LEVERAGE AND LIQUIDITY: UNRAVELING THE 2022 U.K. PENSION CRISIS

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Introduction

Pensions are often an afterthought to the average person. But in late 2022, aspects of financing the occupational pension fund market shook the foundations of the United Kingdom's economy, requiring a bailout by the Bank of England ("BoE"). That episode triggered the need for an investigation into the inner workings of the financing of private pensions, and requires better understanding. This note is a study of that episode.

Pensions in general are mechanisms by which to provide income security after retirement.[1] Historically, there have been generally three sources of retirement income security: (1) some type of government pension system, (2) a retirement program offered by private employers

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[1] *See generally What is a Pension? Types of Plans and Taxation*, INVESTOPEDIA, https://www.investopedia.com/terms/p/pensionplan.asp [https://perma.cc/DM36-PD6K] (last updated May 5, 2023).

("private", or "occupational" pensions),[2] and (3) personal savings. In the United States ("U.S."), the Social Security system is the principal government pension.[3] During a person's working life, she pays Social Security taxes based on her income, which go into a trust fund that distributes monthly payments to retirees and their families.[4] In the United Kingdom ("U.K."), the government issues a State Pension.[5] Both systems pay out to retirees who made some minimum amount of tax contributions during their working lives.[6] The State Pension requires a minimum number of National Insurance ("NI") contributions, while Social Security requires a minimum number of Social Security credits, which are earned when one works and pays Social Security taxes.[7] Plans offered by employers take two main forms, defined benefit and defined contribution plans. Defined benefit plans promise a recurring periodic benefit to the retired beneficiary.[8] A defined contribution plan, in contrast, takes the form of employee (and often, employer) contributions to an account held for the exclusive benefit of an employee.[9] In both the U.K, and the U.S., occupational pensions have historically been defined benefit plans, though in the past 40 years there has been a substantial shift from defined benefit to defined contribution plans, due in large part to the difficulties of administering and meeting the demands and fulfilling the promises of defined benefit plans.[10]

In September 2022, defined benefit plans experienced financial shocks bordering on meltdown. On September 23rd, Former Prime Minister Liz Truss, then still in office, announced that her administration

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[2] *See generally Sources of Retirement Income*, FIN. INDUS. REGUL. AUTH., https://www.finra.org/investors/learn-to-invest/types-investments/retirement/managing-retirement-income/sources-retirement-income [https://perma.cc/XXC6-YUXK].
[3] *Id.*
[4] UNDERSTANDING THE BENEFITS, SOC. SEC. ADMIN. (2023), https://www.ssa.gov/pubs/EN-05-10024.pdf [https://perma.cc/LX9D-JZ44].
[5] *The State Pension*, PENSION ACCESS, https://pensionaccess.co.uk/discovery/types-of-pensions/the-state-pension/ [https://perma.cc/R49H-VWJT].
[6] *Id.*; SOC. SEC. ADMIN, *supra* note 4.
[7] *Id.*; SOC. SEC. ADMIN, *supra* note 4.
[8] *Types of Retirement Plans*, U.S. DEP'T OF LABOR, https://www.dol.gov/general/topic/retirement/typesofplans [https://perma.cc/S7CM-HPEC].
[9] *Id.*
[10] *The Shift from Defined Benefit to Defined Contribution*, PENSIONS POL'Y INST. (July 2003), https://www.pensionspolicyinstitute.org.uk/media/2425/200307-bn02-the-shift-from-db-to-dc.pdf [https://perma.cc/SK64-7XYX].

planned to abolish the 45% income tax rate of the U.K.'s highest earners, among other tax cuts and deregulation policies,[11] as a response to the stagnation in the country.[12] After the announcement, several effects rippled across markets and regions: the pound fell in value against the dollar (to near parity);[13] yields on bonds spiked as bond prices fell;[14] as yields on bonds increased, asset managers overseeing the holdings of defined benefit pension funds ("DB funds") called for plan sponsors to post additional collateral to secure loans previously taken out by the plans to finance additional investment and secured by existing plan assets; and as asset managers pressed for added collateral, the seemingly stable world of DB funds was put in the position of having to liquidate remaining plan assets to remain afloat.[15] The vulnerability of U.K. pensions was not always as pronounced, but the signs of impending doom were there.

As discussed in more detail in Part II, DB funds evolved their investment strategy multiple times. The funds historically had invested principally in equities for their higher long-term returns.[16] Towards the end of the 20th century, in part because of the volatility of equities and in part because of changes in accounting standards, their investments

[11] Eshe Nelson, Stephen Castle & Mark Landler, *U.K. Government Goes Full Tilt on Tax Cuts and Free-Market Economics*, N.Y. TIMES, Sept. 23, 2022, at A1 ("Against that fraught backdrop, the new chancellor of the Exchequer, Kwasi Kwarteng, abandoned a proposed rise in corporate taxation and, in a surprise move, also abolished the top rate of 45 percent of income tax applied to those earning more than 150,000 pounds, or about $164,000, a year.").

[12] *Id.* ("[Kwarteng] acknowledged that 'none of this is going to happen overnight,' but said that the focus on tax cuts 'is how we will turn this vicious cycle of stagnation into a virtuous cycle of growth.'")

[13] Eshe Nelson, *Pound Flirts with a Low, Jolting U.K.*, N.Y. TIMES, Sept. 26, 2022, at B1 ("In the end, statements from the central bank and the government offered little relief to markets, where there are growing expectations that the pound could reach parity—a one-for-one exchange rate—with the dollar soon, a thought that was almost inconceivable a few months ago.").

[14] Joe Rennison, *British Borrowers Face Up to a Broken Mortgage Market*, N.Y. TIMES, Sept. 30, 2022 at B1 ("Prices move inversely to bond yields. Within 30 minutes of the British government's announcement, the yield on 30-year government bonds, also known as gilts, soared, moving more than it typically does in a full day.").

[15] *Id.* ("The asset managers who oversee the holdings of pension funds began asking them for more cash to cover the change in value.").

[16] *See infra* Section I(B)(4).

had shifted over time from equities to debt,[17] including long-dated, inflation-index linked government bonds ("gilts"), which HM Treasury had began issuing for the benefit of pension plans in 1981.[18] The shift to debt (including long-dated gilts) permitted the plans to match the maturation of plan investments with projected liabilities, a strategy that came to be known as liability-driven investment ("LDI").[19]

The shift from equities to debt, while reducing volatility, though, also reduced the returns from plan investments.[20] The need to supplement the returns to plan assets was exacerbated, which led to a need to boost yields in the wake of the Global Financial Crisis of 2008.[21] In the post-crisis environment of low interest rates, DB funds' ratio of assets to liabilities suffered.[22] When low interest rates increased the present value of plan liabilities more than it increased plan assets, funds found themselves in deficit.[23] Around the same time, there developed an increasing pattern of liability hedging by DB funds.[24] While funds held long-dated gilts, they also borrowed against some fraction of them to

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[17] Graeme Douglas & Matt Roberts-Sklar, *Staff Working Paper No. 757: What Drives UK Defined Benefit Pension Funds' Investment Behavior*, BANK OF ENGLAND 1 (Oct. 2018), https://www.bankofengland.co.uk/-/media/boe/files/working-paper/2018/what-drives-uk-defined-benefit-pension-funds-investment-behaviour.pdf [https://perma.cc/ZC5J-5JDM] ("Over the same period, DB pension funds have materially shifted their asset holdings from equities to bonds. Having held 61.1% of assets in equities and 28.3% in bonds pre-crisis, by 2017 these proportions changed to 29.0% and 55.7%, respectively.").

[18] U.K. DEBT MGMT. OFF., *infra* note 77.

[19] HOUSE OF COMMONS WORK AND PENSION COMM., DEFINED BENEFIT PENSIONS WITH LIABILITY DRIVEN INVESTMENTS, SEVENTH REPORT OF SESSION 2022-23, HC 826, at 13 (UK) [hereinafter HC 826].

[20] *Id.*

[21] Douglas & Roberts-Sklar, *supra* note 17 ("Since the crisis, the low interest rate environment, together with other factors, has led to a deterioration in UK DB pension funds' funding ratios – these are, the ratios of their pension assets to liabilities.").

