



Moral Hazard and the deposit insurance cap: a case study of Northern Rock and Silicon Valley Bank

Jay Cullen

To cite this article: Jay Cullen (29 Oct 2024): Moral Hazard and the deposit insurance cap: a case study of Northern Rock and Silicon Valley Bank, Law and Financial Markets Review, DOI: [10.1080/17521440.2024.2403395](https://doi.org/10.1080/17521440.2024.2403395)

To link to this article: <https://doi.org/10.1080/17521440.2024.2403395>



© 2024 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group



Published online: 29 Oct 2024.



Submit your article to this journal [↗](#)



Article views: 42



View related articles [↗](#)



View Crossmark data [↗](#)

Moral Hazard and the deposit insurance cap: a case study of Northern Rock and Silicon Valley Bank

Jay Cullen 

Financial Regulation, Edge Hill University, Ormskirk, UK

ABSTRACT

The main contention of this article is that government insurance for bank deposits should be unlimited. In spite of claims made in the literature concerning the moral hazard dangers of deposit insurance schemes, I argue that these claims are unconvincing; indeed, the empirical record - discussed here in relation to Northern Rock and SVB - demonstrates that uninsured depositors exhibit similar behaviour to their insured counterparts, undermining the claim that limiting insurance induces risk-monitoring. In contrast, there is strong evidence that in developed jurisdictions with established, mature regulatory institutions, deposit insurance does not result in excessive risk-taking on the part of banks. The significant financial stability benefits accruing to insuring bank deposits include the elimination of depositor runs, a reduction in the incentives for unregulated bank-like financial intermediation (shadow banking), and heightened competition. Activity restrictions and other measures can reduce any heightened risk-taking which emerges as a result of wider insurance coverage.



ARTICLE HISTORY

Received 31 May 2024
Accepted 2 August 2024

A. Introduction

The market turmoil stemming from the failures of Silicon Valley Bank¹ (SVB), as well as other US and European financial institutions in 2023, remind us that '[t]he hard lesson of banking history is that the liability side of banking is not the place for market discipline.'² These failures recall similar episodes which characterised the collapse of several retail banking institutions during the fallout from the global financial crisis (GFC) of 2007-09.

The main contention of this article is that government insurance for bank deposits should be unlimited. The topic of bank deposit insurance, particularly in the economics discipline, is frequently associated with some of the more controversial topics of study: moral hazard, free-riding, private liability backstopping and ever-increasing extensions of government safety nets to the financial system. Copious studies purport to 'prove' that the incentives

CONTACT Jay Cullen  cullenja@edgehill.ac.uk  Professor of Financial Regulation, Edge Hill University, Ormskirk, UK
This article has been corrected with minor changes. These changes do not impact the academic content of the article.
¹Such failures also included the collapse of ... In the interests of brevity, in the remainder of this article, the collective failures of these institutions will be referred to as the '2023 failures'.

²W Mosler, 'Proposals for the Banking System' (*Huffington Post*, 25 May 2011), https://www.huffingtonpost.com/warren-mosler/proposals-for-the-banking_b_432105.html?guccounter=1

© 2024 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group
This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives License (<http://creativecommons.org/licenses/by-nc-nd/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited, and is not altered, transformed, or built upon in any way. The terms on which this article has been published allow the posting of the Accepted Manuscript in a repository by the author(s) or with their consent.

created by insuring bank deposits leads to financial fragility, because the guarantees provided by such arrangements lead risk-taking bankers to gamble with cheap sources of funding, whilst simultaneously allowing creditors to shirk their monitoring function.

In this article I argue that these debates are much more convincing in theory than practice. As I will show, the evidence that monitoring by depositors increases with lower deposit guarantees is not conclusive; indeed, the empirical record demonstrates that the opposite effect is frequently evidenced. There is also strong evidence that in developed jurisdictions with established, mature regulatory institutions that deposit insurance does not result in excessive risk-taking on the part of banks.

The putative main financial stability benefit to insuring bank deposits is the almost total elimination of the potential for depositor runs, thereby ‘panic-proofing’ the banking system. In the modern era the potential for instability from runs is amplified by the rapidity and scale with which depositor withdrawals can occur. This is both a tech and social media phenomenon, whereby information is exchanged at high speed and deposit withdrawals can be made almost instantaneously.³ The SVB collapse provided a textbook example of such dynamics. Panic-proofing the banking system in this way by virtually eliminating the incentives to run would therefore be stability-enhancing.

Yet, this is far from the sole benefit from such a reform. Limiting deposit insurance harms competition in the banking system, as deposits flow to the largest banks which are regarded as safer because of their size and also have lower funding costs because it is perceived that they are more likely to be rescued than their smaller counterparts. Whilst guaranteeing bank liabilities provides cheaper funding from the market, competition in the banking system is already distorted significantly by implicit subsidies to the largest banks since the full amount of their deposits and debts of such institutions are effectively guaranteed by the state, because the potential costs of large bank failures are often so substantial. Those failures may prove so costly precisely because banks are the primary issuers of money-like liabilities that nevertheless are largely uninsured.⁴

Further, there are also significant externalities generated by placing legal limits on bank deposit coverage, in particular the emergence of bank-like financial intermediation services outside both the regulatory and safety nets. Such ‘shadow banks’ have emerged in part because of the incapacity of the banking system to mitigate some of the risks faced by large institutional investors with large cash reserves which they cannot deploy to the banking system because of deposit insurance caps. The shadow banking system proved the locus of the financial distress which gave rise to the GFC. Extending deposit guarantees would therefore immediately diminish the utility of the shadow banking system and almost certainly lead to lower speculative trading volumes on secondary markets. On the flip-side, rules relating to the banking sector would be simplified, as many of the requirements under liquidity regulations could be relaxed.

There may be tradeoffs in the introduction of such guarantees. However, I provide evidence that the main so-called drawback of insurance – namely the supposed reduction in monitoring that occurs in the presence of insurance schemes – frequently does not operate in practice; in many circumstances, large uninsured creditors of banks, who

³S Krogstrup, T Sangill and M von Sicard, ‘Containing Technology-Driven Bank Runs, IMF’ (March 2024) <https://www.imf.org/en/Publications/fandd/issues/2024/03/Containing-Technology-driven-bank-runs-Krogstrup-Sangill-Sicard>.

⁴See J McAndrews and others, ‘What Makes Large Bank Failures So Messy and What Should Be Done about It?’ (December 2014) FRBNY Economic Policy Review 229.

have all the ‘correct’ incentives to monitor bank activities and provide market discipline often fail to do so. I provide convincing empirical evidence that in recent runs on depository institutions – Northern Rock in the UK and SVB in the US – those with most to lose (ie. large depositors with deposit amounts in excess of insurance limits, and uninsured creditors) did not exert discipline upon their debtholders in excess of the wider market, indicating that they failed in their monitoring role. Although approximately fifteen years separated their respective failures, as will be explained, the Northern Rock and SVB shared similar characteristics, and their failures followed similar patterns, particularly in relation to the liquidity difficulties which precipitated their rescues.

I conclude by arguing that whilst some costs would arise – a potential increase in moral hazard being one of them – such costs may be mitigated, and in any case likely not as significant as those posed by current institutional arrangements. This stance is bolstered by recent reforms to the banking system designed to underpin its stability; notably the ring-fencing of large universal banks in the UK and efforts to insulate US commercial banking groups from potential spillovers from other trading activities. Both of these measures are designed to minimise the contingent costs to public finances from bank distress. Whilst a ‘zero-failure’ regime is undesirable for a multitude of reasons, the fact that uninsured depositors are rarely subject to any loss during bank failures, means that their claims are already *de facto* insured.

The article proceeds as follows. The next section reviews the functions and evolution of bank deposit insurance schemes. The third section reviews the literature on moral hazard arising from such insurance schemes; this literature universally posits that limiting such schemes is desirable. The fourth section uses cases studies of two banks in the UK and US to demonstrate the limitations of this view. The fifth section discusses the implications of these findings. The final section concludes.

B. Bank deposits and insurance schemes: functions and historical perspectives

1. The function of deposit insurance

Bank deposits are one of the largest constituents of what is usually termed ‘the money supply’ in modern advanced economies.⁵ The money supply consists of what is referred to in general terms as ‘narrow’ and ‘broad’ money. Some bank deposits – namely demand deposits – are included in the narrow money supply measure, although the bulk form part of the broad money supply. In the United States, at the time of writing, commercial bank deposits constituted approximately \$12.5 trillion of which approximately \$1.5 trillion were demand deposits⁶, and \$9.3 trillion were savings deposits.⁷

⁵Methodologies for measuring the money supply and categorisation of financial instruments for those purposes differ across jurisdictions. For discussion, see J Tobin, Commercial Banks as Creators of ‘Money’, No. 159, Cowles Foundations Discussion Papers from Cowles Foundation for Research in Economics (Yale University 1963) in WL Smith and RL Teign, (eds), *Readings in Money, National Income, and Stabilization Policy* (3rd edn, Richard D. Irwin Inc. 1974) 224-229.

⁶Board of Governors of the Federal Reserve System (US), Demand Deposits: Total [DEMDEPSL], retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/DEMDEPSL>, 16 January 2019. The demand deposits component of M1 is defined as total demand deposits at commercial banks and foreign related institutions other than those due to the U.S. government, U.S. and foreign depository institutions, and foreign official institutions.

