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Gudjónsson, Jón; Hougaard Jensen, Svend E.

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Jon Gudjonsson and Svend E. Hougaard Jensen*

Pension Funds and Financial Stability: The Case of the UK Gilt Crisis

While macroprudential policy has mostly focused on the role of banks, we argue that pension funds are also important for financial stability. Drawing on previous research on pension funds, we explain how their actions can have a vital impact on other financial institutions as well as on households and firms. Using the UK gilt crisis as a case in point, we recommend widening the scope for macroprudential policy to reflect the significance of pension funds for financial stability.

Financial stability and banks

Lessons learned during the past decades, especially in the aftermath of the 2007-2009 global financial crisis, have led academics and policymakers to increasingly recognise the importance of financial stability. Most central banks now include the promotion of financial stability in their mandates, alongside the more traditional goals of price stabilisation and the management of economic fluctuations. In particular, the Basel III regulatory framework and its many adoptions around the world have also given national authorities more extensive tools for this task than ever before.

Although Basel III and the accompanying legal frameworks include tools that apply to many different sectors within the financial system, their main focus is on banks. The inherent mismatch in duration between banks' assets and liabilities makes them very vulnerable to short-term shocks. Also, due to banks' quintessential role as the main financial intermediaries in modern financial systems, they are very likely to transmit shocks to other financial

institutions and the real economy (Baur, 2012; Bekaert et al., 2014; Miranda-Aggrippino and Rey, 2015, 2021).

Banks are the central nodes in large networks of borrowers, savers and other financial institutions. For example, small and mid-sized firms are usually almost entirely reliant on banks for short-term funding – and households depend on banks for consumption loans and mortgages. Furthermore, banks are interconnected by lending to and borrowing from each other in both the short and medium term.

For most shocks, being part of a diversified network allows banks to redistribute the impact throughout the network. This increases the ability of individual banks to absorb shocks, making the financial system more resilient. For very large shocks, however, the interconnectedness of banks can be a disadvantage, since such shocks may be so severe that even when dispersed throughout the network, they may still be too big for many individual banks to endure (Acemoglu et al., 2015; Gai and Kapadia, 2010).

The importance of specific banks within the financial system also varies, with some banks being more central than others and possibly forming their own sub-networks or clusters within the larger network. Such banks have been classified as systemically important in the sense that shocks affecting them will be more contagious, and their spread throughout the network more severe. Basel III addresses this issue by laying out methodologies to identify systemically important banks and proposing frameworks and tools to reduce or limit the systemic risk created by them.

It is no surprise, then, that banks have been the prime focus of financial stability and macroprudential policies. Banks are, by nature, volatile institutions; managing the

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Jon Gudjonsson, Central Bank of Iceland, Reykjavik, Iceland.

Svend E. Hougaard Jensen, Copenhagen Business School, Denmark.

short-term risks faced by banks is important due to their foundational role as one of the main financial intermediators in the economy.

Pension funds and financial stability

Pension fund assets have been increasing steadily during the last decades. At the end of 2021, pension fund assets worldwide amounted to more than US \$38 trillion and in many countries pension fund portfolios constitute a significant portion of GDP (OECD, 2022). Due to the substantial size of their portfolios, pension funds have become more exposed to a widespread selection of different markets and sectors. Yet, pension funds have so far been seen as playing a secondary role in terms of their importance to financial stability.

The prevailing view has been that, due to their long-term outlooks, pension funds are not affected by short-term crises to the same extent as other financial institutions. Pension funds might therefore act as mitigators during crises by injecting much needed liquidity into stagnant asset and equity markets, otherwise their involvement would be limited.

In practice though, pension funds have in many cases been observed to exhibit pro-cyclical behaviour (Bikker et al., 2010; Papaioannou et al., 2013). The main issue here is that even though pension funds' liabilities are mostly long-term, they still have short-term liabilities and funding requirements that they need to satisfy. Indeed, market shocks can cause imbalances in balance sheets and significant reductions in income streams. In response, funds will have to make regular adjustments to their portfolios, and this may require them to follow short-term market fluctuations. For example, during the global financial crisis many pension funds around the world ran into difficulties, which left them underfunded or financially unstable (Impavido and Tower, 2009; Beetsma et al., 2015). During the crisis, many funds also opted to sell off equity, despite rapidly falling prices (Papaioannou et al., 2013).

Pension funds also tend to hold similar assets and make similar adjustments to their portfolios when responding to common shocks. Given the extent of their positions in asset markets, this may lead to price imbalances and reduce market efficiency. Blake et al. (2017) found strong evidence that pension funds exhibit hoarding behaviour, with smaller pension funds emulating the portfolio decisions of larger funds – or similar funds emulating each other. Pennacchi and Rastad (2011) observed hoarding among US pension funds and noted that it could lead to inefficient asset allocations, since funds that emulate others do not usually optimise their portfolios based on

actuarial considerations or liability immunisation. Moreover, while traditionally pension fund participation in equity markets has been viewed as having a stabilising effect (Bohl et al., 2009; Thomas et al., 2014; Babalos and Stavroyiannis, 2020), hoarding by pension funds can still cause noticeable short-term fluctuations in equity markets (Brzezarczyński et al., 2019).