[22] *Id.*

[23] *Id.*

[24] Paul Richmond, *Seeking New Sources of Repo Liquidity*, PENSIONS MANAGEMENT INST. (Nov. 13, 2020), https://www.pensions-pmi.org.uk/knowledge/pensions-aspects-magazine/seeking-new-sources-of-repoliquidity/#:~:text=In%20a%20traditional%20repo%2C%20the,price%20on%20an%20agreed%20date. [https://perma.cc/NP2J-86CH] (referencing Figure 1).

make more risky, typically derivative, investments.[25] When the Truss-induced crisis caused prices to fall, the reduction in collateral increased the funds' leverage, leading to margin calls for increased collateral.[26] Far from benefitting from the increase in yields, fund managers were forced to liquidate long-dated gilts, prices of which were already depressed, to post the needed collateral, further depressing prices, exacerbating their already deteriorated ratios of assets to liabilities.[27]

Part I will discuss the background of pension plans, including its history in the U.K on the public and private side. It will go into the difference between defined benefit and defined contribution plans, as well as the trend toward the use of defined contribution plans. It will also discuss the origins of LDI. Part II will explore the prevalence of LDI in the pension industry. It will also describe how the investment strategy began as a way for fund managers to insulate plan liabilities on balance sheets and evolved into a yield-enhancing strategy using leverage. Part III will return to the current issue, first contextualized in the introduction. It will also discuss the involvement of BoE and its bailout plan. Part IV will discuss lessons learned and potential solutions to the crisis. Part V will investigate the potential for a similar pension-based crash in the United States ("U.S.") and Part VI of this note will conclude by assessing the future for the U.K. pension market.

I. Background

The history of pensions in the U.K. involves the evolution of both the public state pension and private employer-provided pension.

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[25] *Bank Staff Paper: LDI Minimum Resilience – Recommendation and Explainer*, BANK OF ENGLAND (Mar. 29, 2023), https://www.bankofengland.co.uk/financial-policy-summary-and-record/2023/bank-staff-paper-ldi-minimum-resilience [https://perma.cc/6HNE-6E8E] [hereinafter *Bank Staff Paper*].

[26] *Id.* ("This caused significant falls in the prices of long-dated gilts held by liability-driven investment (LDI) funds (in this document, 'LDI funds' refers to leveraged LDI funds and LDI mandates), which pushed up their leverage and resulted in the funds having to post additional collateral on their secured borrowing or pay margin calls on derivatives. To meet margin and collateral calls, as well as reduce leverage, LDI funds had to rebalance their portfolios sharply by selling liquid assets or asking their defined benefit pension scheme investors to provide more collateral.").

[27] *Id.* ("Forced deleveraging into an illiquid market risked reinforcing the downward pressure on gilt prices.").

A. Public Pensions

In 1908, the Old Age Pensions Act provided the first state pension, using funds from taxation and distributing five shillings a week to those who made less than 21 pounds a year.[28] Then, the National Insurance Act of 1946 introduced the basic state pension ("BSP"), replacing the 1908 scheme with a contributory system, where individuals paid contributions that would fund current pensioners.[29] BSP pays individuals on a weekly basis if they qualify based on their age and have made some minimum number of National Insurance ("NI") contributions.[30] In 1978, the Social Security Pensions Act introduced earnings-related benefits known as the "State Earnings-Related Pension Scheme" (SERPS), which called for pensions to average the "highest-earning 20 years of the working life."[31] SERPS functioned as a top-up to BSP, but was not mandatory, so employees working in the public sector could opt-out of SERPS and contribute less to NI.[32] The extra funds could then be invested in a private pension.[33] The Social Security Act of 1980, though, abolished the earnings-related supplement.[34] SERPS was officially replaced in 2002 by the State Second Pension Scheme ("S2P"),

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[28] In 2024, five shillings is approximately 45 pounds and 21 pounds in 1908 is about 3,166 pounds now. Djuna Thurley, *Old Age Pensions Act 1908*, HOUSE OF COMMONS LIBRARY (Aug. 12, 2008), https://commonslibrary.parliament.uk/research-briefings/sn04817/ [https://perma.cc/H8XM-SX2V].

[29] ANTOINE BOZIO, ROWENA CRAWFORD, & GEMMA TETLOW, THE HISTORY OF STATE PENSIONS IN THE UK: 1948 TO 2010 (IFS BRIEFING NOTE BN105), AT 8, INST. FOR FISCAL STUD. (2010).

[30] *Id.* at 12.

[31] SOCIAL SECURITY COMMITTEE, ANNEX A: SUMMARY OF KEY LEGISLATION AND THE MAJOR CHANGES TO SOCIAL SECURITY, 1999 (UK), https://publications.parliament.uk/pa/cm199900/cmselect/cmsocsec/56/9112407.htm#:~:text=Social%20Security%20Pensions%20Act.,years%20of%20the%20working%20life [https://perma.cc/JX4L-YWKC].

[32] Carina Chambers, *What is a SERPS Pension?*, PROFILE PENSIONS (Jan. 11, 2023), https://www.profilepensions.co.uk/blogs/what-is-serps#:~:text=SERPS%20was%20introduced%20in%201978,Class%201%20National%20Insurance%20Contributions [https://perma.cc/8QDD-M537].

[33] *Id.*

[34] John Mesher, *The 1980 Social Security Legislation: The Great Welfare State Chainsaw Massacre?*, 8 BRITISH J. OF L. & SOC'Y 119 (1981) (describing changes from 1978 and 1980 Social Security Acts and its implication on the welfare state).

which was also a top-up program, until it too ended in 2016.[35] A special provision was also made for the lowest-income workers. In 1999, the government introduced the Minimum Income Guarantee.[36] That was replaced by the Pension Credit in 2003, which provides extra support for living expenses for those with low income to this day.[37] The latest iteration of the state pension arrived in 2016, when the U.K. launched its flat-rate, single-tier State Pension.[38] To qualify for the full amount, which is £203.85 per week in 2023, one must have made a minimum of 35 years of NI contributions.[39] The post-2016 State Pension differs from S2P in that certain exceptions, such as extra support based on NI contributions of a spouse, or additional pension top-ups based on income, were no longer allowed.[40]

With respect to private savings and occupational pensions, the U.K. also introduced a number of legislative innovations. In 1988 it created tax-advantaged personal pensions, for individuals without occupational pensions.[41] In 2004, it introduced two protection mechanisms for those with occupational pensions.[42] It created the Pensions Regulator ("TPR"), an agency that could intervene if a company's officers were not adequately supporting a pension scheme, and the Pension Protection Fund, which provides benefits to beneficiaries of funds whose employer-sponsors become insolvent.[43] TPR is sponsored by the Depart-

[35] *The Pension Timeline*, PENSION ACCESS, https://pensionaccess.co.uk/the-pension-timeline/ [https://perma.cc/98DB-TFDD] (last updated Mar. 2022).
[36] *Id.*
[37] *Pension Credit*, GOV.UK, https://www.gov.uk/pension-credit [https://perma.cc/YG85-X6BB].
[38] *State Pension: How and When You Can Claim*, AGE UK (2023), https://www.ageuk.org.uk/globalassets/age-uk/documents/information-guides/ageukig53_state_pension_inf.pdf [https://perma.cc/ZKN7-YD42].
[39] *Id.*
[40] *Id.*
[41] *Overview of the UK Pension System*, HM TREASURY 1, 3 (Dec. 2014), https://economic-policy-committee.europa.eu/sites/default/files/docs/pages/united_kingdom_-_country_fiche_on_pensions.pdf [https://perma.cc/36BH-WGKU].
[42] PENSION ACCESS, *supra* note 35.
[43] *Id.*; PENSION PROTECTION FUND, https://ppf.co.uk/ [https://perma.cc/9U2B-VZZH].

ment of Work and Pensions and issues annual reports on pension accounts.[44] In 2012, U.K. initiated auto-enrollment, meaning that every employer in the U.K. was required to enroll qualifying employees into a pension scheme.[45] Employees could opt-out and there was no contribution mandate, but auto-enrollment ensured that company pension schemes were at least available to qualified employees.[46]

B. Private Pensions

Public pensions like the U.K. State Pension (and U.S. Social Security) are defined benefit plans. Private pensions can take the form of either defined benefit or defined contribution plans. Although "pensions" historically took the form of defined benefit plans, the last 40 years have witnessed a dramatic shift to defined contribution plans.[47] Defined contribution plans relieve employer-sponsors of the responsibilities and risks of administering arrangements that entail the payment of benefits promised years into the future. The desire to avoid such responsibilities has led to a market exit out of defined benefit plans and into defined contribution plans.[48] Defined benefit plan liabilities, for which the sponsoring companies are ultimately responsible, have come

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[44] The American equivalent of the Pensions Regulator is the Pension Benefit Guaranty Corporation ("PBGC"). The PBGC was created in 1974 to regulate private defined benefit pension plans, much like the mission of the Pensions Regulator in the U.K. *What We Do and Who We Are*, THE PENSIONS REGUL., https://www.thepensionsregulator.gov.uk/en/about-us/what-tpr-does-and-who-we-are [https://perma.cc/Y8KL-RD8X]; *Who We Are*, PENSION BENEFIT GUARANTY CORP., https://www.pbgc.gov/about/who-we-are#:~:text=The%20Pension%20Benefit%20Guaranty%20Corporation,salary%20and%20years%20of%20service [https://perma.cc/7LWD-8UCB] (last updated Nov. 17, 2023).