⁷Board of Governors of the Federal Reserve System (US), Savings Deposits - Total [SAVINGNS], retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/SAVINGNS>, 16 January 2019 Savings deposit component of M2 consists of passbook-type savings deposits as well as MMDAs at banks and thrifts.

The value of deposit insurance was first demonstrated theoretically in the literature by Diamond and Dybvig.⁸ Because banks are funded by short-term demandable liabilities which finance longer-term projects, they are at risk of liquidity problems as a result of this maturity mismatch. This is compounded by the fact that the value of the long-term assets is not easily observable to creditors. The outcomes for depositors in this scenario are contingent on the actions of their fellow depositors. If I anticipate that all other depositors will rush to withdraw their funds from the bank, and I refrain from doing so, my anticipated returns will be lower than if I were to join the rush. Consequently, the Diamond – Dybvig contract gives rise to an equilibrium in which everyone makes a run on the bank because they all expect others to do the same. Only some form of guarantee on bank liabilities might forestall such a run.

Any deposit guarantee coverage must be universal: the credibility of the insurance scheme is contingent on an unwavering guarantee on all bank deposits; otherwise a system-wide run may ensue. These insurance schemes therefore recognise that liquidity problems in a small number of financial institutions must be contained. Because banks act as counterparties to one another (and to other financial institutions), the failure of one institution might quickly bleed into the wider financial system, leading to a run on the banking system itself, as all institutions become subject to depositor withdrawals precipitating a cascade of runs. This may additionally result in the fire-sale of assets to meet depositor demands, reducing their value and leading to a financial crisis. By ensuring that depositors do not have an incentive to withdraw their funding (at least to a certain pre-determined level) bank deposit insurance schemes reduce the risks of contagion.

A significant consequence of the 2023 failures is renewed attention paid to the liquidity management amongst financial institutions, particularly the protection of depositors in banks threatened by insolvency, reflecting their centrality to the smooth operation of the modern payments system, their role in maintaining central banks' interest rate targets, and in credit creation. Such implicit state guarantees which subsist in modern economies with large banking systems complement the direct insurance programmes afforded to banks. Deposit insurance is one of these; others include discount window lending⁹ and access to lender of last resort¹⁰ privileges. These facilities are vital components of the modern financial system, with commercial banking as its lynchpin. In this system, the liabilities of regulated banks are underwritten by the state in exchange for heightened regulatory oversight and the imposition of prudential standards.¹¹

II. Deposit insurance evolution

The first system of deposit insurance was established in the United States in 1933 in response to the Great Depression, via the creation of the Federal Deposit Insurance

⁸DW Diamond and PH Dybvig, 'Bank Runs, Deposit Insurance, and Liquidity' (1983) 91 *Journal of Political Economy* 401.

⁹The discount window, typically overseen by central banks, serves as a tool of monetary policy enabling qualified institutions to obtain short-term loans from the central bank. These loans are utilised to address temporary liquidity shortages resulting from internal or external disruptions. See <https://www.federalreserve.gov/regreform/discount-window.htm>.

¹⁰Lender Of Last Resort (LOLR) functions are fulfilled by central banks and allow central banks to lend to solvent banks at risk of failure against adequate collateral, and which cannot obtain credit elsewhere.

¹¹RC Hockett and ST Omarova, 'The Finance Franchise' (2017) 102 *Cornell Law Review* 1143. See also M Ricks, 'Money as Infrastructure' (2018) 3 *Columbia Business Law Review* 757.

Corporation (FDIC).¹² All Federal Reserve member banks were required to become stockholders of the FDIC by 1 July 1934. No state bank was eligible for membership in the Federal Reserve System until it became a stockholder of the FDIC, and thereby became an insured institution, with required membership by national banks and voluntary membership by state banks. The system is funded by charging banks a premium based upon their size and the riskiness of their asset portfolios, the proceeds of which are added to a pre-positioned fund. It was not until the 1960s that other countries started implementing deposit insurance schemes. By 1980 approximately 20 countries had adopted deposit insurance schemes, but several banking crises during the 1980s led the World Bank and IMF to recommend the establishment of explicit deposit protection to preserve market stability.¹³ As a consequence, varieties of deposit insurance schemes now subsist across jurisdictions globally; as of 2023, 147 countries had some form of insurance system underpinning their banking systems.¹⁴

In the UK, the Financial Services Compensation Scheme (FSCS) covers retail deposits (and some other forms of deposit) up to a prescribed limit. As with the US system, the scheme is putatively funded ex-ante by levies on banks whose depositors are insured under the guarantee. In the European Union, the deposit insurance system is fragmented, with no single EU-wide deposit guarantee system. Instead, an obligation for member states to establish a deposit insurance scheme with minimum national coverage thresholds is in place; such limits must also cover deposits held across EU borders.¹⁵ The national deposit guarantees operate alongside the EU's bail-in mechanism which, mirroring the powers of the Orderly Liquidation Authority in the US¹⁶, allows for residual losses to be absorbed by creditors and non-guaranteed and non-preferred depositors of failing banks.¹⁷

C. The (alleged) fundamental drawbacks of deposit insurance

The literature on the purported risks associated with deposit insurance focus on several classes of problems which in theory may undermine such schemes and result in substantial tradeoffs. Some of these problems are generally associated with any form of insurance scheme and derive from the observation that a party insured against total or partial loss has diminished incentives to refrain from excessive risk-taking. In such circumstances, economic agents do not have to bear the marginal costs of their actions.¹⁸ This issue – referred to as moral hazard – dominates the general perception of all insurance schemes.¹⁹

¹²The FDIC was established under the Banking Act 1933 (often referred to as Glass-Steagall).

¹³A Demirgüç-Kunt, E Kane and L Laeven, 'Determinants of deposit-insurance adoption and design' (2008) 17 *Journal of Financial Intermediation* 407.

¹⁴See <https://www.iadi.org/en/about-iadi/deposit-insurance-systems/dis-worldwide/>.

¹⁵Directive 2014/49/EU of the European Parliament and of the Council of 16 April 2014 on deposit guarantee schemes, OJ L 173, 12.6.2014, 149–178.

¹⁶Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111/203 (July 21, 2010) Pub. L. No. 124 Stat. 1376 Title II.

¹⁷Directive (EU) 2019/879 of the European Parliament and of the Council of 20 May 2019 amending Directive 2014/59/EU as regards the loss-absorbing and recapitalisation capacity of credit institutions and investment firms and Directive 98/26/EC, OJ L 150, 7.6.2019, 296–344. For a critical discussion of the original Directive, see E Avgouleas and C Goodhart, 'Critical Reflections on Bank Bail-ins' (2015) 1 *Journal of Financial Regulation* 3.

¹⁸For instance, see P Johansson and M Palme, 'Moral hazard and sickness insurance' (2005) 89 *Journal of Public Economics* 1879 (finding moral hazard in health insurance markets); JD Cummins and S Tennyson, 'Moral Hazard in Insurance Claiming: Evidence from Automobile Insurance' (1996) 12 *Journal of Risk & Uncertainty* 29; (finding moral hazard in car insurance markets); N Bhutta and BJ Keys, 'Moral Hazard during the Housing Boom: Evidence from Private Mortgage Insurance' (2022) 35 *The Review of Financial Studies* 771 (finding moral hazard in the US mortgage market in the early 2000s).

¹⁹HE Jackson and others, *Analytical Methods for Lawyers* (Foundation Press 2003) 50.

In the remainder of this article I analyse the claim that deposit insurance reduces the monitoring incentives of creditors in the context of banking, thereby making moral hazard more likely to emerge.²⁰

1. Deposit insurance and moral hazard

The supposed conflicts associated with deposit insurance in the context of creditor behaviour may be summarised as follows:

The incentive distortions are [that] ... since depositors are protected when a bank fails, their incentive to monitor the financial condition of their bank is significantly reduced.²¹

Accordingly, in a banking system without deposit insurance, when a bank makes a risky loan, it must offer depositors higher interest rates to compensate for the added risk they are assuming. In contrast, in a system with deposit insurance, depositors are aware that their losses are covered up to the coverage limit, which removes the demand for higher rates on riskier bank lending. Additionally, in the presence of insurance depositors become less cautious in their initial selection of a bank and monitoring its financial health and less likely to withdraw funds early when financial problems arise. This results in a blurring of the relationship between risk and the cost of funding for insured banks. Thanks to this those banks are incentivised to shift risk on to deposit insurers in two principal ways: increasing their leverage or the volatility of return on assets (Table 1).

