SPECIAL EDITION

OCTOBER 2022

PENSION FUNDS LETTER

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UK LDI crisis. Implications for European corporate pension funds

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Given the yield increases at the announcement of the UK accommodative mini-budget a week ago, pension schemes suffered a massive liquidity crisis related to their leveraged LDI strategies. This drove the Bank of England to temporarily halt Quantitative Tightening.

Yet rather counterintuitively, pension schemes have never been better positioned as their funding levels are higher than ever. This was such a severe event that it certainly contributed to UK Prime Minister Liz Truss's announcement on Monday 3rd October: she will partially reconsider her government tax cut plan.

The events that unfolded in the UK, whilst dramatic, are unlikely to be repeated in the exact same manner in the rest of the world:

- UK pension fund investments represent around 120% of GDP[1], unrivalled across other economies (with the notable exception of the Netherlands, which, in contrast, can use the whole Euro market for its investments) which leads to a concentration of government bonds ownership that is much higher in the UK.
- The leverage characteristics of LDI are unique to the UK: use of repos and pooled strategies with high leverage are not common in the rest of the world. Pension schemes investing in pooled LDI strategies were unprepared: they had to find swiftly assets to meet the demands of their LDI managers who have no direct access to the rest of their portfolios.
- Adoption of LDI is mainstream for UK Pension schemes, more so than in many other countries.

Nevertheless, there are still some lessons to be learned for pension funds across the world:

a. Review your liquidity stress test.

b. Adapt the leverage strategy to the environment: more volatility in rates should lead to higher liquidity buffers and to looser LDI constraints (e.g. lower leverage targets).

c. Be careful what you call liquid: darling assets of the last decade are not liquid and cannot be relied on for liquidity purposes. **Be careful** what you call LDI: illiquid assets with long duration characteristics have behaved very differently relative to typical LDI assets.

d. Be prepared to find innovative liquidity solutions: act now to be ready should you need to exchange your liquid assets for cash whilst keeping some growth asset exposure.

e. Assess if it's time to **reconsider LDI size**: the current environment might actually be a good entry point for more LDI strategies. With the increase in funding ratios, glide path strategies recommend an increase in liability hedging.

1. See https://www.oecd.org/finance/private-pensions/pensionmarketsinfocus.htm

1. The liquidity and LDI vicious circle

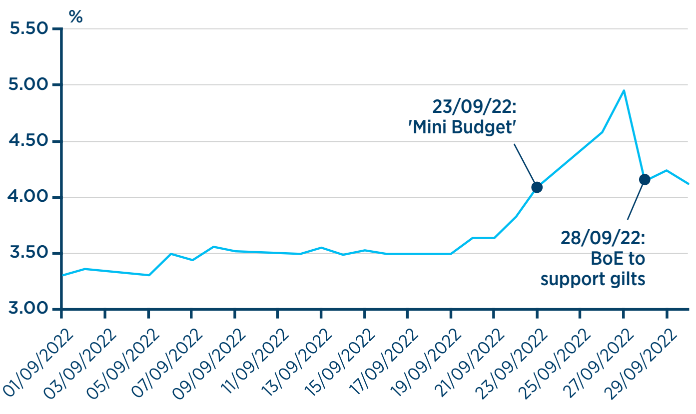
Last week's events

On **Friday September 23rd 2022**, UK chancellor, Kwasi Kwarteng, presented his so-called "mini budget" that included major changes in UK fiscal policy to combat inflation and soaring energy costs. The addition of historical tax cuts to already announced large spending packages would increase deficit and create significant borrowing needs for the UK. This mini budget was announced as the Bank of England (BoE) was actively tightening monetary policy against surging inflation by raising rates and starting to decrease its balance sheet size: this included Quantitative Tightening through the sale of gilts accumulated over the period of Quantitative Easing.

This mini budget announcement triggered a sharp market reaction that pulled the GBP to historic lows vs the USD over that weekend, whilst UK 30y yield soared from 3.5% to 4.5% early last week. This sharp movement forced the Bank of England to intervene on **Wednesday 28th September** to stabilize UK interest rates: BoE announced a one-month postponement of the Quantitative Tightening timeline and a £65bn package to regularly intervene on the gilt market until the 14th of October. **A significant U-turn in the tightening cycle.** These events have caused such grave market turbulences that UK Prime Minister, Liz Truss, partly abolished mini-budget tax cut plans on October 3rd.

The root of this intervention was specifically aimed at helping UK pension funds that had been caught in a vicious cycle for a few days: the more yields increased, the more pension funds had to quickly sell assets (gilts in particular) to accommodate derivatives and/or repo margin calls, fuelling the yield increase itself, and completely disrupting the gilt market.