[45] PENSION ACCESS, *supra* note 35.

[46] *Id.*

[47] *Workplace pensions: occupational pension schemes and group personal pension schemes explained*, MONEYHELPER, https://www.moneyhelper.org.uk/en/pensions-and-retirement/pensions-basics/workplace-pensions#defined-benefit-pensions [https://perma.cc/TG7Y-W7L9].

[48] Amin Rajan, *The black hole in retirement plans in deep, dark and scary*, FIN. TIMES, Dec. 6, 2017 ("Pensions and Lifetime Savings Association warned that about 3m — out of its 11m [private defined benefit] members in the UK — have only a 50 per cent chance of seeing their retirement benefits paid in full.").

to be treated as balance sheet liabilities of the sponsors.[49] The trend away from defined benefit plans is not confined to the U.K., as countries in which employers traditionally relied on defined benefit plans, like Canada, Japan, and the Netherlands, have also been making the move to defined contribution plans.[50]

1. The Simplicity of Defined Contribution Plans

A defined contribution plan relieves plan sponsors of most of these concerns. It does not guarantee payment of some periodic payment throughout retirement. Instead, as its name implies, it consists of contributions to accounts, separately maintained for each participant beneficiary of the plan. Each beneficiary succeeds to the balance in her account at retirement, at which point the sponsor's responsibility to that beneficiary essentially ends.[51] Because there is no promise of a benefit, the individual, not the company, usually decides how to invest their money.[52] The employee receives the balance of the investment when she retires.[53] This removes the employers' burden of having to gather the funds when it is time to pay out, which becomes more difficult when the company is experiencing a downturn, or impossible if the company is insolvent.[54] In a typical defined contribution plan set up by the employer, the employee chooses how much he wants to contribute and the

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[49] John Ralfe, Cliff Speed, & Jon Palin, *Pensions and Capital Structure: Why Hold Equities in the Pension Fund?*, 8 NORTH AMERICAN ACTUARIAL J. 103, 104 (2004) ("Pension liabilities are economic liabilities of the company, not the pension plan, as the company has to make good shortfalls in the pension plan."); *see* Section II.

[50] Rajan, *supra* note 48 ("Even in hitherto rock-solid DB markets such as Canada, Japan and the Netherlands, all retirement risks are being gradually offloaded on to employees.").

[51] *Defined contribution pension schemes*, MoneyHelper, https://www.moneyhelper.org.uk/en/pensions-and-retirement/pensions-basics/defined-contribution-pension-schemes [https://perma.cc/DJ5B-3ZU6].

[52] *Id.*

[53] In the U.K., up to 25% of the account may be taken as a one-time tax-free lump sum. After that, the retiree may choose to use the rest of the pension funds in the form of an annuity contract, flexible retirement income, or numerous (taxed) lump sums. *See id.*

[54] John Gething & Robert Ling, *Lightening the Load of UK Defined Benefit Pensions*, MARSH MCLENNAN, https://www.marshmclennan.com/insights/publications/2021/april-/lightening-the-load-of-uk-defined-benefit-

employer's plans specify how much (if any) they contribute.[55] The employee then chooses where and how to invest the funds.[56]

2. *The Challenges of Defined Benefit Plans*

A defined benefit plan, what is traditionally thought of as a "pension," is, as its name likewise implies, distinguished by what it promises to the retiree.[57] Such plans characteristically guarantee a contractually stipulated amount, payable periodically, usually for life, to the beneficiary beginning at retirement.[58] The amounts promised vary; they may be a fixed amount; but they are often a specified percentage of the beneficiary's compensation during some prescribed period of employment. There is considerable variation in such arrangements.[59] Due to inherent uncertainties in human longevity, projecting the burden of

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pensions.html [https://perma.cc/9Y9R-62FW] ("The crux of the issue is the vastly different costs of paying members' benefits depending on whether the sponsoring company is solvent or not. While the sponsor is in good financial health, the scheme typically invests in a mix of government bonds, corporate bonds, and equities, and some allowance is made for the expected returns on those assets…However if the sponsor goes insolvent, the pension trustees must try to secure those benefits with an external provider, which typically makes little allowance for returns above government bonds.").

[55] MoneyHelper, *supra* note 51 ("This is a type of pension where the amount you get when you retire depends on how much you put in and how much this money grows. Your pension pot is built up from your contributions and your employer's contributions (if applicable) plus investment returns and tax relief.").

[56] *Id.* ("The fund is usually invested in stocks and shares, along with other investments, with the aim of growing the fund over the years before you retire. You usually choose from a range of funds to invest in.").

[57] *Defined benefit (or final salary) pensions schemes explained*, MONEYHELPER, https://www.moneyhelper.org.uk/en/pensions-and-retirement/pensions-basics/defined-benefit-or-final-salary-pensions-schemes-explained#:~:text=A%20defined%20benefit%20(DB)%20pension%20scheme%20is%20one%20where%20the,year%20in%20line%20with%20inflation [https://perma.cc/J4U7-PQG2].

[58] *Id.*

[59] The amount paid depends on whether the employer offers a final salary scheme or a career average scheme. In final salary schemes, the pension value is based on how much the employee was paid when he retired (e.g. 40% of average salary during the last five years of employment). In career average schemes, the pension value is based on the average salary throughout the employee's career. *Id.*

liabilities ultimately to be paid under defined benefit plans is a daunting task.

These difficulties are complicated by the fact that pension benefits are funded over time, and require the company to estimate the rates of return it might earn and should use in discounting to present value the future plan liabilities and ascertaining how much the company must set aside year-to-year sufficient to pay the benefits promised to the pensioners when they retire.[60] Furthermore, responsibility for managing the assets held to meet liabilities under a defined benefit plans rest with the employer or by someone engaged by the employer.[61] This combination of considerations imposes on employer-sponsors of defined benefit plans responsibility for projecting plan benefits, funding those benefits, and investing the plan assets in a manner that will permit it to satisfy its obligations when as employees retire.[62] The private employer shoulders all the responsibility for providing for the streams of potential liabilities, including the risk that accompanies the duty.[63] In the event of a default, the Pensions Regulator (U.K.) or the PBGC (U.S.) becomes the administrator of the plan.[64] Due to the complexities of administering defined benefit plans, employers across the world have either closed membership to those plans or replaced their retirement benefits with defined contribution plans.[65]

3. The Shift from Defined Benefit to Defined Contribution Plans

That shift has been dramatic in the U.K. Defined contribution plans have grown rapidly in popularity in the U.K., having become the predominant plan type by 2019, with a 27.7% workplace participation rate, compared to 26.8% participation in defined benefit plans.[66] By

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[60] *Id.*
[61] *Id.*
[62] *Id.*
[63] *Id.*
[64] PENSION PROTECTION FUND, *supra* note 43.
[65] James McWhinney, *The Demise of the Defined-Benefit Plan and What Replaced It*, Investopedia, https://www.investopedia.com/articles/retirement/06/demiseofdbplan.asp [https://perma.cc/EBH6-YK3C].
[66] Alpi Patel, *Employee workplace pensions in the UK: 2021 provisional and 2020 final results*, OFF. FOR NAT'L STATISTICS (Apr. 20, 2022), https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/workplacepensions/bulletins/annualsurveyofhoursandearningspensiontables/2021pr

2021, the Annual Survey of Hours and Earnings revealed provisional results of 28.9% of employees participating in occupational defined contribution plans, and 28.2% in defined benefit plans.[67] Although private defined benefit plans have steadily become less prevalent, efforts to transition public pensions like U.S. Social Security to a private defined contribution program have met with little success.[68] Thus, defined benefit plans will continue to exist, even if they are increasingly avoided by private employers.[69] Despite that shift, the aggregate magnitude of the assets held to satisfy projected liabilities under defined benefit plans continue to dwarf those in defined contribution plans.[70] What is more, the beneficiaries of defined contribution plans were not directly affected by Liz Truss's announcement. When the September 2022 crisis hit, it was the "$1.5 trillion defined-benefit pension industry that came into focus."[71] That brought into focus the investment practices of defined benefit plan administrators as they have evolved over the past 40 years.

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ovisionaland2020finalresults [https://perma.cc/8Z9A-9BU4] ("Increased participation in occupational defined contributions (DC) pensions is the main contributor to overall growth in workplace pension participation since 2012.").

[67] An additional 20.8% have group personal, stakeholder, or self-invested personal pensions. *Id.* ("Prior to 2019, occupational defined benefit (DB) pensions were the dominant pension among employees. However, it has seen limited growth, including a small decline over the past decade…This was driven by increased employment in the public sector, as the NHS and civil service responded to the coronavirus (COVID-19) pandemic.").