The gist of these claims is frequently cited as evidence that deposit insurance schemes contribute to financial instability because the presence of a guarantee reduces the incentives of creditors to monitor bank behaviour and riskiness. For this reason, many scholars have recommended that deposit insurance ought to be curtailed²², or even removed.²³

However, the literature on the risk-generation aspects of deposit insurance is more agnostic than is usually presented during debates on its efficacy and there are inconsistencies in findings which undermine claims that deposit insurance generates instability. Many of the economic studies purporting to 'prove' that morally hazardous behaviour exists in the banking sector are based on the finding that systemically important firms can borrow at lower than-average cost, presumably because they are more likely to be rescued in the event of default.²⁴ This fact is reflected in studies on bank interest costs to the extent that riskier banks need to pay higher interest rates to attract depositors.²⁵ Typically, researchers find that interest rates paid on partially insured instruments, such as certificates of deposit, increase significantly with

²⁰There are wider dimensions to deposit insurance in the case of large financial institutions. For instance, the presence of deposit insurance may motivate bank managers and shareholders to adopt higher levels of risk than they would absent the insurance fund. There are a number of reasons for this, but significant drivers of such behaviour include: (i) the lack of a credible threat to senior managerial positions even where large banks are vulnerable to insolvency; and (ii) the knowledge on the part of shareholders that the instability risks associated with bank insolvency mean that the bailout of an institution is possible, or even likely. For example, see Gillian Garcia, *Deposit Insurance and Crisis Management* (2000) IMF Working Paper WP/00/57

²¹A Demirgüç-Kunt and E Detragiache 'Does Deposit Insurance Increase Banking System Stability? An Empirical Investigation' [2000] *Econometric Society World Congress 2000 Contributed Papers from Econometric Society* 1751.

²²EJ Kane, 'The Unending Deposit Insurance Mess' (1989) 246 *Science* 451.

²³CW Calomiris and M Jaremski, 'Deposit Insurance: Theories and Facts' (2016) 8 *Annual Review of Financial Economics* 97.

²⁴SL Schwarcz, 'Too Big to Fool: Moral Hazard, Bailouts, and Corporate Responsibility' (2017) 102 *Minnesota Law Review* 766.

²⁵M Flannery, 'Using Market Information in Prudential Bank Supervision: A Review of the U.S. Empirical Evidence' (1998) 30 *Journal of Money, Credit and Banking* 273.

Table 1. Deposit insurance levels in various countries.

Country	Coverage Amount (\$US) as of 4.3.2024
US	250,000
Australia	163,697
EU	108,230
Canada	73,987
China	80,000
Japan	65,878
Brazil	49,244
Switzerland	110,390
Malaysia	52,576
Hong Kong	63,869
South Korea	37,079
UK	107,268

bank riskiness.²⁶ There is evidence that where banks have the option to invest in risky assets – unlike in Diamond and Dybvig’s model – deposit insurance diminishes the incentives for depositors to actively monitor banks, which may lead to excessive risk-taking.²⁷

Other research also suggests that deposit insurance implementation weakens market discipline, leading to increased risk-taking by banks, exhibited by factors including: a reduction in the capital held by banks;²⁸ a decrease in the sensitivity of deposit rates to changes in bank risk (especially in insurance systems with broader and more extensive coverage)²⁹; higher loan-to-asset and debt-to-equity ratios resulting in more frequent bank defaults due to increased asset risk and leverage³⁰; and the issuance riskier loans with no concomitant increase in interest rates to compensate for the additional risk.³¹ Generous deposit insurance schemes tend to be associated with lower capital reserves, making banks more susceptible to economic shocks.³² While elevated and stricter capital requirements do help alleviate some of the moral hazard concerns, they may not completely eliminate them.³³

These findings however are far from uncontested; there is widespread evidence that deposit insurance schemes do not distort incentives in the ways claimed by some scholars. For instance, some research studies find no evidence that deposit insurance leads to an increase in bank failures.³⁴ Moreover, further research also fails to establish a connection

²⁶HL Baer and E Brewer, ‘Uninsured deposits as a source of market discipline: some new evidence’ (1986) 10 *Economic Perspectives* 23; TH Hannan and GA Hanweck, ‘Bank Insolvency Risk and the Market for Large Certificates of Deposit’ (1988) 20 *Journal of Money, Credit and Banking* 203-211.

²⁷R Cooper and T Ross, ‘Bank Runs: Deposit Insurance and Capital Requirements’ (2002) 43 *International Economic Review* 55.

²⁸E Nier and U Baumann, ‘Market discipline, disclosure and moral hazard in banking’ (2006) 15 *Journal of Financial Intermediation* 332.

²⁹A Demirgüç-Kunt and H Huizinga, ‘Market discipline and deposit insurance’ (2004) 51 *Journal of Monetary Economics* 375.

³⁰CW Calomiris and S Chen, ‘The spread of deposit insurance and the global rise in bank asset risk since the 1970s’ (2022) 49 *Journal of Financial Intermediation* 100881.

³¹VP Ioannidou and MF Penas, ‘Deposit insurance and bank risk-taking: Evidence from internal loan ratings’ (2010) 19 *Journal of Financial Intermediation* 95.

³²AR Fonseca and F Gonzalez, ‘How Bank Capital Buffers Vary Across Countries: The Influence of Cost of Deposits, Market Power and Bank Regulation’ (2010) 34 *Journal of Banking and Finance* 892.

³³A Hovakimian and E Kane, ‘Effectiveness of Capital Regulation at U.S. Commercial Banks, 1985–1994’ (2000) 55 *Journal of Finance* 451; JR Barth, G Caprio Jr and R Levine, ‘Bank regulation and supervision: what works best?’ (2004) 13 *Journal of Financial Intermediation* 205.

³⁴DC Wheelock and P Wilson, ‘Can Deposit Insurance Increase the Risk of Bank Failure? Some Historical Evidence’ (1994) 76 *Federal Reserve Bank of St Louis Working Paper May/June*; LJ Alston and others, ‘Why Do Banks Fail? Evidence from the 1920s’ (1994) 31 *Explorations in Economic History* 409.

between the adoption of deposit insurance and heightened risk-taking by financial institutions.³⁵ Data from episodes of financial turbulence in Argentina, Chile, and Mexico in the 1980s and 1990s demonstrates that depositors withdrew their funds and demanded higher interest rates during times of distress, effectively imposing market discipline, a finding attributable to the lack of complete credibility in deposit insurance schemes.³⁶ Other research shows that large systemically important banks do not change their risk-taking in response to the introduction of deposit insurance, which suggests that the introduction of explicit deposit insurance does not mitigate ‘too-big-to-fail’ problems.³⁷

Perhaps most significantly, the claim made in various studies in this context – namely that deposit insurance weakens financial stability – is often caveated by additional conditions; specifically, the fragility induced by deposit insurance schemes tends to subsist only in environments with shaky institutions and a weak rule of law. Multiple studies underscore the pivotal role of the rule of law in determining the effectiveness of deposit insurance. In environments with weak institutional foundations, overly generous design features tend to destabilise the banking system and undermine market discipline. In arguably the seminal study in this field, Demirgüç-Kunt and Detragiache³⁸ investigate how institutional quality measures, such as the effectiveness of regulation and supervision and the strength of the legal system, influence the impact of deposit insurance. They find that explicit deposit insurance increases the likelihood of a banking crisis, but this effect is less pronounced in countries with higher institutional quality. They conclude on this point by stating that ‘in a number of cases [of countries with strong institutional environments] ... the impact of deposit insurance on banking system fragility is no longer significant.’³⁹ Specifically, the rule of law and specific characteristics of a country’s private and public contracting environments have been shown to be significant factors in deposit insurance adoption and design.⁴⁰ Put differently, in countries with strong institutional environments, deposit insurance may not lead to additional instability because in those countries prudential regulation and supervision offset any moral hazard generated by guaranteeing bank liabilities.⁴¹ Numerous other studies confirm these findings.⁴²

³⁵GV Karels and CA. McClatchey, ‘Deposit insurance and risk-taking behavior in the credit union industry’ (1999) 23 *Journal of Banking & Finance* 105.

³⁶M Soledad Martinez Peria and SL Schmukler, ‘Do Depositors Punish Banks for Bad Behavior? Market Discipline, Deposit Insurance, and Banking Crises’ (2001) 56 *Journal of Finance* 1029.

³⁷R Gropp and J Vesala, ‘Deposit Insurance, Moral Hazard and Market Monitoring’ (2004) 8 *Review of Finance* 571.

³⁸A Demirgüç-Kunt and E Detragiache, ‘Does Deposit Insurance Increase Banking System Stability? An Empirical Investigation’ (2002) 49 *Journal of Monetary Economics* 1373–1406.

³⁹*ibid.* at 1393.

⁴⁰Hovakimian, Kane, and Laeven (2003) find that ‘the tendency for explicit deposit insurance to exacerbate risk shifting is tempered by incorporating loss-control features such as risk-sensitive premiums, coverage limits, and coinsurance. Introducing explicit deposit insurance has had adverse effects in environments that are low in political and economic freedom and high in corruption.’ See A Hovakimian, EJ Kane and L Laeven ‘How Country and Safety-Net Characteristics Affect Bank Risk-Shifting’ (2003) 23 *Journal of Financial Services Research* 177.

⁴¹As noted by Demirgüç-Kunt and Kane: ‘These results imply that the contribution of deposit insurance to bank fragility is significant in poor institutional settings, but that this effect is offset in countries whose institutional and regulatory environment is strong. Thus, where the contracting environment controls incentive conflict, effective prudential regulation and supervision can offset the adverse incentives created by deposit insurance so that moral hazard need not be worrisome.’ See A Demirgüç-Kunt and EJ Kane, ‘Deposit Insurance around the Globe: Where Does It Work?’ (2002) 16 *Journal of Economic Perspectives* 175, 186.