Chart 1: 20yr Gilt rate evolution since 01/09/22

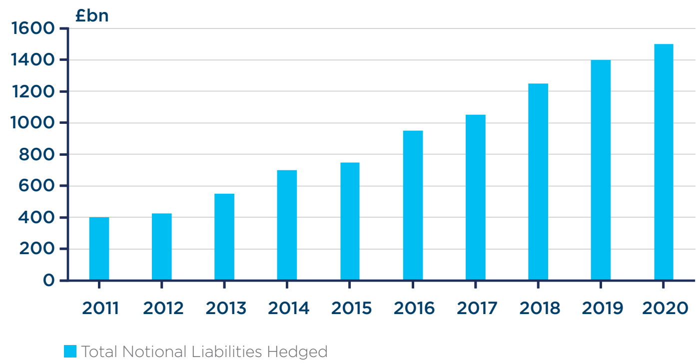


Source: Bloomberg, 30/09/2022

Backgound on LDI

The main reason for this sudden and massive off-load of assets by UK pension funds is their exposure to Liability Driven Investment strategies ('LDI'). A number of factors (regulatory, accounting, rating agency and market pressure) have pushed pension schemes to better manage their liabilities: this has led to a tripling of the LDI market over the last decade.

Chart 2: Notional value of LDI (2011-2020)



Source: https://www.theia.org/sites/default/files/2021-09/IMS%20report%202021.pdf

Mechanism underpinning a 3-day bond sell-off vicious cycle

LDI portfolios incorporate leverage on interest rate and inflation exposure that allows pension funds to keep exposure to growth assets whilst hedging their liability risk at the same time: in times of extreme liquidity crisis, they may have to sell growth assets when rates increase. As a leveraged strategy, LDI portfolios are subject to precise rules and regulations, including collateral posting and leverage control. Failing one of these obligations would not mean an actual failure of the pension fund, but instead the immediate termination of their liability hedging instruments.

As yields went up (and gilt prices went down), pension fund and LDI managers started to sell their liquid assets in bulk so as to:

- access cash and honour the significant margin calls on their derivatives (as pension funds hedge their liabilities interest rate risk, they experience a loss in mark to market on their derivative exposure when rates are going up)
- reduce the leverage of the LDI portfolios (as prices of assets were pulled down, leverage had mechanically increased). In particular, pooled LDI vehicles were probably among the first forced sellers as they usually have higher leverage and slower access to cash (as they need to coordinate their holders)

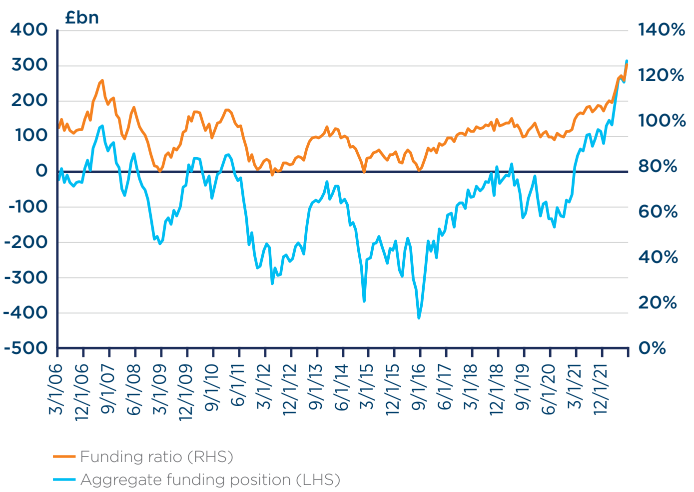
A particularly aggravating factor of the UK market is that pension funds are the largest holders of gilts, at par with BoE's Asset Purchase Facility: they hold about 30% of the total amount of gilts in issuance. The simultaneous sale of their holdings had a huge impact on bond prices, which in turn reinforced the need for collateral posting of pension funds. This vicious circle materialized during historic market disruption and massive sell-off on gilts and linkers market.

Despite this 'technical' blip, pension schemes are doing well

It is worth noting that this "technically driven" event did not jeopardize the solvability of pension funds, in the short term at least. A rate increase means that the value of liabilities are reduced. As LDI strategies suffered, the liabilities they were hedging were reduced by at least the same amount. This means that the solvency of pension schemes has not deteriorated in the last week.

Actually, it may be the opposite: UK pension schemes are often 'underhedging' their liability risks. The steady yield increase in the past few months has significantly improved their funding ratio despite difficult equity markets: UK Pension Protection Fund data shows that the funding ratio of UK pension funds increased from 118.2 per cent at the end of July 2022 to 125.1 per cent end of August.