Many pension funds have also scaled up their foreign investments. From a pure portfolio theory standpoint, international investment will increase portfolio diversification, leading to better asset allocations (Davis, 2005; Pfau, 2011). However, the extent of diversification may not be as great as it would seem at first glance. Funds usually have less information on foreign markets than they do on local markets, and their investment decisions may therefore be skewed. This could lead to overinvestment in sectors they are more familiar with from their domestic experiences.

Schumacher (2018) finds that mutual funds exhibit this type of behaviour when investing abroad, being more disposed towards industries that are strong in their home countries. It is not implausible to imagine that this might also be the case for pension funds – which also seem to make more risky choices when investing abroad than at home. For example, Rubbaniy et al. (2014) observe that Dutch pension funds are biased towards equity when investing abroad, while at home they invest more in fixed-income assets.

Foreign investment also exposes funds and domestic financial systems to foreign shocks and cross-country contagion. Due in part to this increased risk, regulatory limits on the foreign investments of pension funds are a common feature around the world (OECD, 2021). However, Cayon and Thorp (2014) find that such limits are not sufficient to isolate countries from international shocks, although they can help reduce contagion to some extent.

Interactions between funds and fund members can also play a crucial role during financial crises since the levels of contributions and benefit payments directly affect household income and savings. For instance, during 2007-2009, financial difficulties among Dutch pension funds forced many of them to increase contributions and reduce benefits, directly impacting households' disposable incomes (Beetsma et al., 2015).

The operational structure of funds plays a key role here: in defined contribution (DC) plans, the benefits received by beneficiaries are determined by how much they have contributed to the plan, and how successfully the fund has managed the contributions. Conversely, in defined benefit (DB) plans, benefits are determined by specific agreed-

upon rules and are mostly independent of the beneficiaries' actual contributions and the fund's asset position.

For beneficiaries of DC plans, a sharp decline in asset returns will reduce the value of pension plans and directly affect the expected lifetime income of households. While the causality for DB plans may not be as clear, severe shocks can still decrease funding ratios to such an extent that DB schemes are forced to respond by reducing planned and/or current benefit payments – or are forced to petition their sponsors for additional capital.

Financial shocks are also commonly followed by periods of increased unemployment, which will negatively affect funds through lower contributions. In some cases, this may also lead to a further deterioration in fund income and assets, for example if the fund has issued loans to fund members who then become unemployed and subsequently default on their obligations.

Overall, while pension funds are by and large less volatile institutions than banks, they are obviously not unaffected by financial shocks. Pension funds are also not isolated entities since, just like banks, they are part of larger networks, which extend through both the financial system and the real economy. This is why pension funds should not be disregarded as a possible source of financial instability. This assessment now appears to be more commonly understood. For example, in 2020 the European Systemic Risk Board published a white paper exploring the implication of pension funds for financial stability (Sánchez Serrano and Peltonen, 2020).¹

The UK gilt crisis

A recent episode also indicating that it may be time to reassess the role of pension funds in regard to financial stability is the narrowly avoided downward spiral in UK treasury bonds in late September 2022.

The UK pension system is the biggest collection of pension schemes in Europe, with assets amounting to about £2.5 trillion and over 44 million members at the start of 2022 (ONS, 2022). One peculiarity of the system is the large number of small occupational pension funds sponsored by small or midsized employers. Frequently, these small funds will pool their asset management by jointly outsourcing it to external asset managers.

¹ Also, a recent expert assessment of the Icelandic central bank during 2020-2022 makes the following recommendation: "The pension system warrants a special focus from a financial stability point of view to better understand under what circumstances pension funds could potentially amplify market volatility and distortions" (Hakkarainen et al., 2023, 48).

Another peculiarity is that, when compared to other European funds, UK funds have a much larger percentage of their assets invested in bonds. This can be traced to a sequence of regulatory changes in the mid-1990s and early 2000s. In 1995, parliament ratified the Pensions Act 1995, which introduced a minimum funding requirement (MFR). This MFR requires that pension funds retain a minimum funding ratio of 90% (funding rates are audited every three years) and if they at some point fail to meet this requirement, they must become fully funded within five years. The rate used to compute the present value of liabilities for the MFR are the yields on long-term UK government bonds (usually referred to as gilts). This has created an incentive for pension funds to invest in gilts since this allows them to match the value of their assets and liabilities more directly (Bank of England, 2014).

This strategy of investing mostly in long-term gilts to match the duration of liabilities and assets has been referred to as liability-driven investment (LDI). Furthermore, the MFR limits the level of future inflation that funds are allowed to assume when calculating present values, which makes indexed gilts a particularly attractive option since they are immune to inflation risk (Douglas and Roberts-Sklar, 2018). By implication, UK pension funds hold a majority stake in the indexed gilt market, with around 70% of funds' gilts being indexed at the end of Q1 2022 (ONS, 2022).