⁴²See D Anginer, A Demirgüç-Kunt and M Zhu, ‘How does deposit insurance affect bank risk? Evidence from the recent crisis’ (2014) 48 *Journal of Banking & Finance* 312 (finding at ‘good bank supervision can alleviate the unintended consequences of deposit insurance on bank systemic risk during good times, suggesting that fostering the appropriate incentive framework is very important for ensuring systemic stability’); Angkinand (2005) and Angkinand and Wihlborg

D. Moral Hazard: mirage or reality? the cases of Northern Rock and SVB

If the assumption that moral hazard causes financial firms to engage in excessive risk-taking is either incorrect, or misapplied in the context concerned, any proposals to abolish or limit deposit insurance might be counterproductive, and in any case unlikely to fare no better at containing the externalities associated with deposit insurance schemes ie. bank distress and failure. As I shall elaborate in this section of the article, not only is the theoretical evidence for the claim that properly designed deposit insurance induces moral hazard mixed, recent bank failures in the UK (Northern Rock) and the US (SVB) provide evidence that uninsured creditors fail in their duty to monitor bank risk-taking – something that undermines the claim that insurance begets moral hazard, including amongst the most sophisticated of monitors.

The failures of these insured institutions – in different jurisdictions, and at different points in time – offer lessons as to the putative significance of insurance on depositor behaviour. As this section will demonstrate, the fallacy that moral hazard is always generated by insurance is belied by the notion that uninsured (and, importantly, mostly unsecured) creditors of financial institutions are frequently amongst the slowest to react to bank distress. This in itself flies contrary to the notion that because such claimants are uninsured, they have the proper incentives to spot and take corrective action in relation to excessive risk-taking (unless such creditors have full confidence that their claims will be made whole, an issue that I address in my concluding remarks). Importantly, these episodes occurred in environments characterised by the presence of strong institutions and legal safeguards. Moreover the risks adopted by the banks concerned were transparent: they were not engaging in complex trading or hidden off-balance sheet financing.

I. Northern rock: 2007

Northern Rock plc (NR) was a medium-sized bank in the UK whose core business was the provision of residential mortgages, accounting for 7 percent of all mortgage leading in the country in the year prior to its failure.⁴³ Its business model was based on a structured investment vehicle: in order to sustain high growth in its assets, the bank changed the structure of its liabilities.⁴⁴ In 1999, it adopted an ‘originate and distribute model’ thanks to which the bank originates loans and purchase them from specialised brokers and securitised them via a Special Purpose Vehicle (SPV), although as noted by Shin,

(2008) also explore the influence of institutional variables like the rule of law, corruption, and shareholder rights on the relationship between deposit insurance and banking system fragility. Their findings indicate that an institutional environment conducive to effective monitoring helps mitigate the negative impact of deposit insurance on bank risk. See A Angkinand, ‘Deposit Insurance and Financial Crises: Investigation of the Cost- Benefit Trade-Off’ (2005) Claremont Graduate University Working Paper; A Angkinand and C Wihlborg, ‘Deposit insurance coverage, ownership, and banks’ risk-taking in emerging markets’ (2010) 29 *Journal of International Money and Finance* 252; Dewenter, Hess, and Brogaard reveal that the effects of deposit insurance vary based on the levels of economic freedom, the rule of law, and corruption within a bank’s home country. See KL Dewenter, AC Hess and J Brogaard, ‘Institutions and Deposit Insurance: Empirical Evidence’ (2018) 54 *Journal of Financial Services Research* 269. Cull, Senbet, and Sorge (2004) demonstrate that in weak institutional environments, deposit insurance can hinder economic growth and financial development, but that this does not hold where institutions and the rule of law are strong. See R Cull, L Senbet and M Sorge, ‘Deposit Insurance and Bank Intermediation in the Long Run’ (BIS Working Paper No 156, July 2004).

⁴³House of Commons Treasury Committee, ‘The run on the Rock’ Fifth Report of Session 2007–08: HC 56–I, 24 January 2008 (hereinafter, Run on the Rock Report).

⁴⁴DT Llewellyn, ‘The Northern Rock Crisis: A Multidimensional Problem Waiting to Happen’ in RR Bliss and GG Kaufman (eds), *Financial Institutions and Markets. 2007–2008 the Year of Crisis* (Palgrave Macmillan 2009) 101–128.

unlike in the case of US banks, NR's securitisation process did not result in large off-balance sheet entities; instead, the assets were held on-balance sheet.⁴⁵

NR's business model was accordingly based to a large degree not on attracting substantially greater volumes of deposits to fund investments, but through securitisations, covered notes issuance and wholesale funding. From June 1998 (the year following demutualisation) to June 2007 (just before the crisis), Northern Rock underwent a substantial surge in total assets, soaring from £17.4 billion to £113.5 billion. This expansion represented a consistent equivalent annual growth rate of 23.2 percent, highlighting a remarkably rapid pace of development. However, as Northern Rock expanded its mortgage assets, the scale of its balance sheet exceeded its traditional funding source of branch-based retail deposits. Despite a 6.5-fold increase in total assets during this period, retail deposits only increased from £10.4 billion to £24 billion; in 1998, retail funding constituted 60 percent of the bank's liabilities, but on the eve of the crisis in June 2007, it had dwindled to a mere 23 percent of total liabilities.

As distress in the mortgage and securitisation markets emerged in the summer of 2007, confidence in NR collapsed, leading to a run on its liabilities by retail and wholesale creditors. In September, NR reached the brink of insolvency, prompting an intervention by the UK Treasury which injected approximately £30 billion of public funds to rescue the institution.⁴⁶ The UK's Financial Services Compensation Scheme announced on October 1st, that co-insurance would be abolished for all covered banks. The FSCS ultimately paid £23.6 billion to depositors at banks that failed between 2007 and 2009.⁴⁷

1. Analysis of the NR failure

In the summer of 2007, as investors reduced their exposures to financial institutions, NR could no longer effectively use securitisations scheme in order to generate cash and unload risk by parcelling its home loans as bonds and selling them to the market. NR also lost funding from wholesale and retail depositors. Over the period of its liquidity problems which began in the second quarter of 2007, significant declines occurred in retail deposits and wholesale liabilities. Wholesale funding, denoting nonretail funding (excluding covered bonds and securitised note) saw a decrease from £26.7 billion in June to £11.5 billion in December 2007.

The maturity and sourcing of NR's wholesale funding provides evidence that wholesale funders did run from NR – but at a very late point in the life of the institution.⁴⁸ In spite of a lack of funding insurance, NR's wholesale funders were in many cases committed to medium-term funding facilities. Shin's analysis demonstrates that from the end of 2006

⁴⁵This change had a strong influence on company's strategy.

⁴⁶Although designed to stabilise financial markets, much larger failures followed in 2008, including the world's largest bank by assets, RBS. For discussion, see E Avgouleas and J Cullen, 'Excessive Leverage and Bankers Pay: Governance and Financial Stability Implications of a Symbiotic Relationship' (2015) 21 Columbia Journal of European Law 1.

⁴⁷E Vergara, 'United Kingdom: Financial Services Compensation Scheme' (2022) 4 Journal of Financial Crises 639.

⁴⁸The term 'wholesale funding' 'usually refers to the part of banks' funding that does not come from customer deposits. Neither does it include central bank funding which, under normal situations, should only represent a small part of the balance sheet. Wholesale funding is made up of a wide range of instruments such as interbank deposits, mortgage-backed securities, senior and subordinated debt.' See S Jodar Rosell, 'The cost of bank debt: a thing of the past' 13 October 2014, Caixa Bank Research, <https://www.caixabankresearch.com/en/economics-markets/financial-markets/cost-bank-debt-thing-past>.

to mid-2007, NR actually raised a net £2.5 billion of wholesale funding in the first-half of 2007⁴⁹, before 'substantial outflows of wholesale funds as maturing loans and deposits were not renewed [resulting] in a full year net outflow of £11.7 billion.'⁵⁰ Whilst it was the withdrawal of wholesale funding which began NR's rapid decline, many uninsured wholesale funders were not in a position to 'run' at all; indeed, as shown above, NR's wholesale funding position (which was in September 2007 effectively guaranteed by the British state) still stood at £11.5 billion. Of course, some wholesale funders managed to pull funding before capital markets seized up in August 2007, effectively by not rolling over their medium-term and short-term funding facilities. Yet, a significant proportion – comprising arguably the most sophisticated categories of investors did not pull their funding until it was far too late and the institution had effectively collapsed.

As Shin notes, NR's retail deposits were 'actually the most stable of all'⁵¹; yet this is precisely the behaviour one might expect from insured depositors. Most retail deposits in NR were fully covered, so the incentive to run was contained, until much later in the summer of 2007, when it appeared that NR would fail completely. In these circumstances, insured retail depositors did indeed run, resulting in the withdrawal of funding detailed above. However, the proximate cause of the retail depositor run was, according to the then Bank of England the 'markedly inferior [and] inadequate' deposit insurance system, which meant that should a UK financial institution approach insolvency (at the time of the NR failure) 'depositors might have to wait a considerable time to gain access to their funds, so they would have a strong incentive to join a bank run.'⁵² Under the insolvency arrangements in force at the time, retail depositors would be regarded simply as unsecured creditors, even if their deposits were insured. Most retail investors in banks do not have access to funds elsewhere, and this lack of diversification means they are especially vulnerable to delays in insurance payouts.⁵³

Moreover, this does not explain why so-called sophisticated investors – whose claims did not enjoy any insurance whatsoever – did not run from NR sooner. According to the moral hazard framework outlined above, markets ought to have been exerting much greater discipline upon financial institutions such as NR, especially in view of the 'high-risk' business model it was operating under in the summer of 2007. Yet, most markers of monitoring did not begin to flash red until well into 2007.