Chart 3: Historical aggregate funding position and funding ratio of schemes in the PPF universe



Source : https://www.ppf.co.uk/ppf-7800-index#:~:text=The%20funding%20ratio%20increased%20from,2022%20to%20125.1%20per%20cent.

2. Lessons learned

The events that unfolded in the UK are unlikely to be repeated in the exact same manner in the rest of the world:

- the concentration of ownership of government bonds is much higher in the UK
- the leverage characteristics of LDI are unique in the UK: usage of repos and pooled strategies with high leverage are not common in the rest of the world
- adoption of LDI is mainstream for UK Pension schemes, more so than in many other countries

That being said, there are still some lessons to be learned for pension funds across the world. In the below, we identify four important lessons.

Lesson 1: Collateral and leverage should be adjusted in a volatile environment

Rate volatility: not only a UK story

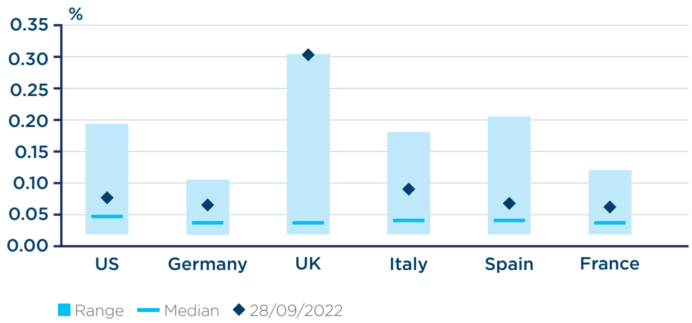
The macro economic backdrop presents serious headwinds. Central Banks across developed countries are implementing fast-paced Quantitative Tightening in order to prevent inflation becoming entrenched in expectations.

At the same time, Governments are promising massive fiscal packages to shield consumers from the cost-of-living crisis and businesses from increased energy costs (Germany just announced a €200bn energy aid package).

The recent UK story shows these two policies can undermine each other. In fact, governments will face challenges in financing their relief packages in a context where Central Banks, committed to their price stability mandate, are inevitably drying up liquidity in the bond markets by getting rid of debt in their balance sheet.

High volatility in financial markets is here to stay for the next 12 months. In the chart below, you can see that the 30yr rate volatility is way above historic median levels, with sharp repercussions: a 1% move in 30yr rates will have a price impact of 20-30% on bonds. A 2% impact will reduce bond prices by roughly twice as much.

Chart 4: Daily volatility ranges of 30yr government yields



Source: Amundi Asset Management, Bloomberg

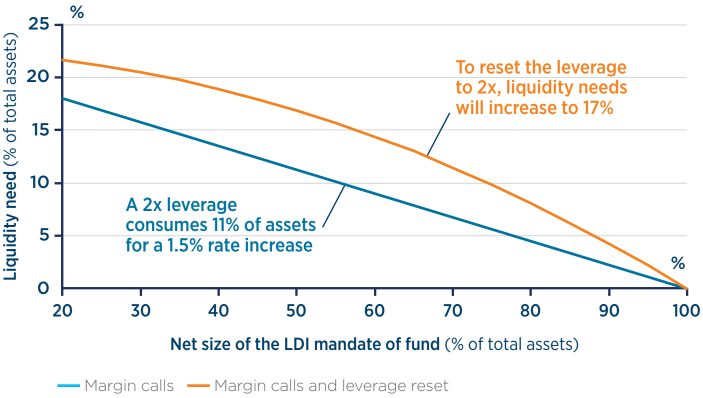
Notes: Daily Volatility of interest rate changes is calculated on a rolling basis assuming a 20-day window. The sample spans from 1st October 2002 to 28th September 2022.

Dynamic liquidity management when rates volatility is high

These events emphasize the importance of liquidity management when using leveraged LDI strategies. Pension funds typically keep a liquidity buffer to absorb margin calls[2] and to maintain their leverage at a desired level:

To illustrate this, take the example of a typical pension scheme with 15yr duration liabilities and a 100% funding ratio. Suppose this pension scheme hedges 100% of their liabilities' interest rate risk: if the LDI strategy consumes 50% of the assets, leverage is set at 2x. **The graph below shows that such a pension fund would need to liquidate 17% of their assets in case of a 1.5% increase in rates, as happened last week in the UK.**

Chart 5: liquidity needs in case of a 1.5% rate increase for a typical pension scheme



Source: Amundi 30/09/2022. Assumes 100% funding ratio, 100% liability interest rate hedge and a 15yr duration liability.

This buffer gets higher with leverage. In the UK, some LDI strategies can have a 5x leverage. In this case, the liquidity needed could be as large as the size of the assets invested in the LDI strategy prior to the rate move.

