

## Supplementary evidence from Professor David Blake LDI0067

Thank you for your letter of 14 February, which contains some specific questions and also invites me to make any additional observations. I think it would be easier to respond by combining my previous written submissions into a single document representing my views.

### **1. Leveraged LDI products were responsible for the systemic crisis in the UK government bond market in September 2022**

It is important to understand that leveraged LDI providers caused the systemic financial crisis last September: they were not innocent bystanders in a political crisis. [A paper in CAPX](#) makes clear that the Bank of England decision to raise interest rates on 21 September and the mini-budget on 22 September led to a small increase in interest rates. But the subsequent spike in rates was triggered by leveraged LDI providers using gilt repos and interest rate swaps as part of their hedging strategy. The counterparties to the repos and swaps (i.e., banks) began demanding cash collateral/margin across all pension funds at the same time (in response to these small increases in interest rates). Pension funds were forced to sell gilts to provide the cash to meet these demands. Since there was insufficient daily liquidity in the gilts market to fulfil all these sales at existing prices, gilt prices fell and interest rates rose further. This triggered additional cash collateral/margin calls and gilt prices fell even more. This resulted in a doom loop in which interest rates rose by unprecedented amounts in a few days.

There are many previous examples of this. For example, exactly the same happened with a product called [portfolio insurance which caused the 1987 US stock market crash](#).

In both cases, small changes in sales (of gilts in the case of leveraged LDI and of US equities in the case of portfolio insurance), while appearing innocuous at the level of the individual fund, turn into a systemic crisis when all funds are trying to sell at the same time and market liquidity dries up.

I would even go as far to say that leveraged LDI was instrumental in the downfall of a British Prime Minister and her Chancellor.

### **2. The events of September 2022 should be classified as a banking crisis – the first banking crisis in the UK since the Global Financial Crisis of 2007-08**

Pension funds are formally classified as non-bank financial institutions (NBFIs). However, leveraged LDI turns pension funds into banks or at least shadow banks. This is because they were engaging in the two principal banking activities of maturity transformation (borrowing short term via repos/swaps and investing in longer term assets (eg 10 or 30 year gilts and growth assets, such as equities) and liquidity transformation (converting cash into illiquid LDI products). Strictly, they should have been regulated like banks under [Basel III solvency rules](#), with minimum capital, leverage and liquidity requirements. It is not clear that pension scheme trustees were aware of this. Nor is it clear that pension funds would have satisfied the minimum capital, leverage and liquidity requirements of Basel III, especially those in deficit.

I wrote a paper entitled [“The Great Game Will Never End: Why the Global Financial Crisis Is Bound to Be Repeated”](#) in May 2022. When it was published, I sent copies to Andrew Bailey, Governor of the Bank of England, and Sam Woods, Chief Executive Officer of the Prudential Regulation Authority.

Following the panel session on 1 February 2023, I sent a copy to Sarah Breeden, Executive Director for Financial Stability, Strategy and Risk, at the Bank. I received no response.

Yet the September 2022 crisis is the first example of a banking crisis and the continuation of the 'Great Game' in the UK post-GFC. And once again – as in the case of all banking crises throughout history – it was caused by excessive leverage.

### **3. Despite being aware that leveraged LDI could cause a systemic financial crisis, the UK's financial regulators did not put in place measures to reduce the likelihood of one occurring**

There were multiple regulators involved in this crisis: The Pensions Regulator (TPR), the Financial Conduct Authority (FCA) and the Prudential Regulation Authority (PRA) which is part of the Bank of England.

Each has different responsibilities and there appears to have been no overall oversight. It is arguable that leveraged LDI fell through the gaps between the regulators.

[Lord Simon Wolfson](#), the chief executive of Next, warned Bank Governor Mark Carney in 2017 about the potential systemic risks associated with leveraged LDI.

In November 2018, the [Financial Stability Report](#) of the Bank's Financial Policy Committee, which is responsible for UK financial stability, warned of 'potential calls on collateral that could arise in a stress. ...It is not clear whether pension funds and insurers pay sufficient attention themselves to liquidity risks. For example, initial work by Bank staff has found that some insurers may not be recognising fully all the relevant liquidity risks'.

TPR followed up with a survey on pension scheme leverage and liquidity in December 2019 ([The Pensions Regulator/OMB Research, DB Pension Scheme Leverage and Liquidity Survey](#)). The level of leverage ranged from a multiple of 1 to a multiple of 7 – with total leverage across the industry of £500bn. The FCA surveyed leveraged LDI providers who reported that they 'felt' that they had sufficient liquidity to deal with an increase in yields of 150 basis points.

However, between mid-August and mid-September 2022, [30-year gilt yields doubled from 2.5% to 5% or by 250 basis points](#). Most of this rise was caused by the repeated cash collateral/margin calls driving down gilt prices and driving up yields once the doom loop had started.

The reality is that the leveraged LDI providers did not understand the systemic implications of their collective behaviour to meet the collateral/margin calls (i.e., it was worse than not 'paying sufficient attention'). There was insufficient liquidity in the system to deal with a 150 basis points increase in yields, let alone a 250 basis points increase.