The share price of the bank did begin to decline in February 2007, approximately six months prior to its collapse (dropping approximately 16% in the first half of the year) although the fall did not become precipitous until June 2007 when NR issued a profits warning.⁵⁴ In spite of this profits warning, NR announced on 25 July, an increase in its

⁴⁹H Song Shin, 'Reflections on Northern Rock: The Bank Run that Heralded the Global Financial Crisis' (2009) 23 *Journal of Economic Perspectives* 101.

⁵⁰Northern Rock plc Annual Report 2007, 31.

⁵¹Shin (n 49) 109-110.

⁵²Run on the Rock Report (n 43) at 197, 81. As noted by the Parliamentary committee, as of 2007: 'The UK's current resolution system ranks bank depositors alongside other unsecured creditors, which would mean that a failed bank's depositors would have to wait months, maybe even years, before receiving their insured deposits through the depositor protection scheme.'

⁵³The UK's then prevailing limit of £35,000 covered all of at least 90% of bank deposits and more than that in the case of Northern Rock. Moreover, 'it is clear that depositors require continuing access to their deposits. While a short break may not matter to them, not receiving their pay, having standing orders and direct debits collapse and running out of cash will not be acceptable. The amount of inconvenience does not need to be large to exceeding the switching costs.' See DG Mayes and G Wood, 'The Northern Rock Crisis in the UK' (2008) 114 *Économie internationale* 5.

⁵⁴Run on the Rock Report (n 43) at 39.

interim dividend of 30.3%.⁵⁵ This temporarily stabilised the share price, yet the bank was just six weeks away from insolvency.

Other indicators of potential distress similarly reacted late, given the substantial exposures many investors had to the bank. In an important study, Hamalainen et al. consider the reactions of investors and traders through an analysis of forward-looking market prices to identify whether markets reflected the risk of failure of NR.⁵⁶ Their study, inter alia, examined the signalling qualities of four financial market instruments (credit default swap spreads, subordinated debt spreads, implied volatility from options prices and equity measures of bank risk) in order to evaluate the individual qualities of each instrument. The authors claim that 'private market participants did signal impending financial problems at Northern Rock.'⁵⁷ They base this on the following evidence:

- (i) NR's share price fell consistently from approximately February 2007 onwards, in spite of being the best performing share price in the banking sector in 2006;
- (ii) NR's equity trading volumes were higher ('abnormal') than peer competitor banks, and the implied distance-to-default on NR equities became more pronounced following the profits warning it issued in June 2007;
- (iii) NR forward-looking options became more volatile between June and December 2007 (implied volatility, or IIV); and
- (iv) Credit default swap spreads widened in relation to all UK banks, including NR, in the period after June 2007, albeit from very small bases.

Whilst the authors of this study claim that this support private market monitoring, we dispute that the evidence asserted supports this conclusion. In particular, one would expect most of these measures to react in some way to the issuance of a profit warning. Copious financial literature studies market reactions to profits warnings (or similar indications of corporate distress) and finds (not unexpectedly) that market measures of risk increase in the period following such announcements.⁵⁸ This does not – at least to us – provide convincing evidence that creditors to NR were exhibiting any market discipline; instead, much of this reaction occurred *ex post*, following the release of information unique to NR to the market⁵⁹, which would be expected to generate such behaviour. Given that the majority of these indicators began to react a mere two and a half months prior to the total collapse of the institution is not strongly indicative of investor

⁵⁵*ibid.* at 44.

⁵⁶P Hamalainen and others, 'Did the Market Signal Impending Problems at Northern Rock? An Analysis of Four Financial Instruments' (2012) 18 *European Financial Management* 68.

⁵⁷*ibid.*

⁵⁸For example, see RAK Cox and others, 'The Bad, the boom and the bust: Profit warnings over the business cycle' (January–February 2017) 89 *Journal of Economics and Business* 13–19, finding that 'the average PW is associated with a -13.38% abnormal return during the announcement day'; D Jackson and J Madura, 'Profit Warnings and Timing' (2003) 38 *The Financial Review* 497–513, finding that '[s]hare prices begin to adjust about five days before a profit warning, and the market response is not complete until about five days after the warning. The accumulated response over the 11-day period ending five days after the announcement is -21.7%'; see also G Bulkley and R Herrerias, 'Does the Precision of News Affect Market Underreaction? Evidence from Returns Following Two Classes of Profit Warnings' (2005) 11 *European Financial Management* 603, finding that '[s]tock prices drop on average by approximately 22% in the announcement window for a profit warning.'

⁵⁹As the authors note: 'bank-specific signs only became apparent after NR issued a profits warning in late June 2007. It is at this stage that the bank explained how funding mismatches would prevent analysts' profit forecasts from being met.'

discipline, given that NR's business model had been consistently high-risk for some time prior to its failure.⁶⁰ As the authors themselves concede, many market-based measures of risk did not treat NR as especially risky in comparison to rival institutions. Ex ante monitoring was therefore largely absent.

Even more significantly in the context of this article, whilst Hamalainen et al's study finds very weak evidence of monitoring in relation to some financial indicators, they find that the reaction of wholesale funders – specifically subordinated debt holders (SNDs) – placed no discipline on NR or its risk-taking at all. SND holders sit at the bottom of the repayment hierarchy if the borrowing company faces insolvency, ranking with other unsecured creditors. In such circumstances, wholesale funders are frequently extolled as the most likely class of investors to exert market discipline on debtors: SND holders have maximal incentives to monitor and limit bank risk-taking, because they will likely suffer losses – potentially total loss – should a bank fail. For these reasons, according to Evanoff, using such instruments as funding mechanisms has the potential to forestall systemic bank runs:

the ideal situation would be one in which discipline is imposed by the marketplace, but bank deposit runs would not occur. It is possible to devise such an environment. In fact, it is quite easy. It can be achieved by using subordinated debt as the instrument to cushion the deposit insurance fund and to impose discipline on financial firms. Market forces can serve as an effective complement to regulatory discipline; stability of the banking system (not its individual components) is of paramount concern; and the current means used to price deposit insurance (i.e. risk invariant, flat rate premiums) and resolve bank failures are inadequate.⁶¹

Thanks to this line of thinking – as well as favourable regulatory treatment of subordinated debt – by 2007, UK banks were the second largest class of SND issuers in the world, second only to banks in the US.⁶² Remarkably, Hamalainen et al's study finds that NR's 10-year SND spreads actually *declined* between 2006 and the June 2007 profits warning. Even after the profits warning, it took until August 2007 – fully two months later – for NR's SND spreads to widen significantly.

Given that SND holders were still providing funding to NR on a 10-year basis at decreasing yields until at least late summer 2007, and that this class of investors, together with depositors were most at risk from loss should NR fail, the notion that relying on unsecured funders – those with the most to lose from a failure – to impose market discipline is not supported. In circumstances such as this, if the moral hazard framework held, such creditors would have been sounding the alarm about NR's increased riskiness at a much earlier point in time, not continuing to extend uninsured and multi-year duration funding to the institution on ever-more generous terms.⁶³

⁶⁰See Run on the Rock Report (n 43) t.

⁶¹DD Evanoff, Subordinated Debt: The Overlooked Solution for Banking, Chicago Fed Letter, No. 45, May 1991, <https://www.chicagofed.org/publications/chicago-fed-letter/1991/may-45>; See also D Evanoff and L Wall, 'Reforming bank capital regulation: using subordinated debt to enhance market and supervisory discipline' (2001) 19 Contemporary Economic Policy 444.

⁶²Hamalainen and others (n 56) 79.

⁶³According to the Run on the Rock report, of NR's wholesale borrowings, half of it had a duration longer than one year and the other half was less than one year's duration. See Run on the Rock (n 43) at 13.

II. SVB bank

Silicon Valley Bank (SVB) was established in 1983 with a focus on serving the needs of startup companies. SVB structured its loans based on the understanding that many startups lack immediate revenue. The bank managed risk by connecting clients with its extensive network of venture capital, law, and accounting firms. SVB's strategy involved collecting deposits from businesses financed through venture capital and later expanding into banking and financing for those depositors. The bank prioritised funding startups backed by top-tier venture capital firms to reduce risk.⁶⁴

During the 1980s, SVB experienced significant growth, achieving 21 consecutive quarters of profitability, growing in tandem with the expanding local high-tech economy. SVB played a crucial role during the dot-com bubble, lending to venture-stage companies. SVB entered the private banking business in 2002, leveraging its relationships with wealthy venture capitalists and entrepreneurs. By 2015, the bank claimed to serve 65% of all U.S. startups, introducing new offerings like syndicated loans and foreign currency management.