[68] *See* William A. Galston, *Why the 2005 Social Security Initiative Failed, and What it Means for the Future*, BROOKINGS (Sep. 21, 2007), https://www.brookings.edu/articles/why-the-2005-social-security-initiative-failed-and-what-it-means-for-the-future/ [https://perma.cc/6PMR-NB5E] ("It soon became apparent that it would be a tough sell. Within weeks, observers noticed that the more the President talked about Social Security, the more support for his plan declined.").

[69] *But see* Jeff Sommer, *IBM Reconsiders Pensions, and Reaps the Benefits*, N.Y. TIMES, Feb. 11, 2024 at BU3 ("Last month, IBM thawed out a defined benefit pension plan that it had frozen more than 15 years ago. The company also stopped making contributions into employee 401(k) accounts.").

[70] HC 826, *supra* note 19 at 9 ("[Defined benefit plans] are significant in size, with around £1.4 trillion assets under management. This compares to £213 billion for defined contribution (DC) schemes in the third quarter of 2022.").

[71] Rennison, *supra* note 14.

4. Defined Benefit Plan Investments

Defined benefit plans in the U.K. have shifted strategies when the returns were not looking promising for their liabilities.[72] From investing mostly in bonds/index-linked gilts to switching to equity-based investing and finally to an LDI strategy, DB funds have spent the last forty years trying to ensure that the funds can pay benefits as promised. Index-linked gilts were introduced in 1981 and are government securities indexed to price.[73] The bonds were issued by HM Treasury and carry semi-annual coupon payments and principal payments adjusted to the U.K. Retail Prices Index ("RPI") with a lag.[74] Countries like Australia, Mexico, and Canada continued the trend of issuing index-linked financial instruments throughout the 1980s and 1990s.[75] The success of index-linked gilts in the U.K. was due to its adoption by the pension market, because they provided "protection from unanticipated inflation," which was more important for pensioners than active workers.[76] Index-linked gilts were originally sold exclusively to UK pensions.[77]

Pension funds did not, however, always invest in gilts. During the period 1963-2003, U.S. and U.K. funds invested most of their assets in equities.[78] Since then, though, DB funds have returned to a more debt-

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[72] Phillp Inman & Tony Levene, *Boots gives shares marching orders*, GUARDIAN, Nov. 3, 2001 ("The scheme runs a final salary scheme and trustees need to ensure they can pay pensions to staff who retire over the next 15 to 20 years.").
[73] Michael J. Oliver & Janette Rutterford, *'The capital market is dead': the difficult birth of index-linked gilts in the UK*, 73 ECON. HIST. REV. 258 (2020) ("In the 1981 Budget, Chancellor Geoffrey Howe announced the first issuance of index-linked gilts (that is, government securities adjusted in line with movements in inflation), which were eligible for purchase by UK pension and life assurance companies.").
[74] *About Gilts*, U.K. DEBT MGMT. OFF., https://www.dmo.gov.uk /responsibilities/gilt-market/about-gilts/ [https://perma.cc/6K5D-G9GE].
[75] Oliver & Rutterford, *supra* note 73.
[76] *Id.* at 266.
[77] HYMANS ROBERTSON & NOMURA, THE AGE OF PEAK LDI, 7 (2018).
[78] Ralfe, Speed, & Palin, *supra* note 49 at 103 ("For the last 40 years US and UK pension funds have invested the majority of their assets in equities: the average equity allocation for a UK pension fund in 2002 was 73% (Hewit Bacon & Hoodrow *Pensions Pocket Book* 2003).").

oriented investment strategy.[79] Those in favor of equities argue that equities "match salary related liabilities" and outperform bonds in the long run.[80] While the latter may be true, supporters of debt investment argue that equities are also riskier than bonds, risk that continues to increase over time, though that does not necessarily mean that the fund will do worse over time.[81] The choice to adopt an equity- or debt-preferred strategy seems to depend on how the DB fund is performing.[82] In 2001, twenty years after the introduction of index-linked gilts, the market saw pension schemes like that of Boots Company, a large pharmaceutical retail chain in the U.K., start to return to government bonds and pull out of investing in shares.[83] John Ralfe, Head of Corporate Finance at Boots at the time, said that the switch to bonds reduced Boots' financial risk by matching the pension assets and liabilities and increased security for pension members, among other benefits.[84] It also made logical sense to tie the company's long-term pension contributions to long-term bonds.[85] Ralfe argued that the move to bonds meant less risk for the company's shareholders, because it lowered the "risk of a future pension deficit which would require higher company contributions."[86] There was also

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[79] *Study on the Drivers of Investments in Equity by Insurers and Pension Funds*, EUROPEAN COMM'N (Apr. 2019), https://ec.europa.eu/financee/docs/policy/191216-insurers-pension-funds-investments-in-equity/pension-funds/factsheet-uk_en.pdf

[80] Ralfe, Speed, & Palin, *supra* note 49 at 103-104 ("Equities are considered to match salary related liabilities and thus allow pension assets to grow in line with pension liabilities…Equities outperform bonds in the long run.").

[81] Variance in returns increase as we look at a longer period of time. *Id*. at 104 ("The risk of an equity portfolio *increases* over time.").

[82] Douglas & Roberts-Sklar, *supra* note 17 at 3 ("Rauh (2009) finds that pension schemes in deficit invest a greater percentage of their assets in safe investments (government bonds and cash), and better funded pension schemes invest a greater percentage in equities.").

[83] Inman & Levene, *supra* note 72 ("Boots Pension Scheme has pulled out of shares, putting the entire £2.3bn fund in supersafe bonds issued by governments and state-backed bodies.").

[84] John Ralfe, *Making the Switch to Bonds*, TREASURER 20, 20 (2001) ("Boots' shift from equities to matching bonds addresses these risks and is positive for the company's shareholders, bondholders and pension scheme members because: it reduces Boots financial risk by matching pension assets and liabilities…it increase[s] security for pension scheme members.").

[85] *Id.* (". . . it fixes Boots' long-term contributions at their current level. Moving to 100%-matched bonds locks in a surplus of assets over accrued pension liabilities.").

[86] Ralfe, Speed, & Palin, *supra* note 49 at 111-112.

no longer the risk of relying on the performance of equities for pensioners.[87] While investing in equities seemed to work in the bull markets of the 1980s and 1990s, the strategy no longer functioned as well in the early 2000s, when new regulations demanding more reporting exposed companies' pension deficits.[88]

This shift was perhaps the start of the leveraged LDI reliance. For those that remain on defined benefit plans, fund managers have turned to leveraged liability-driven investment strategies to boost yield and attempt to bridge the gap between the benefits owed and the funds available.[89] In 2006, the Pension Protection Fund reported that that DB funds were 62% invested in equities and 28% in bonds.[90] By 2021, though, DB funds invested 72% to bonds and 19% to equities and other investments (i.e. property and hedge funds).[91]

II. LDI and Pensions

Liability-driven investment ("LDI") is fundamentally a strategy that matches investment maturation with materialization of pension plan liabilities.[92] DB funds calculate their cost today to meet expected liabilities in the future using a discount rate.[93] LDIs first emerged in the late 1990s, but was soon adopted by the DB pension industry, in the early 2000s, partly in response to changes in U.K. accounting standards for

[87] *Id.* at 112 ("Pension members also have less risk as they are no longer reliant on the performance of equities for their pensions.").
[88] *Id.* at 3 ("Equity investment for pension funds looked to have served pension funds well throughout the 1980s and 1990s as they accumulated increasing surpluses thanks to bull markets.").
[89] Chris Flood, *UK pensions industry faces 'fundamental shift'*, FIN. TIMES, Apr. 14, 2018.
[90] Harriet Agnew, Josephine Cumbo, & Jonathan Eley, *Pension Funds After the Gilts Crisis: The Big Asset Allocation Rethink*, FIN. TIMES, Nov. 8, 2022.
[91] *Id.*
[92] HC 826, *supra* note 19 at 9 ("The aim of LDI is to provide stability in a pension scheme's funding level by investing in assets, whose value moves in the same direction as the scheme's liabilities in response to interest rate changes.").
[93] *Id.* ("[Accounting standards FRS 17 and IAS 19] also required liabilities to be valued as a single figure using a discount rate based on the yield of bonds with at least an AA credit rating. A discount rate is a figure used to calculate the present-day costs of a future stream of payments. The future stream of payments is discounted by a rate reflecting the estimated cost of meeting them.").