However, LDI strategies are quite expensive given that government bonds usually carry limited returns compared to most other asset classes. This became a problem for pension funds in the aftermath of the 2007-2008 global financial crisis, when the Bank of England started an extensive quantitative easing programme. This intervention increased the price of long-term gilts, thereby decreasing their yields and making LDI even more expensive than before.

Furthermore, quantitative easing had a larger impact on funds' liabilities than on their assets. In 2011, the National Association of Pension Funds (NAPF) estimated that for each 0.1% future reduction in gilt yields, pension fund liabilities would grow by 2%, whereas assets would only grow by 0.4% (NAPF, 2011). This created an incentive for funds to look for ways to increase the returns on their assets to keep themselves above funding requirements.

Pension funds therefore started to use repos and derivatives to increase their short-term borrowing in order to buy even more gilts. This way they could benefit from interest rate differences and at the same time increase their total returns, since short-term rates were much lower than long-term rates. However, this strategy was reliant on

short-term rates staying low in the foreseeable future and increased funds' leverage (Clacher and Keating, 2022). Although there were some concerns, the increase in short-term leverage was believed to be insubstantial given that gilt yields would have to increase considerably before these arrangements became unsustainable. The systemic risk arising from these arrangements was also considered to be limited due to the improbability of large fluctuations in gilt yields² and the inherent stability of pension funds.

Things came to a head at the end of September 2022, when the newly established government of Prime Minister Truss revealed a fiscal plan which, among other things, promised extensive tax cuts. The plan also included large aid packages to help households and firms deal with inflation, which would be financed by more than £70 billion of new government debt (HM Treasury, 2022).

This plan was met with heavy criticism since the government was already dealing with large deficits. Markets also reacted negatively with Sterling depreciating considerably and gilt prices falling sharply. As a result, yields on 30-year bonds rose by 80 basis points between the morning of Friday, 23 September, when the plan was announced, and the following Monday. Market conditions improved marginally early on 27 September, but then quickly deteriorated again before the Bank of England was forced to step in to stabilise the situation (Bank of England, 2022a).

The increase in gilt yields had a twofold effect on pension funds. Firstly, the increase reduced the present value of their liabilities, improving their positions and funding ratios. On the other hand, the drop in gilt prices deteriorated funds' asset positions and, more importantly, reduced the value of the collateral used to cover short-term borrowing through repos and derivatives. Fund asset managers were then issued with margin calls and asked their funds for additional capital in response.

However, many funds were slow to respond to these requests, especially the smaller ones with pooled asset management (Bank of England, 2022a). As a result, managers were forced to sell gilts in order to raise short-term capital, leading to a further deterioration in gilt prices. Had this been allowed to go on, it would likely have set in motion additional margin calls, followed by more gilt sales and so on, before eventually crashing the entire gilt market.

2 For example, in 2018 the Bank of England simulated the effects of interest rate shocks on UK funds and found that an interest increase of more than 100 basis points (depending on the strength of each fund) was needed before funds might possibly start selling assets in any material quantities (Douglas and Robers-Sklar, 2018).

As stated above, this fire-sale spiral was only avoided thanks to the intervention of the Bank of England, which committed more than £100 billion³ to buying long-term gilts between 28 September and 14 October (Bank of England, 2022c, 2022d). In response to this intervention, gilt yields fell rapidly, although they then started to increase again until 11 October when the Bank of England was forced to also start buying indexed gilts, which it had historically not done before.

After the wind-down of the Bank of England's original intervention another temporary programme followed, which was to ensure LDI fund liquidity until at least 10 November (Bank of England, 2022c). Pension fund losses due to this episode are not clear and may perhaps never be fully determined, although in their testimony before a parliamentary committee, Clacher and Keating (2022) estimate the asset losses to be at least £500 billion.

Concluding remarks

The UK gilt crisis clearly shows that the presence of pension funds in some markets has become large enough that their short-term decisions can have serious repercussions. This directly relates to the fact that while pension funds are traditionally long-term oriented in terms of investments, there are numerous situations in which they are forced to make short-term adjustments. These can arise due to sudden market fluctuations or because regulators or policymakers may have inadvertently forced funds towards short-term leverage, as was the case in the UK.

Devising regulations for institutions that have become such important entities in financial markets also brings with it added risks due to the possible hoarding behaviour of funds. Likewise, pension funds are important players not only in financial markets but also in the real economy. Pensioners rely on them for income, and contributors trust that their contributions will eventually allow them to retire.

In sum, when pension funds are negatively impacted by shocks, there is the possibility that these shocks will affect household income and saving decisions. Thus, the issue of pension funds and their role in financial stability is bound to be of increasing interest, especially as the importance of pension funds in the world's financial system is only expected to grow in the foreseeable future.

3 To put this amount into perspective, at the end of February 2022 the Bank of England's total assets amounted to around £1,130 billion (Bank of England, 2022b).

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