SVB, as stated on its website, offered banking services tailored for 'innovators, entrepreneurs, and investors,' serving nearly half of all U.S. venture-backed technology and life sciences companies. Consequently, SVB's clientele was predominantly composed of venture capital-backed (VC-backed) and early-stage startup enterprises.⁶⁵ As of 31 December 2022, 56% of SVB's loan portfolio consisted of loans to venture capital and private equity firms, secured by their limited partner commitments. An additional 14% comprised mortgages to high-net-worth individuals, while 24% were allocated to technology and healthcare companies. Notably, 9% of all loans were dedicated to early and growth-stage startup companies. SVB required an exclusive relationship with those borrowing from the bank. In February 2023, Forbes ranked SVB as number 20 among 'America's Best Banks' citing a 13.8% return on equity. In March 2023, Moody's Investors Service rated the bank's loan portfolio as conservative and high-performing.⁶⁶

1. Analysis of the SVB failure

From 2019 to 2021, SVB tripled in size, compared to 29 percent for the wider US banking industry.⁶⁷ Its deposits increased from \$62 billion in March 2020 to \$124 billion in March 2021. Low interest rates played a significant role in amplifying this growth, although deposits at SVB surged also through increased VC activity which characterised the post-Covid economic rebound.

As of mid-2022, SVB asset growth slowed dramatically as tech-sector activity fell away. SVB was uniquely exposed to this slowdown, thanks to the symbiotic relationship it enjoyed with VC firms, which were heavily affected by the increased interest rate environment and inflation of 2021-2023. As VC activity declined in 2022, firms began pulling funding from SVB in order to fund business activity.

⁶⁴M Calvey, 'Who will fill the void for startups in the wake of Silicon Valley Bank's failure?' (*San Francisco Business Times*, 14 March 2023): <https://www.bizjournals.com/sanfrancisco/news/2023/03/14/silicon-valley-bank-fill-the-void-jpmorgan-chase.html>.

⁶⁵Review of the Federal Reserve's Supervision and Regulation of Silicon Valley Bank - April 2023 (hereinafter Fed Review) <https://www.federalreserve.gov/publications/2023-April-SVB-Evolution-of-Silicon-Valley-Bank.htm>.

⁶⁶K Kokalitcheva, 'The rise and stunning fall of Silicon Valley Bank' (*Axios*, 11 March 2023): <https://www.axios.com/2023/03/11/silicon-valley-bank-rip>.

⁶⁷SVB's assets grew 271 percent from year-end 2018 to year-end 2021. See Fed Review (n 65).

The effects on SVB of the slowdown in economic activity over this period were compounded by the structure of SVB's investment portfolio. SVB invested a large slice of its deposits in long-dated, held-to-maturity (HTM) government securities. According to the Fed, at the end of 2022, SVB's securities portfolio had a weighted average duration of 6.2 years.⁶⁸ Included amongst this portfolio was a significant volume of agency MBS with a maturity of 10 years or more, which were also HTM. These factors rendered SVB's assets extremely vulnerable to interest rate (duration) risk, making it difficult for the bank to rebalance its portfolio in response to changes in monetary policy. Given these heavy concentrations, as interest rates began to rise, SVB began to see a rapid increase in its marked-to-market losses on all of its portfolios.

SVB's exposure to interest rate risk was exacerbated by the contraction in the tech sector which occurred as interest rates increased in 2022. As deposit outflows from tech firms continued, in late February 2023, the Financial Times highlighted that SVB was sitting on approximately \$15 billion in unrealised losses on its HTM securities.⁶⁹ On 8 March 2023, SVB announced a balance-sheet restructuring, including the sale of \$21 billion of securities at a \$1.8 billion loss.

The announcement by SVB led to a panic amongst depositors, the vast majority of whom were uninsured. In the event, as a result of the depositor run, by the end of 9 March SVB had lost over \$40 billion in deposits, with an additional \$100 billion expected the following day. As a result, SVB was closed on the morning of 10 March, and the FDIC appointed as receiver. All depositors in SVB were guaranteed in full by the FDIC. This included uninsured deposits, which comprised 94 percent of SVB's deposit base. Any shortfall in the costs of winding down SVB (and other failed institutions over that period) would be met by the FDIC deposit insurance fund; if necessary, that fund is to be replenished by a 'special assessment' imposed on remaining insured banks.⁷⁰

As with NR, the SVB episode demonstrates that even where market discipline eventually arrives, it does so rapidly but very late. SVB's creditors – in this case comprised mostly of large uninsured depositors – exerted no discipline on the bank in the years leading up to its failure, in spite of the many examples of poor risk management exhibited by the institution. The proximate cause of the bank's failure was the lightning-fast deposit outflows which occurred in early March, but the seeds of its instability were sown much earlier in the economic cycle. As 2022 ended, SVB's securities portfolio relative to its total assets was around double the size of comparable large US banks and its HTM portfolio as a percentage of total securities was also around double the size of its peer group. Its uninsured deposits as a percentage of total deposits were more than double its competitors' average, comprising 94 percent of its deposit funding.⁷¹ SVB failed to manage its exposure to interest rate risk; in fact it actively removed hedges against such risk as rates rose.⁷² It was also left highly exposed to liquidity risk: virtually all of its funding sources were concentrated in large deposits from the highly cyclical technology and VC sectors.

⁶⁸Fed Report here: <https://www.federalreserve.gov/publications/2023-April-SVB-Evolution-of-Silicon-Valley-Bank.htm>.

⁶⁹T Kinder and others, 'Silicon Valley Bank Profit Squeeze in Tech Downturn Attracts Short Sellers' (*Financial Times*, 22 February 2023) <https://www.ft.com/content/0387e331-61b4-4848-9e50-04775b4c3fa7>.

⁷⁰FDIC, 'FDIC Acts to Protect All Depositors of the former Silicon Valley Bank, Santa Clara, California' Press Release, 13 March 2023, <https://www.fdic.gov/news/press-releases/2023/pr23019.html>.

⁷¹Data derived from SVB's 31 December 2022, Call Report and SVBFG's 31 December 2022, Consolidated Financial Statement for Holding Companies (Form FR Y-9C).

⁷²Fed Review (n 65).

Not only this, but investors were aware that SVB had been placed under supervisory review in 2021, following an examination by the Large and Foreign Banking Organisation Supervisor (LFBOS) under the auspices of the San Francisco Fed.⁷³ In its preliminary review of SVB, the LFBOS found a number of deficient supervisory practices, and proposed a downgrade of the CAMELS liquidity component rating, as well as requiring other identified issues to be addressed within six months.⁷⁴

In March 2022, FRB San Francisco examiners reviewed risk management and governance arrangements at SVB. It found, *inter alia*, that ‘the board of directors did not provide effective oversight to ensure that senior management implemented risk management practices commensurate with the institution’s size and complexity.’⁷⁵ More significantly, in June 2022, the FRB San Francisco issued a report highlighting the high level of unrealised losses on both HTM and available-for-sale securities at US banks following the interest rate increases of the previous six months. The FRB examiners identified SVB as one of the outliers in the US banking system, because of its exposure to such securities and its large HTM portfolio. They also placed SVB on the Systemwide holding company watch list, with a high adverse change probability warning, indicating that there was a high likelihood of a supervisory rating downgrade.⁷⁶ Following this, the Fed and FRB San Francisco downgraded the bank’s CAMELS composite and other ratings in August 2022.⁷⁷

In November 2022, the FRB of San Francisco issued a supervisory letter which noted that SVB’s Interest-Rate Risk (IRR) simulations were unreliable, and that this deficient IRR modelling directly led the bank’s management and board of directors to believe incorrectly that rising interest rates would affect the bank’s profitability positively. In early 2023, SVB was placed under ‘horizontal review.’⁷⁸ Supervisors were aware of the toxicity exerted on bank balance sheets by rising interest rates: according to a Federal Reserve report, SVB’s financial position was highlighted to the Board of Governors in February 2023 in the following terms:⁷⁹

- (1) as of the third quarter of 2022, total unrealised losses amounted to 110 percent of capital;
- (2) SVB lost nearly 8 percent of its deposits since the onset of rising interest rates;
- (3) SVB was executing on its contingency funding plan to maintain appropriate liquidity; and
- (4) the institution’s IRR measurement system failed to estimate sensitivity to rising rates, resulting in higher funding costs.

⁷³Board of Governors of the Federal Reserve System, ‘Material Loss Review of Silicon Valley Bank, Evaluation Report, 2023-SR-B-013’ (25 September 2023).

⁷⁴The CAMELS is an international supervisory system based on rating six factors: capital adequacy, asset quality, management, earnings, liquidity, and sensitivity.

⁷⁵Letter from Federal Reserve Bank of San Francisco, California Department of Financial Protection and Innovation to Board of Directors of SVB Bank (31 May 2022) (BOG-FRS Public Release, April 2023) at: <https://www.federalreserve.gov/supervisionreg/files/svbf-g-and-svb-governance-and-risk-management-target-supervisory-letter-20220531.pdf>.

⁷⁶See n73.

⁷⁷*ibid*.

⁷⁸Horizontal Reviews are conducted by the Federal Reserve, and normally comprise an examination of a common risk factor across several firms simultaneously. See <https://www.federalreserve.gov/publications/2019-may-supervision-and-regulation-report-supervisory-developments.htm#:~:text=The%20Federal%20Reserve%20conducts%20various,on%20the%20largest%20financial%20institutions.>

⁷⁹Material Loss Review of SVB (n 73) 29.