pension funds under Financial Reporting Standard 17 ("FRS 17"), issued by the Accounting Standards Board.[94] Among other requirements, FRS 17 mandated that pension assets be measured at market value, that pension liabilities be measured by applying the projected unit credit method, and that a resulting deficit be presented on the plan sponsor's corporate balance sheet.[95] The net impact of pension liabilities on the financial condition of the employer was thus required to be reflected on the employer's balance sheet. As a consequence of the higher level of disclosure, which exposed deficits, DB funds turned to LDI to bridge the liabilities to assets gap.[96] For some funds, "leveraged" LDI was a way for DB funds to hold long-dated gilts while borrowing back part of their value to invest in riskier assets in the expectation (or at least the hope) of producing higher returns.[97] In the Bank of England's November 2018 Financial Stability Report, most DB funds were in deficit, with liabilities that were exposed to interest rate and inflation risk,[98] but by March of 2021, most schemes were in surplus, perhaps due to the success of leveraged LDI.[99]

The LDI strategy itself does not necessarily involve leverage. Many LDI-invested DB funds, though, did use leverage, which is the use of borrowed money (debt) to invest, with the proceeds used either to make investments that hedge against risk or to make investments in

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[94] Dr. Iain Clacher & Peter Moizer, *Accounting for Pensions*, LEEDS UNIV. BUS. SCH. 1, 11 (Sept. 2011), https://www.plsa.co.uk/portals/0/Documents/0190_%20Accounting_for_PensionsL.pdf [https://perma.cc/YDZ7-E64M].
[95] *Id.*
[96] IMF, *Lessons from the United Kingdom's Liability-Driven Investment (LDI) Crisis*, United Kingdom: Selected Issues (July 2023); Hemal Popat & James Lewis, *Are DB Schemes Over-Hedged?*, MERCER (Apr. 2022), https://www.mercer.com/assets/uk/en_gb/shared-assets/local/attachments/pdf-2022-mercer-are-db-schemes-over-hedged-report-uk.pdf.
[97] Letter from Lord Hollick, Chair of the Industry and Regulators Committee, to Andrew Griffith MP, Economic Secretary to the Treasury, & Laura Trott MBE MP, Parliamentary Under Secretary of State (Minister for Pensions) (Feb. 7, 2023) (on file with the Industry and Regulators Committee); HC 826, *supra* note 19 at 11.
[98] *Financial Stability Report*, *Issue No. 44*, BANK OF ENGLAND 1, 55 (Nov. 2018) [hereinafter *Financial Stability Report*].
[99] HC 826, *supra* note 19 at 10 ("However, since March 2021 the majority of schemes have been in surplus each month. In April 2023, 87% of schemes were in surplus.").

growth assets.[100] DB funds borrowed against the gilts that they held principally through gilt repos. Gilt repos are repurchase agreements where the pension scheme sells a gilt to the investor (or a bank for bank-intermediated repo) and buys them back on an agreed date at an agreed price that is usually higher to account for the interest cost.[101] The value of the gilt, pledged as collateral, can change while the repurchase agreement is in effect. To maintain the agreement, collateral payments are exchanged as the gilt's value changes.[102] Value may be passed from the gilt holder-investor to the fund if the value of the collateral increases. When the pledged security's value decreases, the fund is required to post additional collateral. This fundamental component of repurchase agreements was a critical aspect of the September 2022 crisis.

Since LDI intrinsically involves matching long-dated liabilities with long-dated investments, DB funds had "the largest amount [of] outstanding non-bank gilt repo borrowing, concentrated at longer maturities" as of mid-2018.[103] The fact that the collateral consisted largely of long-dated investments was the source of much of the problem. The long-dated investments in debt-securities like gilts, however, are more interest-rate sensitive, and therefore more volatile, than shorter-dated investments.[104] The difference in volatility increases with maturity. The pension fund market withstood the volatility, until yields destabilized in September 2022.

According to the Bank of England, DB funds borrowed against gilts to re-invest in gilts, swaps, and derivatives.[105] By engaging in repo-financed additional investments in gilts, DB funds could amplify their otherwise limited exposure to gilts, and their ability to hedge the risks

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[100] *Id.* at 11 ("The LDI model does not necessarily involve leverage: it is a way of managing assets over time."); Adam Hayes, *What is Financial Leverage, and Why Is It Important?*, INVESTOPEDIA (last updated May 12, 2023), https://www.investopedia.com/terms/l/leverage.asp [https://perma.cc/JKT2-8M5L].
[101] Richmond, *supra* note 24.
[102] *Id.*
[103] *Financial Stability Report*, *supra* note 98.
[104] If a one-year zero-coupon bond is compared to a ten-year zero-coupon bond, having the same present value, a particular sensitivity to interest rate changes is apparent. Using the same changes in interest rates (for example, 5% to 6%), the one-year zero-coupon bond's present value changes by 1% and the ten-year zero-coupon bond's present value changes by approximately 10%. Zvi Bodie, Alex Kane, & Alan J. Marcus, ESSENTIALS OF INVESTMENTS 331 (12th ed. 2019).
[105] *Financial Stability Report*, *supra* note 98 at 55.

associated with changes to their liabilities. When gilt prices rose, the funds were provided with additional resources to make other investments because the value of the fund's net assets increased. However, when gilt prices fell and yields rose, the fund's net assets decreased, causing the plan to be in a more leveraged position, and requiring it to post additional collateral pursuant to the terms of its agreements.[106] Additionally, other sources, like the 100 Group Pensions Committee report that the leveraged positions were taken so that funds could invest in riskier growth assets.[107] Those growth assets might be credit assets, equities, infrastructure assets, and property assets.[108] The precise steps to DB fund LDI remain shrouded in mystery, even after the crisis produced a number of reports and investigations from the likes of the BoE, House of Lords Industry and Regulators Committee, and the International Monetary Fund. David Vallery, chief executive officer of the Lothian Pension Fund, remarked tellingly, "We are not sophisticated enough to fully understand it, [and] quite frankly we don't have the resources to fix it if something goes wrong."[109]

DB funds also made other investments, hedging against inflation and interest rate risks using swap agreements. BoE reported in 2018 that DB funds were "net receivers of the fixed rate…acting as a hedge for the interest rate risk on their liabilities."[110] This behavior is unlike hedge funds which switch their positions to offset the different maturities of the investments.[111] When the gilt prices fell and the floating rates went up, the margins on the fixed side of a fixed-for-floating rate swap went down, the funds were also required to post additional collateral.

LDIs have become widely adopted in U.K.'s defined benefit plans, with a survey in 2018 by Hymans Robertson, an actuarial and

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[106] An example of how this works can be found in written evidence published by the House of Commons. Barnett Waddingham LLP, *Written Evidence from the Barnett Waddingham LLP LDI0036*, HOUSE OF COMMONS WORK AND PENSIONS COMM. (Nov. 2022), https://committees.parliament.uk/writtenevidence/113597/html/.

[107] The 100 Group Pensions Committee, *Written Evidence: Inquiry on Defined Benefit Schemes with Liability-Driven Investments (LDI) LDI0062*, HOUSE OF COMMONS WORK AND PENSIONS COMM. (Jan. 2023), https://committees.parliament.uk/writtenevidence/116051/pdf/.

[108] *Id.*

[109] Harriet Agnew et al., *How bond market mayhem set off a pension 'time bomb,'* FIN. TIMES, Oct. 8, 2022.

[110] *Financial Stability Report*, *supra* note 98.

[111] *Id.*

consulting firm, showing that "more than three-quarters of the £1.5tn total assets held by DB schemes already employed some form of LDI, suggesting that new demand could become exhausted over the next three years."[112] The Pensions Regulator estimated about 60% or 3,000 private defined benefit schemes used LDI by the end of 2021.[113] The trend to adoption of LDI largely spiked due to the changes in U.K. accounting standards in the early 2000s, and surged again during the 2008 crisis, when low interest rates pushed fund managers to take on more risk in an effort to produce higher returns.[114] Gilt repos became a popular investment strategy during that time, as plans' efforts to minimize deficits.[115] Many of its supporters claim that strategy has proven effective, with the bull market for bonds having driven up prices and depressing yields.[116] The funds that did not embark on LDI strategies were struggling to meet the demand for returns.[117] LDI even survived the 2008 financial crisis.[118] When the price of gilts rose suddenly, causing a drop in yield, funds saw their deficits grow, which meant they had to buy more bonds.[119] The funds which were already using LDI in 2006, though, saw their schemes protected against a reduction in real yields, as the strategy "'immuni[zed]' defined-benefit schemes against large movements in interest rates and inflation."[120]

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[112] Flood, *supra* note 89.
[113] HC 826, *supra* note 19 at 16 (UK).
[114] Patrick Jenkins, *Failure to learn lessons of 2008 caused LDI Pension to blow-up*, FIN. TIMES, Oct. 3, 2022 ("Years of low interest rates in the run-up to 2008 had encouraged a debt-fueled "search for yield" that took investors into high-risk assets.").
[115] *Id.* ("LDI, based on borrowing (or 'repo-ing') against the collateral of low-yielding gilts, became an increasingly popular way for schemes to offset the shortfall.").
[116] *Id.* ("Schemes and asset managers say that, in the market environment that has characterised the past two decades, it has proved effective. A global bull market for bonds pushed up prices and drove down yields, meaning that pension funds who were unhedged against these moves would have found themselves trying to generate returns to meet ever-increasing liabilities.")
[117] *Id.*
[118] Dan Mikulskis, *A brief history of LDI*, FIN. TIMES, Oct. 5, 2022 ("LDI performed well in the 2008 financial crisis. Even the schemes that had swaps with Lehman Brothers came out broadly unscathed.").
[119] *Id.*
[120] Agnew et al., *supra* note 109.