We have seen that liquidity needs are a direct impact of interest rates movement. Thus, the sizing of the liquidity buffer requires an interest rate stress scenario calibration. As per Chart 6, the volatility of 30yr yields in the UK at 0.30% is close to eight times its median level (0.04%).

Whilst less acute, the picture is similar in the rest of Europe: current volatility is between 1.5 to 2.25 times their historical median level. One would expect therefore that pension funds with an LDI strategy calibrated for a median volatility level would adjust their liquidity and leverage to reflect the current environment. Pension funds might find that tight constraints on their LDI strategy relative to their liabilities could be enlarged: in a highly volatile environment, breaches are more likely. Resolving them will entail frequent and costly trading. **It might be wiser to relax constraints until markets cool down.**

Chart 6: 30-yr yield volatility as of 28/09/22

30-Year Nominal Yield Daily Volatility					
	Last	Percentile	Minimum	Median	Maximum
US	0.08%	92%	0.02%	0.05%	0.19%
Germany	0.06%	91%	0.01%	0.04%	0.11%
UK	0.30%	100%	0.02%	0.04%	0.30%
Italy	0.09%	94%	0.01%	0.04%	0.18%
Spain	0.07%	84%	0.01%	0.04%	0.20%
France	0.06%	91%	0.01%	0.03%	0.12%

Source: Amundi Asset Management, Bloomberg

Notes: Daily Volatility of interest rate changes is calculated on a rolling basis assuming a 20-day window. The sample spans from 1st October 2002 to 28th September 2022.

Lesson 2: be careful what you call liquid, be careful what you call LDI

As in most market crises and as in the UK the recent days, liquidity is a concern for many pension investors. In light of the extreme volatility in UK yields, UK pension funds were seeking short-term liquidity to maintain their often-levered hedges on inflation and rates. In particular, they had to restore collateral value and to meet additional variation margins from swaps immediately.

In this very time sensitive situation, pension funds found themselves in a forced asset sale and felt the pain of low liquidity in their asset base. What stands out this time is that even UK gilts experienced impaired liquidity due to massive market impact of strongly rising yields and the pure size of UK LDI assets.

Certain schemes with large liability hedging allocation had to sell growth assets instead of liability hedging assets. In particular, **everyone's darling asset classes of the last decade such as private credit, infrastructure and private equity were not liquid.** They obviously did not qualify as collateral in the turmoil of these days; in addition, as their value is not easily marked to market, they are likely not to have suffered as much as LDI or equity assets. **It is therefore likely that their allocation weight is now much larger than desired, triggering rebalancing issues.**

Several real estate managers have had to limit institutional investors' withdrawals in the UK given the large number of redemption requests they had received. Some of these assets, (such as private or infrastructure debt) were considered part of liability hedging assets. This could be challenged given their different behaviour relative to LDI assets.

*2. The amount of cash needed to absorb margin calls can be approximated by: Margin call = Size of the LDI mandate * (leverage -1) * duration * interest rate increase.*

Going forward, the lesson learned for EU pension schemes is that liquidity can come to the top of the agenda suddenly and unpredictably. EU pensions should also be mindful that if illiquid strategies are obviously not a good source of cash, other supposedly liquid assets classes like treasuries -in this case gilts - can also show low liquidity when most needed due to adverse market impact.

Lesson 3: be prepared to find innovative liquidity solutions

In circumstances where the cash buffer is insufficient to satisfy margin calls, a pension fund can draw additional cash from growth assets. Selling these assets would typically involve sacrificing the expected returns of the pension fund. Nevertheless, to obtain cash without forfeiting exposure to growth assets, the pension fund can:

- Replace equity investments with future contracts. This is particularly efficient in case of passive equity funds, and can be done very quickly once the pension fund has setup access to futures markets.
- Enter into a repo transaction for some of the pension fund assets with a bank, in order to obtain cash as collateral. Depending on the nature of the assets, negotiation of the contract can be lengthy, and should be prepared beforehand.

Lesson 4: time to reconsider LDI size?

On 30th September 2022, IPE asked "Goodbye, LDI?[3]". Indeed, when EU pension investors look at the tense situation of their UK peers, they might become scared of the high volatility. However, it is advisable to keep a cool head. The recent regime shift in rates not only increased volatility but also strongly improved funding ratios. As most of EU pensions were short duration versus their liabilities, the market impact from rates helped to outperform liabilities to an extent far beyond that which common growth assets could.

As a result, the better funding ratios at today's rate and spread levels can show an interesting opportunity to revisit the split between your LDI and growth assets. Apart from the present turmoil, pension funds may take advantage of the changed market environment to de-risk their pension strategy from a strategic standpoint.

3. https://www.ipe.com/news/analysis-goodbye-ldi-too-early-to-say/10062488.article