The creditor inertia in relation to SVB is even more remarkable given the attrition in value in its HTM portfolio over the course of 2022. At the close of 2022 – barely two months before its failure – SVB’s HTM securities portfolio was valued at over \$15 billion below its deposit liabilities. Whilst SVB had retained almost \$17 billion in equity at this point in time and was therefore not technically balance-sheet insolvent, investors gave off few signals concerning the bank’s precarious financial position. Moreover, as with many of the episodes discussed, those creditors with most to lose – uninsured creditors – did little to exert any meaningful influence on the bank’s decision-making, nor did they react to the multiple supervisory warnings about SVB’s vulnerability to changes in interest rates. Only when SVB itself admitted to the market that it required an equity injection did the uninsured creditors react.

Further red flags in relation to SVB’s balance sheet risk are evident if one examines other aspects of SVB’s positions. For example, although SVB reported a healthy capital ratio consistently in the lead up to its failure, its adjusted net leverage ratio (NLR) deteriorated sharply throughout 2022. At the end of March 2022, for example, its NLR was 2.2 percent, well below the 5 percent minimum required by regulators for a bank to be deemed ‘well-capitalised’, and below the 4 percent regulatory minimum. By the mid-point of 2022, SVB’s NLR was just 0.3 percent, and by the third quarter, its NLR was negative.⁸⁰

And yet, market discipline failed to appear throughout 2021 and 2022. SVB’s equity price remained stable from the end of 2021 until 2023, outperforming the index for comparable banks, as well as the S&P 500 index, only later being impacted by the slowdown in tech sector activity. According to the Fed:

Until SVB’s announced restructuring actions on March 8, 2023 ... SVB’s equity price had been relatively stable before deteriorating sharply following the balance sheet restructuring. As of March 1, 2023, most equity analysts covering financial institutions rated SVBFG a ‘Buy’ (12) or ‘Hold’ (11) vs. ‘Sell’ (1).⁸¹

Similarly, credit ratings agencies held a stable outlook on SVB debt, with ratings barely moving between 2015 and March 2023. Moody’s had not altered SVB’s credit rating since 2007.⁸²

E. Discussion

The lessons from the NR and SVB failures are legion, and in analysing the common features of these rescues, a more complete understanding of the nature of the modern banking systems in the UK and US emerges. Many of these discussions are outside the bounds of this article, although it is worth dwelling briefly on three striking similarities between the two experiences, before spending further time analysing the consequences for the banking system as a whole.

The first is that the banks discussed in this article grew extremely rapidly in the run-up to their respective failures. In each case, this was partially attributable to the prevailing

⁸⁰SG Cecchetti and KL Schoenholtz, ‘The Extraordinary Failures Exposed by Silicon Valley Bank’s Collapse’ (20 March 2023) at: <https://www.moneyandbanking.com/commentary/2023/3/20/the-extraordinary-failures-exposed-by-silicon-valley-banks-collapse>.

⁸¹Fed Review (n 65) 25.

⁸²ibid.

macroeconomic environment: in the case of NR, a European and US real-estate boom, and in the case of SVB a tech-sector and venture capital driven expansion. The rapid growth experienced at NR and SVB, albeit in different contexts, did not alert market participants – including creditors to each institution – to the liquidity risks that each bank was exposed to should the respective booms slow down or reverse. Moreover, the rapid growth in highly-concentrated portfolios of the banks concerned – mortgages in the case of NR and treasury securities in the case of SVB – left each bank exposed to downturns in those respective markets.

Secondly, on the flip-side, regulators in each case were slow to react to the expansions concerned. Rapid expansions are often accompanied, or driven by, increased risk-taking, yet regulators paid insufficient attention to these potential risks. This was particularly notable in the UK, where NR was granted a waiver for capital planning purposes by its regulator, the Financial Services Authority, in June 2007, allowing it to pay a dividend just three months prior to its failure.⁸³ In the US, regulators were more intrusive in relation to SVB but still failed to act promptly to require SVB to restructure its liabilities and diversify its funding sources. These regulatory failures were undoubtedly factors in the respective collapses, but merely reflect broader attitudes to risk management in the banking sector discussed earlier.

Thirdly and most significantly in the context of this article, creditors to both NR and SVB did not fulfil their role(s) as monitors, at least until the very last moment. Deposits were withdrawn from both NR and SVB, but these deposit outflows were slow to begin, and did not occur for many months even after other measures of risk became acutely elevated. As discussed above, the theory of moral hazard posits that the absence of insurance will ensure that parties exposed to potential loss (especially where that loss would lead to ruin) actively monitor their counterparties. In the case of SVB in particular, uninsured creditors – many of whom were sophisticated by most definitions – failed to take action to push bank management to solidify the balance sheets of the respective institutions. In the event, NR's creditors were made whole by the UK Treasury at a cost of some £30 billion, whilst the vast majority of SVB's creditors were rescued by the state-backed FDIC.

There are a number of implications which flow from the discussions above. Perhaps the most glaring is that the notion that creditors exposed to uninsured losses – even where those contingent losses may be enormous – do not fulfil the function ascribed to them in textbook accounts of moral hazard. Although this article has analysed just two cases of such creditor delinquency, the recent historical record is littered with episodes where financial institutions were not sufficiently disciplined by market monitors. Perhaps most notably, the GFC revealed that most of the largest institutions comprising the US financial sector were exposed to claims backed by insurance companies (most notably AIG), yet none of them had exerted sufficient monitoring to check that those counterparties had sufficient collateral to satisfy their obligations under those insurance contracts. In the event, the US financial system was rescued by the US government, with several large

⁸³As noted by the UK Parliament: 'The Basel II waiver, and the dividend increase this allowed to Northern Rock, came at exactly the wrong moment. While we accept that Basel II is a capital accord and the problems at Northern Rock that soon became all too evident were ones of liquidity, it was wrong of the FSA to allow Northern Rock to weaken its balance sheet at a time when the FSA was itself concerned about problems of liquidity that could affect the financial sector.' See the Run on the Rock Report (n 43) at 45.

institutions receiving direct bailouts.⁸⁴ In tandem, in a familiar story, all deposits across the banking system in the US, UK and other territories, were guaranteed by respective governments. These episodes are not isolated: in numerous cases of recent financial system turmoil, creditors have remained delinquent in their monitoring functions.

If it is the case that any time large financial institutions in the US or UK⁸⁵ are threatened by insolvency, that the respective authorities are compelled to guarantee their liabilities, then those liabilities are de facto guaranteed by the state, even where explicit deposit insurance schemes subsist. It is not the contention of this article to debate the merits or otherwise of such a system; it merely states the extant position. NR and SVB were by no means systemically important in terms of asset size to their respective jurisdictions but fears of contagion in each case led to regulatory intervention. Bank deposits remain by far the most significant medium of exchange in modern economies, and economies with large financial systems are vulnerable to the consequences of banking panics, thanks not least to the centrality of banks to the payments system, and the dependence for economic growth on bank-generated credit, as well as the pivotal role played by banks in real estate markets. Recessions instigated by banking sector turmoil are generally much longer and deeper than recessions of other varieties⁸⁶, and it is therefore unsurprising that the authorities wish to prevent or mitigate financial crises when they occur. In these cases unsecured creditors are bailed out, destroying the foundation of any claims concerning moral hazard.

1. Insuring all bank deposits

In acknowledging these truths, policy options emerge. For example, given that in the interests of financial stability banks enjoy an implicit guarantee of their deposit bases – and any putative legal limit on this coverage is often abandoned in the face of systemic disruption – it is unclear why bank deposits should not be insured *in toto*.

This runs counter to the received wisdom in the academic and policy circles. In such circles, established systems of co-insurance are favoured – whereby a certain proportion of deposits are covered by the guarantee (so-called retail deposits) whilst larger (commercial) deposits are left uninsured, in this case to provide incentives for more sophisticated parties to engage as monitors.

However, this article has already demonstrated that bank depositors, both large and small, routinely fail in their role as monitors of bank activities. In these circumstances, governments must step in to guarantee deposits on a wholesale basis to prevent systemic risk, or to stop the distress of large depositors from bleeding into the wider economy. Moreover, co-insurance systems fail in practice to cure the disease contemplated in any case, as in not offering protection, the largest uninsured depositors have the incentives to run on a fragile institution, and these are precisely the depositors that one must prevent from running in the first place: as Goodhart notes ‘[I]ndeed, it is exactly those

⁸⁴According to Deborah Lucas, MIT Sloan distinguished professor of finance at the MIT Golub Center for Finance and Policy, an accurate measure of cost requires taking a fair value approach - one that considers the full range of future gains and losses, and that recognizes the cost of that risk – which reveals that the total direct cost of crisis-related bailouts on a fair value basis was about \$498 billion, which amounted to 3.5 percent of gross domestic product in 2009. See DJ Lucas, ‘Measuring the Cost of Bailouts’ (2019) 11 Annual Review of Financial Economics 85.

⁸⁵The use of the word ‘large’ is questionable in the cases of both NR and SVB.