In 2016, the U.K. voted to exit the European Union, causing market volatility.[121] Gilt yields tanked as a result of the speculation surrounding the U.K. vote.[122] As the Bank of England tried to stimulate the economy by lowering interest rates, yields collapsed (as prices went up), and fund managers were left scrambling for the resources with which to continue paying benefits to pensioners.[123] BoE also issued a £70 billion asset purchase program at the time, which compounded the LDI funds difficulties by further driving up gilt prices and depressing yields.[124] Since the plummeted yields on 30-year gilts in 2016, yields have consistently decreased until the 2022 episode.[125]

In 2018, Hymans Robertson predicted the so-called "Peak LDI" to occur in 2021, given that hedging was already occurring at a high level.[126] KPMG's report concluded more optimistically that there was "no end to growth in sight" for LDI assets.[127] When it seemed like gilt supply could be the limiting factor, the U.K. government expanded gilt issuance.[128] In 2018, though, the Bank of England did notice the potential for liquidity risk, which is the potential call for collateral in a stress.[129] BoE found it unclear if the funds and insurers are paying sufficient attention and said it would "enhance the monitoring of the potential liquidity demands and losses."[130] With the events of Truss's short-lived administration, the U.K. and the world saw this liquidity risk manifest.

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[121] DELOITTE, TURBULENT TIMES AHEAD FOR PENSION FUNDS? BREXIT AND PENSIONS, 1 (2016) ("The UK's vote to exit the European Union on 23rd June caused unprecedented short term market volatility and will have far reaching implications over the coming months and years.").
[122] *Id.*
[123] Elaine Moore & Josephine Cumbo, *Fears for pensions as gilt yields turn negative*, FIN. TIMES, Aug. 10, 2016 ("The BoE's stimulus plan, which included the first cut in interest rates in seven years as well as the £70bn asset purchase programme, has intensified a worldwide fall in bond yields.").
[124] *Id.*
[125] *United Kingdom 30 Years Bond – Historical Data*, WORLD GOV. BONDS, https://www.worldgovernmentbonds.com/bond-historical-data/united-kingdom/30-years/#title-historical-data [https://perma.cc/4UF5-TDHA] (last updated Mar. 25, 2024).
[126] HYMANS ROBERTSON & NOMURA, *supra* note 77 (referencing leveraged LDI).
[127] Flood, *supra* note 89.
[128] Mikulskis, *supra* note 118.
[129] *Financial Stability Report*, *supra* note 98 at 54.
[130] *Id.*

III. Current Issue

After Liz Truss's announcement, gilt yields soared within minutes and the pound dropped to "its lowest level on record against the U.S. dollar."[131] With LDI strategies, funds had already hedged against interest rate volatility to some degree.[132] Leveraged LDI strategies, though, only held limited liquidity buffers to deal with rising or falling yields.[133] When yields spiked dramatically, the funds' leverage increased, causing a margin call or coverage of losses in the leveraged investment agreement.[134] Because gilts acted as collateral in leveraged LDI strategies like gilt repos, funds were forced to sell some portion of gilts, further depressing prices.[135] Posting additional collateral would take weeks that the asset managers did not have before having to close the trades.[136] If the trades fell through, then the funds would no longer be hedged against real yield falls and be vulnerable to changes to yield.[137]

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[131] Rennison, *supra* note 14.
[132] *Id.* ("To guard against that risk, pension funds have increasingly turned to what's called a liability-driven investment strategy, a way of using derivatives and other products linked to gilts that hedge against a drop in interest rates.").
[133] Sarah Breeden, Deputy Gov. of the Bank of England for Fin. Stability, Speech at International Swaps and Derivatives Association & Alternative Investment Management Association Conference (Nov. 7, 2022).
[134] Loukia Gyftopoulou & Greg Ritchie, *The Pension Fund Strategy That's Plaguing the UK Bond Market*, BLOOMBERG L., Oct. 19, 2022, https://www.bloomberglaw.com/product/blaw/bloombergterminalnews/bloomberg-terminal-news/RJY0WIT1UM0W ("But when yields spiked, they were hit with sudden demands for funds to cover their losses -- what's known as a margin call.").
[135] Breeden, *supra* note 133.
[136] *Id.* ("Then on Tuesday, asset managers still waiting for collateral and running out of time began to close out their trades, putting further pressure on the market because exiting such trades replicates the effect of selling more gilts, amplifying the sell-off.").
[137] Tommy Wilkes & Carolyn Cohn, *How Britain's pension scheme hedge became a trillion pound gamble*, REUTERS (Oct. 17, 2022), https://www.reuters.com/business/finance/how-britains-pension-scheme-hedge-became-trillion-pound-gamble-2022-10-15/ [https://perma.cc/832Q-PKJX] ("When yields surged in an unprecedented move between Sept. 23 and Sept. 28, pension schemes were left scrambling to find cash for collateral. If they did not find it in time, the LDI providers wound down their hedges, leaving schemes exposed when yields tanked following the BoE intervention.").

Before a bailout was announced, funds attempted to cover the margin call by selling assets, including gilts, which depressed prices even more and continued to drive yields up.[138] Ultimately, the funds were bailed out by the Bank of England, to prevent further damage to the pension market and to calm financial markets overall.[139] On September 28th, 2022, five days after Truss's initial announcement, BoE pledged to buy bonds "at a rate of up to [£]5 billion a day for the next 13 weekdays, in an attempt to restore proper market functioning."[140] Yields began to fall shortly thereafter, returning the market back to more like its normal state.[141] Though the LDI market might have calmed, other aspects of U.K. financial market were harmed.[142] After its sharpest-ever spike, BoE's action induced the "largest fall on record for UK long-term yields."[143] The sudden movement in rates affected borrowing costs, including mortgage loans.[144]

Furthermore, the calm only lasted for only as long as the BoE agreed to buy bonds.[145] When BoE announced that it would end its plan by October 14th, 2022, prices dropped and yields again rose.[146] BoE could not continue the bond-buying program, though, as it conflicted with the Bank's longer-run goal of lowering inflation and stabilizing the economy.[147] Among its internal conflicts, BoE also struggled against the

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[138] Agnew et al., *supra* note 109 ("The shock fall in gilt prices led to a rush of cash calls. To raise the money, funds were forced to sell assets, including gilts, depressing prices further and risking a "doom loop".).

[139] *Quarterly Bulletin: Financial stability buy/sell tools: a gilt market case study*, BANK OF ENGLAND (Nov. 20, 2023), https://www.bankofengland.co.uk/quarterly-bulletin/2023/2023/financial-stability-buy-sell-tools-a-gilt-market-case-study [https://perma.cc/6LPH-3A5S].

[140] Rennison, *supra* note 14.

[141] *Id.*

[142] Gyftopoulou & Ritchie, *supra* note 134 ("These benchmark rates impact borrowing costs in the wider economy and were causing turmoil for some consumers and businesses, with mortgage products getting withdrawn and deals collapsing.").

[143] *Id.*

[144] *Id.*

[145] Joe Rennison, New Doubts Are Rattling U.K. Markets, N.Y. TIMES, Oct. 12, 2022, at B1.

[146] *Id.* ("But as soon as the central bank reiterated its plan to pull back from the market on Friday, 30-year gilt yields again rose above 5 percent, setting up a volatile end to the week.").

