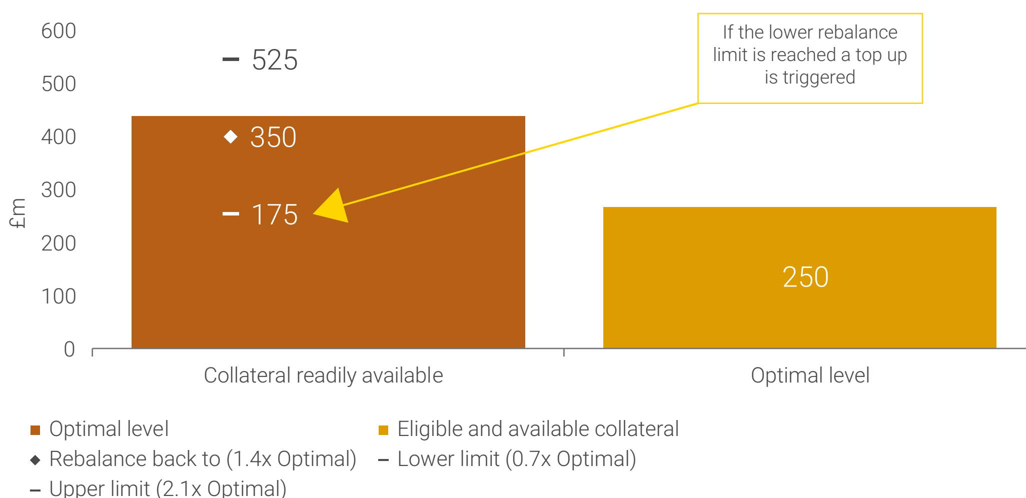
At LGIM, we agree the funds included in collateral waterfalls, and the levels at which collateral should be moved, with schemes and specify them in their unique guidelines, allowing us to manage the process automatically without needing further instruction. An example of how this could work is shown below.

Upper and lower limits are set around the level of collateral for the scheme. In this example a lower limit of 0.7x optimal and an upper limit of 2.1x optimal are shown. If collateral falls below the lower limit, we would rebalance from the nominated top-up fund into the LDI portfolio, bringing the collateral back to the central limit of 1.4x optimal. If the upper limit is breached, the excess collateral is moved from the LDI portfolio to the nominated top-up fund. This is aimed at ensuring collateral is in the right place at the right time – earning an additional return in the top-up fund, while remaining easily accessible should it be needed for the LDI portfolio.

Similarly, for those clients whose position means they don't currently need to synthesise equities but may look to do so in the event of a further selloff, putting the necessary processes in place now could allow for quick synthesisation should it be required.

New synthetic equity mandates can take around six to eight weeks to agree and set up – a significant amount of time in fast-moving markets. To further streamline the process, it is possible to set up equity synthesisation as part of a collateral waterfall, whereby the asset manager automatically synthesises equities should the LDI collateral fall below agreed trigger level.

Figure 5. LDI portfolios call for collateral when interest rates are rising



Source: LGIM. For illustrative purposes only

Summary

The significant rate rises we have seen over 2022 so far have meant that many schemes will have seen their funding levels improve but leverage levels increase in their LDI portfolio. Given the uncertain path of interest rates going forward, we believe schemes can look to remain robust against future rises by:

1. Ensuring their LDI portfolios are well-collateralised following the rate rises seen over 2022 so far
2. Considering synthesisation of physical equity or credit assets to release capital
3. Putting in place a liquidity plan for future collateral calls
4. Delegating responsibility via a collateral waterfall structure

Figure 6: Setting rebalancing limits for collateral action

<table>
<tr><th>LGIM Multiple of Optimal</th><th>Yield headroom</th><th>Collateral Action</th></tr>
<tr><td>0.8x</td><td>1.0%</td><td rowspan="2">Action: Top up collateral to [1.4]x</td></tr>
<tr><td>1.0x</td><td>1.2%</td></tr>
<tr><td>1.0x</td><td>1.2%</td><td rowspan="3">No Action: Collateral can float between [1.0]x and [1.8]x</td></tr>
<tr><td>1.4x</td><td>1.7%</td></tr>
<tr><td>1.8x</td><td>2.0%</td></tr>
<tr><td>1.8x</td><td>2.0%</td><td rowspan="2">Action: Excess collateral beyond [1.8]x held in Liquidity Ladder</td></tr>
<tr><td>2.5x</td><td>2.6%</td></tr>
</table>

Source: LGIM based on internal data. Calculations assume optimal stress of 1.25%.

Appendix

We calculate 'optimal' and 'critical' collateral levels in client portfolios which are tailored to reflect the instruments held. These calculations are completed by our Investment Risk team as detailed below. Our calculations for optimal and critical levels of collateral are in line with a value at risk (VAR) based metric which is the market standard in this space and in line with the approach taken by other market participants, for example, in the calculation of initial margin for centrally cleared trades by clearing houses.