Further, the UK's financial regulators, despite being aware that leveraged LDI could cause a systemic financial crisis, did not put in place measures to reduce the likelihood of one occurring. Examples include adequate stress testing and the pledging of assets – discussed below.

The only solution to the crisis was the Bank's emergency facility, once the crisis had started, to buy up to £65bn of bonds from pension funds. In the event, only £18bn of bonds were purchased.

### **4. Formal stress testing of leveraged LDI products should have been undertaken**

The FCA survey of leveraged LDI providers indicated that they 'felt' they had a sufficient liquidity buffer to deal with an increase in yields of 150 basis points. This turned out not to be enough once the crisis had become systemic.

In a [letter dated 30 November 2022](#), the Central Bank of Ireland (as a EU financial regulator in a country where a significant number of LDI funds are registered) reported that the 'resilience of GBP LDI Funds across Europe has subsequently improved, with an average Yield Buffer in the region of 300-400 basis points being built up' and it did 'not consider that any reduction in the resilience at individual sub-fund level is appropriate at this juncture'.

Yet this yield buffer could actually be too much since the increase in yields during the crisis was 'only' 250 basis points. In any case, it looks like a 'finger in the air' approach to setting standards.

In order to assess what the appropriate liquidity buffer should be, there needs to be suitable stress testing. This is a well established practice for banks and insurers. For, example, insurers are subject to [Solvency II](#) regulations and capital requirements and have to ensure that they have sufficient loss absorbing capital to meet their claims over the course of one year with a probability of 99.5% (equivalent to surviving every eventuality, except for a 1-in-200 year extreme event).

There should be a similar appropriate stress test for leveraged LDI products. But it is critical that the stress test takes into account the systemic consequences of a large number of funds trying to delever their positions at the same time, taking into account daily market liquidity. The aim would be to determine a liquidity ladder for schemes – a list of assets of decreasing liquidity that could be sold to meet collateral/margin calls in a way that avoided creating a disorderly market.

Only after the crisis (in December 2022) did the [Bank announce it would conduct formal stress tests](#) of leveraged LDI products.

##### **5. Leveraged LDI products should have been allowed to meet collateral/margin calls by pledging assets**

The leveraged LDI products were very poorly designed for pension fund clients. The fact that collateral/margin was in the form of cash instead of pledged assets made a significant difference to the outcome.

What the counterparties to the repo/swap contracts want is the security that they will eventually get paid. It is not critical that they get paid on a daily basis in cash. It would have been perfectly feasible for the pension funds to have pledged other assets in their portfolio, that is, put a 'ring fence' around an agreed set of assets (worth more than 100% of the value of the collateral/margin) which the pension funds could not sell without the permission of the bank counterparty. If such assets could have been pledged, my guess is that the doom loop would not have happened – or would have been much less severe.

The fact that asset-rich organisations like pension funds had to sell assets to pay collateral/margin in cash shows the very poor design of these contracts. Pension fund assets are held by custodians, so there is no risk of pension funds 'running off' with these assets. The assets could be sold off more gradually in due course if needed.

The crisis was over in a couple of weeks (because of the Bank's agreement to buy the bonds that the funds had to sell in an otherwise illiquid market). This cost the pension funds at least £4bn (equal to the Bank's profit from the bail out facility of £18bn). Given that pension funds had to sell something like £70bn in assets in total, the true cost to the pension funds could be a lot more.

There may be a question over whether pledging assets would be permissible under current legislation. This should be checked. But in future, rules should be changed, so that if a disorderly

market is declared, then to avoid it turning into a doom loop, pension funds should be permitted to pledge assets to meet collateral/margin calls.

## **6. The LDI solutions in place in September 2022 were inappropriate given the announced change in government monetary policy in December 2021**

The interest rate hedges that were in place (either in the form of repos or interest rate swaps) were designed to hedge against a fall interest rates. Any rise in interest rates will lead to collateral/margin calls which is what happened in September after the mini-budget. But we have known for some time that interest rates were going to rise (either because of the switch in monetary policy from quantitative easing to quantitative tightening, or because of the increase in inflation resulting from the war in Ukraine); the [Bank of England announced the first rise in interest rates since the pandemic in December 2021](#).

So these hedges were now inappropriate and should have been unwound or even reversed. Had they been reversed, then pension funds would have received collateral payments, not paid them. There was a very serious error of judgement by those advising pension scheme trustees.

It has been argued that that any change in the hedge would have been an attempt by the funds to engage in market timing which would have been equivalent to speculative risk taking, since it is possible that interest rates could have gone even lower – and the whole purpose of the hedging is to avoid risk.

I have three comments:

- The removal or reversal of the hedge would not have been speculation or market timing in this case, since the Bank of England had announced a clear change in policy in December 2021 and investment advisers to the pension funds should have taken this into account.
- An example of market timing would have been trying to guess when the Bank was going to change policy from quantitative easing to quantitative tightening and selling bonds in advance of this to avoid the capital losses associated with the consequential increase in interest rates. Once the announcement was made in December 2021, there was no longer any doubt that interest rates would be on a rising trajectory for some considerable time.
- If the purpose of hedging is to reduce risk (as in the case of currency hedging for example), then leveraged LDI cannot be classified as hedging, since it clearly increases risk (via the leverage and the investment in growth assets, such as equities) and should instead be classified as speculation. I pointed this out in a [letter](#) to the Financial Times on July 6 2022.