[147] *Id.* ("Part of the challenge for the central bank is that its short-term bond-buying program—which it installed to bring calm to the markets after the

political backdrop. Since the announcement of the tax plan and deregulation policies, Truss had vowed not to back down on the fiscal policies,[148] Kwarteng announced the reversal of the tax cut program,[149] then Truss fired Kwarteng, and after that announced she would not block a corporate tax increase (another reversal of her plan).[150] Firing Kwarteng did not restore value to the pound, nor did it restore bond prices to there level before her announcement.[151] Then, Truss herself stepped down on October 20th, 2022, after six weeks in office.[152] In the aftermath of the chaos, regulators throughout the U.K., Ireland, and Luxembourg demanded closer scrutinization of the use by pension funds of leverage.[153] While it seems like most of the crisis has subsided, LDI managers are continuing to take note of the dangers of LDI strategies involving leveraged yield-enhancing investments, and shifting to a more liquidity-friendly strategy.[154]

At the end of the day, the crux of the problem for pension funds was their usage and reliance on debt- (or repo-) financed yield-enhancing investments involving liquidity and other risk, not the use of LDI itself. The solution should therefore not be to simply forgo all LDI. LDI does appear to contribute to the management of pension fund assets and liabilities by protecting against the interest rate changes and inflation.[155] If pensions are going to continue using LDI, though, what

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Truss government's plans spooked investors—runs counter to its longer-term efforts to unwind pandemic-era bond purchases and raise interest rates. The goals are similar to those of other central banks as they seek to cool the economy and lower inflation.").

[148] Jenni Reid, *UK PM Liz Truss defends tax cuts, vows to press on*, CNBC, Sept. 29, 2022, https://www.cnbc.com/2022/09/29/uk-pm-liz-truss-defends-tax-cuts-vows-to-press-on.html [https://perma.cc/S2CB-JVUD].

[149] Mark Landler & Stephen Castle, *Truss, in Reversal, Drops Plan to Cut U.K. Tax Rate on High Earners*, N.Y. TIMES, Oct. 4, 2022, at A9.

[150] Stephen Castle et al., *U.K. Government Reverses Course on Fiscal Plan That Rattled Markets*, N.Y. TIMES, Oct. 14, 2022, https://www.nytimes.com/live/2022/10/14/world/uk-finance-minister-truss-kwarteng?smid=url-share.

[151] *Id.*

[152] Mark Landler & Stephen Castle, *Truss Steps Down, Capping Six Weeks of Turmoil in U.K.*, N.Y. TIMES, Oct. 21, 2022 at A1.

[153] Josephine Cumbo, Laura Noonan, & Chris Flood, *Offshore Fund Centres Tighten Oversight After UK's LDI Crisis*, FIN. TIMES, Oct. 28, 2022.

[154] Agnew, Cumbo, & Eley, *supra* note 90.

[155] Agnew et al., *supra* note 109 ("One option is to jettison the LDI strategies altogether but that leaves pension schemes exposed to future swings in rates and inflation.").

changes need to be made? The signs of a potential collapse were present in 2022. In addition to the arguments that an LDI bubble was growing, as discussed in Part II, it should also be noted that the version of LDI that led to the crisis had evolved from what had been created in the early 2000s. The original LDI was developed to hedge against risk; the version that was vulnerable to collateral margin calls may also have involved speculation in high risk investments beyond what was needed to match liabilities.[156] John Ralfe, the pioneer behind the Boots Company move to bonds from equities in 2001, likens today's LDI to "badly run hedge funds," motivated by the greed of investment consultants.[157] Though triggered by different events, the chase for yield in 2022 mirrored that of 2008.[158] It is critical to determine if this is happening to finance pension benefits or enhance private returns.

The major difference between Ralfe's LDI and the "problematic" LDI is leverage, using debt-financed investments in risky investments made to increase potential returns.[159] The use of leverage is not intrinsically bad, but needs to be done transparently, so that the resulting risks, not merely of the investments, but also of the volatility of the collateral securing the leverage, can be accounted for.[160] Like the

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[156] John Ralfe, *Investigation Needed to Hold Those Behind UK Pension Crisis to Account*, FIN. TIMES, Oct. 14, 2022 ("LDI has evolved from that into something quite different from just hedging liabilities to pay pensions. What we see now is happening because pension schemes have been speculating—investing in equities, private equity and hedge funds, with disguised borrowings or leverage—not hedging.").

[157] *Id.* ("By increasing leverage, many UK pension schemes have been operating as badly run hedge funds, increasing risk for themselves and the whole financial system. This greed, stupidity and laziness was encouraged by investment consultants, who get paid for complexity.").

[158] *See* Jenkins, *supra* note 114.

[159] Hayes, *supra* note 100.

[160] Chris Hughes, *How Could So Much Pension Leverage in the UK Lurk Unseen?*, WASH. POST, Oct. 6, 2022, https://www.washingtonpost.com/business/how-could-so-much-pension-leverage-in-the-uk-lurk-unseen/2022/10/06/9126b700-4534-11ed-be17-89cbe6b8c0a5_story.html [https://perma.cc/9JC3-QSWM] ("It's likely that this problem mainly afflicted smaller funds with deficits (pension assets worth less than the corresponding liabilities). But it's hard to know where this is really taking place because it just isn't clear."); Alex Beath, *Leverage, Risk, and Investment Performance at Large Pension Funds*, PENSION FUNDS ONLINE, https://www.pensionfundsonline.co.uk/articles/leverage-risk-and-investment-performance-at-large-pension-funds ("So is leverage bad. No.

regulations in the early 2000s that exposed pension deficits, U.K. lawmakers should consider similar regulations to improve transparency and force managers to be cautious about their LDI transactions.[161] Currently, there is "no detailed information about these derivative trades released publicly."[162] Perhaps other safeguards like leverage caps and higher capital buffers are necessary to reduce the risks of another such disaster in the future, given that existing liquidity buffers were not enough to insulate funds from market shocks.[163] DB funds and banks that reciprocate their repo swaps should also be more alert to the liquidity risk of which the BoE warned in 2018.[164]

As long as the leverage is managed more prudently, with a more careful eye on the liquidity risk, another episode of this scale is more likely to be avoided. The U.S. and the Netherlands have avoided comparable chaos with their defined benefit pensions. According to Sirio Aramonte and Phurichai Rungcharoenkitkul's Bank of International Settlements' quarterly review issued in December 2022, "US pension funds seldom use leverage, while Dutch funds hedge less than 60 per cent of their interest rate risks on average."[165]

Finally, as companies continue to close out defined benefit schemes, the scale of these funds will also shrink as benefits to the remaining members are liquidated over time.[166] This recent crisis may also push more plans to close out their defined benefit schemes and transition the rest of their employees to defined contribution plans.

Perhaps we shouldn't be celebrating it, but funds should be using it appropriately to do the job of keeping pensions whole.").

[161] Chris Flood & Josephine Cumbo, *UK Regulators Call for Action on Hidden Leverage Threat to Pension Funds*, FIN. TIMES, Nov. 20, 2022 ("Last week, the heads of the Financial Conduct Authority and The Pensions Regulator conceded to a House of Lords committee that they had not been paying sufficient attention to the use of LDI by pension funds.").

[162] *Id.*

[163] *Id.* ("Stronger safeguards—including leverage caps and higher capital buffers on LDI strategies—are now being considered, the FCA said."); HC 826, *supra* note 19 at 21 ("The collateral buffers in place had proved insufficient to the rise in gilt yields…LDI funds and pension schemes lacked resilience to shocks, having not adequately adjusted resilience levels in response to changes in gilt yields through the year.").

[164] *Financial Stability Report*, *supra* note 98.

[165] Flood & Cumbo, *supra* note 161.

[166] *Id.* ("With defined benefit schemes shrinking as part of overall work-based pensions relative to defined contribution schemes, the LDI problem will wane over time.")

However, in 2022, the funds were still a massive part of the financial market that affected other sectors, and public pensions will likely persist in the form of DB plans. A public finance issue of this scale warranted central bank interference, so preventative reforms must be considered.

IV. Lessons Learned and Potential Solutions

Should the pension market retreat to its "sleepy corner" and abandon the use of leverage in financing returns to LDI invested plans?[167] The leveraged investments by LDI-invested pensions do not seem nearly as risky, and did not produce damage anywhere nearly as widespread, as the subprime mortgage deals of 2007. Leverage does, however, add a layer of risk in exchange for a potential increase in returns.[168] The House of Lords Industry and Regulators Committee ("Committee") have effectively denounced leveraged LDI.[169] In a letter to the Economic Secretary to the Treasury and Minister for Pensions, Lord Hollick, Chair of the Industry and Regulators Committee, wrote that the committee has found that leveraged LDI was created as a "solution to an artificial problem created by accounting standards,"[170] that current European Union ("E.U.") legislation does not allow that use of borrowing and derivatives; but that U.K. regulations have adopted the E.U. legislation, leaving out language that prohibits the use of leveraged LDI for pensions.[171]

Since the Committee's recommendations, the House of Commons have also issued a report, but no significant action has been taken.[172] The Financial Policy Committee ("FPC") has recommended that The

[167] Rennison, *supra* note 14 (dubbing the pension industry as the "sleepy corner").
[168] Robin Wigglesworth, *Lessons from the UK Pension Fund Shock*, FIN. TIMES, Sept. 29, 2022 ("This is no flashy hedge fund strategy, or daring bond king bet gone horribly awry. It is the financial market equivalent of doing your family taxes. But it hammers home a truism from many previous market calamities, including the global financial crisis of 2008: the greatest damage is often caused by supposedly stolid investments that turned out to be anything but, rather than nakedly risky bets.").
[169] Letter from Lord Hollick, *supra* note 97.
[170] *Id.* at 2.
[171] *Id.* at 11 ("However, the UK regulations transposing the relevant EU legislation do not include this reference to investment, with some suggesting that this may have been done in order to allow the continued use of leveraged LDI.").
[172] HC 826, *supra* note 19.