The eligible collateral in the portfolio is then monitored daily against these levels **(see chart below).**

Our Investment Risk team calculates a 99% confidence VAR which defines the change in the value of the position for a 1 in 100 downside event using historic data from 2008 to today. In addition, a ten-year half-life is assumed which means that the more recent market history is more material than older market data.

A summary of the specific timeframes currently used with this methodology is as follows:

- **Optimal level of eligible collateral:** six-month 99% VAR
- **Critical level of eligible collateral:** one-month 99% VAR

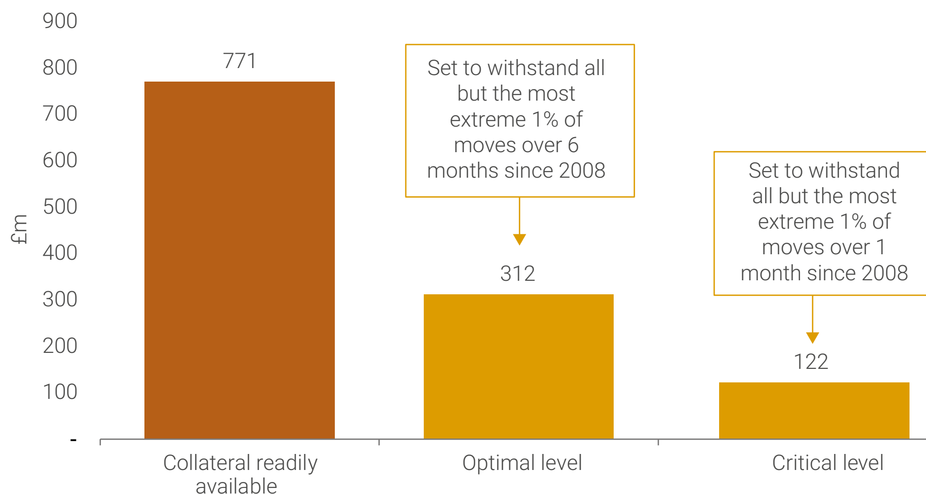
Examples by instrument

To put the above VARs in context we show indicative values for some different instruments (please note these are only indicative and can vary over time). Firstly, we express the VAR below as the impact of a change in yield for a 10-year zero coupon interest rate swap.

- **Optimal level of eligible collateral: six-month VAR:** 125bps* PV01
- **Critical level of eligible collateral: one-month VAR:** 50bps* PV01

We operate a VAR-based collateral sufficiency approach rather than a leverage approach as the latter is impacted by the term/duration of the instrument. This impact is illustrated below:

Our minimum collateral requirements (i.e. critical level) broadly translate to a maximum leverage of between 20 times (for a 10-year interest rate swap) to 4 times (for a 50-year interest rate swap). Our optimal collateral requirements broadly translate to a maximum leverage of between 8 times (for a 10-year interest rate swap) to 2 times (for a 50-year interest rate swap).



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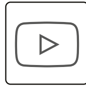

Key risks

The value of an investment and any income taken from it is not guaranteed and can go down as well as up, you may not get back the amount you originally invested. Assumptions, opinions and estimates are provided for illustrative purposes only. There is no guarantee that any forecasts made will come to pass.

Interest Rate Risk Warning

Interest rate risk is the risk that arises for bond owners from fluctuating interest rates. Interest rates and bond prices are inversely related, so if interest rates increase, bond prices will decrease and vice versa. How much interest rate risk a bond has depends on how sensitive its price is to interest rate changes in the market. The sensitivity depends on two things, the bond's time to maturity, and the coupon rate of the bond. Bonds with longer maturities generally have higher interest rate risk than similar bonds with shorter maturities. Bonds offering lower coupon rates generally will have higher interest rate risk than similar bonds that offer higher coupon rates.

Liability-Driven Investment Strategy Risk Warning

Liability-driven investment strategies are driven by the sum of your current and future liabilities. An example would be a defined benefit pension scheme that must make future pension payments to scheme members over their expected lifetimes. A pension scheme following an LDI strategy focuses on the pension-scheme assets in the context of the promises made to employees and pensioners (liabilities). This is in contrast to an approach which focuses purely on the asset side of the pension scheme balance sheet. Typical LDI strategies involve hedging, in whole or in part, the pension scheme's exposure to changes in interest rates and inflation. These risks can eat into a pension scheme's ability to keep their promises to members. Historically, bonds were used as a partial hedge for these interest rate risks but the recent growth in LDI has focused on using swaps and other derivatives. These various approaches offer significant additional flexibility and capital efficiency compared to bonds, but also raises issues of added complexity, especially when the rebalancing of an LDI portfolio following changes in interest rates is considered. Counter intuitively the hedging portfolios are designed to gain value where interest and inflation rates increase the value of future liabilities, but more importantly the hedging portfolio is designed to lose value where those same future liabilities diminish. LDI strategies will also involve significant use of leverage, particularly where the pension scheme is seeking to free up assets in order to pursue an additional non-hedging investment strategy that is seeking to close any funding gap that the pension scheme may be experiencing.

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