## **7. Industry professionals have only limited knowledge and understanding of each other's disciplines**

Pension funding is complex and multi-disciplinary in nature. At least four groups of professionals are involved: actuaries, investment advisers, lawyers and accountants. They are experts in their own fields but have only a limited knowledge and understanding of the other fields.

To illustrate, the actuaries understand pension liabilities and know how to estimate them. But they do not have a deep understanding of investment markets or how investments work. In particular, they did not have a deep understanding of how repos work or the impact of leverage (certainly at a macro level) and pointed to the investment advisers as being the experts on this.

The investment advisers (who recommended the repos and swaps) would have pointed to the lawyers – who would have said that what the investment advisers were suggesting was fine if it satisfied the legal criteria of being a ‘hedge’ or was being used for ‘efficient portfolio management’.

The lawyers would have looked to the accountants for an acknowledgement that all this would pass muster on the financial statements.

The accountants would have turned back to the actuaries with the question: ‘pensions are your area, is all this okay?’. The actuaries would have replied: ‘Well if you are all happy...’. No one looked at the systemic implications.

And why should anyone? Pension funds have never before in history been a cause of systemic financial risk – and none of these professional groups would ever have thought they could be. I would not describe this as trying to pass the buck – but it is an inevitable consequence of the complex and multi-disciplinary nature of pension funding. As one of your panellists [said](#): no one is losing sleep at night because everyone thinks someone else is staying awake and doing the worrying.

The problem is that none of these professional groups has any incentive to learn and understand more about each other’s discipline because of the long-term nature of pension funding. The end customer – the pension scheme member – will not become aware that the ‘product’ they are purchasing – the pension – is any good or not for at least 40 years, by which time these professionals will have retired themselves.

This contrasts with other industries and professional groups, e.g., those involved in commercial aircraft design (such as metallurgists, engine designers, aerodynamic specialists and hydraulic engineers) who have to understand each other’s disciplines for the simple reason that the customer knows whether the product works immediately after take-off.

I tried around 15 years ago to set up an MSc in Pensions at Bayes. It would have covered pension finance and economics, actuarial science, pension law and regulation, and pension accounting. But it failed to take off due to insufficient demand – confirming the point that the pensions industry does not feel the need to bridge the gaps in its knowledge and understanding.

#### **8. LDI solutions that hedge interest rates are only in place because of accounting standards**

Pension accounting standards, such as FRS102 and IAS19, are responsible for encouraging pension funds to hedge interest rates because they require pension schemes to report the present value of the pension liabilities using a recognised discount rate.

There is much confusion over what pension liabilities are – and this has a lot to do with these accounting standards. Pension liabilities are not volatile. They are projected future pension payments – and these did not change at all during the ‘crisis’ period (although will change over time as inflation and mortality assumptions change).

The present value of the liabilities is a different matter – and there is much disagreement over how pension liabilities should be valued. In 2008, I co-authored a report called [‘An Unreal Number. How Company Pension Accounting Fosters an Illusion of Certainty’](#). It explains how pension accounting has evolved both to reflect changing views of the nature of the pension promise and to help fulfil the accounting objectives of stewardship and decision-usefulness. The report contends that the most useful information that accounts can provide about a defined benefit plan’s funded status is the market, or fair, value of its assets and the amounts, timing and uncertainty of its projected pension payments. By reducing this information to a single number (i.e., the discounted present value of the

liabilities), pension accounting standards create an ‘illusion of certainty’ which supplementary cash flow projections and sensitivity analyses do not dispel.

It was this ‘single number’ that in the case of the LDI crisis quite ironically caused far too much short-term ‘uncertainty’ because of fluctuations in the discount rate used to value the liabilities.

But we should remember that the only reason to estimate the present value of the liabilities is to determine the sponsor’s contribution rate. This present value is compared with the market value of the assets so the scheme actuary can calculate what the sponsor’s total contribution rate needs to be to cover the current service cost and to eliminate any deficit over an agreed period.

So rather than report the present value of the liabilities as required by current accounting rules, what could be reported instead is the stream of estimated future liabilities (undiscounted) and the sponsor’s contribution rate (split between the normal contribution and the deficit contribution). This is really what investment analysts and shareholders need to know. It is not helpful to report that the present value of the liabilities has been going up and down like a yoyo because of the volatility in interest rates.

We would not then have had to introduce LDI strategies that attempt to hedge volatile interest rates. Instead we could have more suitable asset-liability management (ALM) strategies in place that recognise that the objective of a pension scheme is to deliver a stream of future cash flows and that this needs suitable matching assets that deliver reliable cash flows (such as bonds, equities paying regular dividends, infrastructure, and real estate). In short, ALM is as essential for pension funds as it is for banks and insurers – as explained in my book [‘Pension Finance’](#) – but it has to be done properly.

**February 2023**