Pension Regulator ("TPR") continue to work with domestic and international regulators to ensure that LDIs maintain "resilience" against future volatility.[173] Resilience standards protect LDIs from having to disrupt the market again with forced asset sales and margin calls.[174] The Bank of England has issued a report assessing what is appropriate resilience.[175] According to the report, LDI strategists should hold enough liquid assets to be able to withstand a minimum shock of around 250 basis points.[176] While BoE portrays the resilience standards as temporary, it could be a strong starting point for regulation. If these resilience standards are monitored and adjusted to the market at least annually, it could prevent another pension crisis.

V. Implications on the U.S. and Risk of a Similar Crisis

Could a similar problem happen to U.S. pension funds? Interest rates have been volatile and rapid changes in rates could (in theory at least) lead to a similar chain reaction in the U.S.[177] Domestic rate changes could trigger a U.K.-reminiscent disaster, but if so it could be on a global scale.[178] Japan, among other nations, heavily purchases U.S. debt, and if it were to suddenly cease its purchases the U.S. debt market

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[173] *Bank Staff Paper*, *supra* note 25.
[174] *Id.* ("The systemic resilience component would aim to ensure that all LDI funds are able to absorb a severe but plausible historical stress over the period of time needed to recapitalise the fund without the need for forced asset sales. Such forced selling disrupts gilt market functioning, tightening credit conditions for UK households and businesses and increasing risk to the financial system.").
[175] *Id.*
[176] *Id.* ("The FPC judged that these factors meant that the size of the yield shock to which LDI funds should be resilient should be, at a minimum, around 250 basis points.").
[177] Jeanna Smialek, Jim Tankersley, & Joe Rennison, *Could a Bust Like Britain's Hit the U.S.?*, N.Y. TIMES, Oct. 20, 2022, at B1 ("Markets have been choppy for months in the United States and globally as central banks—including the Fed—rapidly raise interest rates to bring inflation under control.").
[178] *Id.*

could destabilize.[179] A direct, domestic impact on the U.S. pension system would be unlikely to occur, though, due to the differences between the U.S. and U.K. pensions.

If something similar were to occur, the Federal Reserve Bank ("Fed") would have to act similarly to the Bank of England – i.e., opposite of their goals of controlling inflation.[180] To stabilize the market the Fed would have to buy Treasury bonds as they have in the past, principally in the form of the "quantitative easing" episodes in the wake of the 2008 crisis.[181] Compared to England, though, the U.S. is currently in relatively strong economic health, with "still-rapid job growth and relatively low household debt."[182] U.K. was going through a period of stagnation before the budget announcement. However, as response to the U.K. crisis, Treasury Secretary Janet Yellen foresees a lack of adequate liquidity in the U.S. market, which was the core of the U.K. issue, as discussed in the previous section.[183]

While U.S. defined benefit plans do use LDI, they are "less exposed to the kind of margin call doom loop that enveloped the UK plans in" 2022.[184] JPMorgan analysts distinguished the U.S. pensions from those in the U.K. in that the U.K. schemes lacked enough "high-duration, high-grade, long-maturity fixed income," meaning the U.S. pension funds do not carry an "elevated risk of forced selling of assets".[185] Compared to the unclear derivative positions of the U.K. pensions, independent investment advisor NISA estimates that "less than 10% of interest rate hedges in US funds come from derivatives and they are instead usually structured as separately managed accounts

[179] *Id.* ("If that turmoil caused Japan to reverse course and stop buying or even sell U.S. Treasury—something that it has signaled little appetite for, but that some on Wall Street see as a risk—it could have ramifications for U.S. debt markets.").
[180] *Id.* ("A financial disaster could force the Fed to deviate from its plan to control the fastest inflation in four decades, which includes raising rates rapidly and allowing its bond portfolio to shrink.").
[181] *Id.* ("Officials have in the past bought large sums of Treasury bonds in order to restore stability to flailing markets—essentially the opposite of their policy today.").
[182] *Id.*
[183] *Id.* ("'We are worried about a loss of adequate liquidity in the market,' Ms. Yellen said last week while answering questions after a speech in Washington.").
[184] Robin Wigglesworth, *Could the LDIbacle happen in the US?*, FIN. TIMES, Oct. 24, 2022.
[185] *Id.*

(SMAs) whose multiple levels of collateral backstops and centralized structure means they have more flexible margin requirements and less systemic risks."[186] Head of LDI Solutions at Capital Group, Gary Veerman, does not think the U.S. market is susceptible to the same issues as the U.K., because the core of U.S. pensions that hedge is usually corporate bonds and derivatives are used to supplement the hedge.[187]

How transparent are the leverage positions of the U.S. pensions? Some who believe the U.S. is at risk argue that leverage is not properly disclosed to the public and that the massive underfunding of pensions could lead to further risk.[188] Further, the political issues that undermined BoE's attempt to stabilize the economy are amplified in the U.S. While the U.K.'s recent drama from Boris Johnson's resignation and Liz Truss's short-lived administration to Rishi Sunak's hurried takeover certainly spurred unrest, the U.S. has been politically polarized since Donald Trump's administration in 2016. With the polarization only growing since then, conservative Republicans like Ron DeSantis (Governor of Florida) and Greg Abbott (Governor of Texas) found a platform for demanding higher returns on state and local government pensions.[189]

Overall, though, it is unlikely that U.S. pensions will suffer on the same scale that U.K. pensions have. U.S. pensions do not use as much leverage if they use LDI and with the warnings coming from the U.K. as well as calls to regulators to act, pensions should have enough

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[186] *Id.*

[187] Alicia McElhaney, *Why U.S. Pensions Shouldn't Be Too Worried About the U.K.'s LDI Crisis*, INST. INVESTOR (Oct. 17, 2022), https://www.institutionalinvestor.com/article/b2087s3k0wf57c/Why-U-S-Pensions-Shouldn-t-Be-Too-Worried-About-the-U-K-s-LDI-Crisis [https://perma.cc/8BRB-FRS5] ("[Gary Veerman] noted that the 'core part' of hedging programs in U.S. LDI strategies is typically corporate bonds…When these plans do use derivatives, they use them to 'tighten the screws on the hedge,' he added. 'The derivatives in the United Kingdom are the screw.'").

[188] Edward Siedle, *UK Pension Fund Near-Collapse Is A Warning For America's Pensions*, FORBES, Oct. 6, 2022, https://www.forbes.com/sites/edwardsiedle/2022/10/06/uk-pension-fund-near-collapse-is-a-warning-for-americas-pensions/?sh=7680d69174fe.

[189] *Id.* ("Politicians who lack any investment experience, such as Florida Governor Ron DeSantis and Texas Governor Greg Abbott, are increasingly calling for state and local government pensions around the country to fully embrace their political agendas and abandon prudent investment practices.").

time to alleviate liquidity risk. Only time will tell if a similar crisis occurs, but if one does occur, it will likely reverberate across the world on a larger scale than the U.K. crisis did, given how many foreign markets invest in U.S. debt.

VI. Conclusion

The U.K. pension crisis seemed to go away as quickly as it arrived. However, U.K. pension schemes were clearly vulnerable after years of unregulated evolution into a highly leveraged, highly complicated "strategy" that was not transparent to the investors or the public. Liz Truss is no longer in office and her budget never passed, but the mere proposal threw a hefty industry into turmoil, revealing its weaknesses. Market analysts and pension advisors warned against the continuous growth of LDI strategies. Ultimately, the funds' reliance on leveraged-based transactions led to a crunch for collateral that was simply unavailable. The U.K. pension market has largely recovered from the turmoil, with a few funds losing some valuable assets as they scrambled to cover their margin call. Regulators will likely pass a transparency law, requiring fund managers to reveal how exactly they are investing and, in particular, how they are using leverage.

The lessons learned from the crisis come down to more transparency via regulation. While this massive industry of defined benefit schemes might cease to exist in fifty years, there are still pensioners that rely on the asset management of the funds in order to receive the benefits to which they are entitled. The crisis also signaled to the world that the danger may lurk behind LDI and is a cautionary tale to managers that seek returns above what is needed to match their liabilities.