⁸⁶F Boissay, F Collard and F Smets, ‘Booms and banking crises’ (BIS Working Papers No 545, February 2016).

classes of depositors, who have the information and incentive to check the conditions of the banks with whom they place their money, who are most likely to initiate a stampede of withdrawals.⁸⁷

The introduction of blanket bank deposit insurance coverage would of course eliminate depositor bank runs – both retail and wholesale – making the system panic proof. Yet the removal of the cap would have at least four further financial stability inducing benefits:

1. Higher levels of control of monetary policy for central banks

Central banks would be accorded more control over monetary policy if an influx of bank deposits accompanied the removal of any deposit insurance limit. Monetary authorities place caps – via monetary policy – on the quantity of bank money that banks may issue. The central bank generally conducts monetary policy via the rate paid on bank reserves, controlling short-term interest rates by adjusting the amount it remunerates reserves held by member financial institutions dependent upon its monetary policy stance. Raising interest rates in general leads to a reduction in demand for credit – particularly bank loans – and the monetary authorities use the interest they pay on bank reserve holdings to manipulate short-term rates.⁸⁸

Assuming that the removal of a deposit insurance cap would result in a rebalancing of portfolios amongst large institutional investors toward bank deposits, controlling short-term interest rates would become an easier task for central banks because sources of money would become less dispersed and therefore monetary aggregates easier to manipulate.

2. Increased competition in the banking sector

there is substantial evidence that depositors – both large and small – choose larger banks over smaller competitors to deposit their funds because of the implicit guarantee enjoyed by the largest institutions. Empirical evidence illustrates that the associated risk is not fully reflected in the cost of acquiring uninsured funding for large banks deemed systemically vital by the market (Acharya, Anginer, and Warburton, 2017). The expectation of market support can result in moral hazard issues, manifesting as excessive and correlated risk-taking, similar to the challenges associated with deposit insurance.

Implicit guarantees protect creditors from banks' credit risk without being explicitly priced. This lack of pricing leads to underestimation of the guarantees' value and results in economic costs. While explicit coverage varies, implicit coverage is presumed to exist universally, historically resulting in few losses for depositors during bank failures. Public authorities are generally not obliged to intervene in private deposit insurance shortfalls. Consequently, larger banks may operate with limited market discipline, irrespective of whether an explicit insurance scheme safeguards depositors.

Quantifying the value of implicit guarantees is challenging due to uncertainty regarding covered liabilities and potential support. Nevertheless, estimates suggest significant value, equivalent to around 1-3% of GDP, with persisting funding cost advantages for

⁸⁷CAE Goodhart, 'Bank insolvency and deposit insurance: a proposal' in P Arestis (ed.), *Money and Banking: Issues for the Twenty-First Century* (MacMillan 1993) 77, 88.

⁸⁸Federal Reserve Bank of New York, 'Monetary Policy Implementation' at <https://www.newyorkfed.org/markets/domestic-market-operations/monetary-policy-implementation>.

banks, despite indications of diminishing advantages in certain countries. Moreover, those costs are more significant in the case of larger banks: since they are often perceived to be too-important-to-fail and therefore will inevitably be rescued if they are threatened by failure, depositors and other creditors provide funding at cheaper rates than those enjoyed by their smaller counterparts. Whilst this implicit subsidy varies in economic value over time, it is significant enough to be measurable.⁸⁹ One consequence is that smaller banks must, in general, pay higher funding costs to creditors, making them less competitive. It further means that, during periods of system-wide financial instability, deposits may flow away from peripheral institutions to their largest competitors, as market participants believe that larger institutions are most likely to be protected from failure.⁹⁰

3. Diminished demand for non-bank credit intermediation

A further stability-enhancing consequence of a migration of credit claims to the regulated banking system would be an immediate diminishing of the appetite for liquidity demand in the so-called shadow banking system. The emergence of the shadow banking system can be traced to a large extent to the unavailability of insured financial claims for large institutional investors.

The shadow banking system relies on secured lending, which fulfils at least two critical roles: (i) it gives borrowers incentives to repay under the contract to avoid forfeiting it; and (ii) it provides a lender with loan insurance by permitting the liquidation of the collateral in the event that the borrower defaults. This is vital in a market in which asset valuations are continually marked-to-market and where funding needs change rapidly. Indeed, the evolution of the shadow banking system is precisely a response to the need for a fluid, short-term and informationally insensitive debt market whose claims are exchangeable at par on demand with central bank money, providing liquidity for risk-averse institutions which do not have access to central bank funding or insurance.⁹¹

These forms of shadow money are collateralised by assets as security for payment: the function of the collateral is to guard against non-repayment of funds. Large institutions including asset managers and other investors managing large cash volumes use the shadow banking system as an alternative to bank deposits because, unlike bank deposits, a form of default insurance is generated by collateralisation. The activities of the shadow banking system may generate excessive leverage, especially in the form of off-balance sheet transactions. Indeed, because shadow banking units are frequently owned or sponsored by traditional banks, or are linked to them via broker-dealer activities, stress in the shadow banking system can rapidly spill into the regulated banking sector. However, unlike regulated banks, shadow banking institutions have no recourse to public sources of liquidity.

Importantly, as noted, one of the fundamental drivers of the growth of the unregulated financial system has been the unavailability of alternative stores of value exceeding the deposit insurance limit. Econometric research by the IMF has found that the most

⁸⁹For extensive discussion, see United States Government Accountability Office, 'Large Bank Holding Companies: Expectations of Government Support, Report to Congressional Requesters GAO-14-621' (July 2014).

⁹⁰K Pistor, 'A Legal Theory of Finance' (2013) 41 *Journal of Comparative Economics* 315.

⁹¹B Holmstrom, 'Understanding the role of debt in the financial system' (BIS Working Papers No 479, January 2015).

significant factor in the expansion of the shadow banking system has been the search by cash-rich investors for alternatives to bank deposits. In their words:

shadow banking grew from the demands of so-called institutional cash pools for alternatives to insured deposits and safe assets ... this, too, can be regarded as a special case of a reaction to regulations (that is, limits on deposit insurance) in an environment of ample liquidity ... bank regulation, now in the form of limits on deposit insurance ... contributes to demand because the limits induce large depositors to seek higher-seniority claim status with nonbank institutions that offer liquidity similar to that of bank deposits.⁹²

As volumes of cash grow in advanced economies and the protection afforded by deposit insurance is eroded, it is expected that more money-like debt claims will be created in the unregulated shadow banking system. Instating an unlimited deposit insurance limit would, in theory, remove the need for the non-bank credit intermediation system, thereby reducing risk across the financial system. Functionally, the proposal reflects the proposals of Ricks, who has argued that only regulated banks ought to be permitted to create money-like claims.⁹³

4. Simplification of bank regulation

Insuring all bank deposits would remove a layer of complexity in extant bank regulation. Current liquidity regulations – most significantly the Liquidity Coverage Ratio (LCR)⁹⁴ – require banks to maintain a high proportion of so-called High Quality Liquid Assets (HQLA) to cover potential anticipated net cash outflows over a 30-day stressed period. These rules are designed to prevent solvent banks from failure by ensuring that they have sufficient assets on hand to sell in the event of disruptions to their funding. There are a number of forms of HQLA; the most significant are central bank reserves, high-grade government bonds, and other forms of government-backed bond (for example mortgage agency securities).⁹⁵

Given the fact that the large part of bank funding would be invulnerable to runs the necessity to hold risk-free assets to liquidate in the event of funding disruptions would diminish considerably. Modifying deposit insurance coverage limits would reduce the requirement to monitor bank funding sources by regulators under instruments such as the LCR. Liquidity regulations would thereby be largely redundant assuming all deposits were guaranteed by an insurance fund. Accordingly, costs both to public agencies and to the institutions themselves would reduce. Resources currently devoted to monitoring bank liquidity levels would be diverted to the more complex task of bank asset examinations.⁹⁶ Moreover, by removing the obligation for banks to hold long-term low-risk

⁹²IMF Global Financial Stability Report: Risk Taking, Liquidity, and Shadow Banking – Curbing Excess While Promoting Growth: Shadow Banking Around The Globe: How Large, And How Risky? (October 2014) 75, 81.

⁹³M Ricks, *The Money Problem* (University of Chicago Press 2016).

⁹⁴Basel Committee on Banking Supervision, 'Basel III: The Liquidity Coverage Ratio and liquidity risk monitoring tools' (January 2013).

⁹⁵According to the Basel Committee: 'This standard aims to ensure that a bank has an adequate stock of unencumbered HQLA that consists of cash or assets that can be converted into cash at little or no loss of value in private markets, to meet its liquidity needs for a 30 calendar day liquidity stress scenario.' *ibid.* at 16.

⁹⁶Evidence suggests that in the cases of SVB that bank examiners recognised that some banks during the monetary tightening were exposed to significant interest rate risk but lacked the authority to compel those banks to reduce risk: 'We find that bank supervisors were aware of the interest rate risks that were emerging in the banking system and began downgrading the ratings of banks with significant exposures to such risks as early as the second quarter of 2022.' See Y Gopalan and J Granja, 'How (In)Effective was Bank Supervision During the 2022 Monetary Tightening?' University of

securities it ought to improve efficiency in lending markets since doing so means banks are forced to hold suboptimal levels of safe assets and forego more socially valuable lending.

II. Safeguards

Although insuring all deposits in the banking system would result in some significant benefits to macroeconomic stability, there would undoubtedly be some costs to this system. First, as I have noted throughout, moral hazard *does* exist in insurance schemes; it just does not function in the banking system in the way that is presented in much of the literature on deposit insurance. Because the diagnosis is flawed, the policy prescriptions which flow from that diagnosis are also ineffective, because actors do not behave in the way expected by the models concerned. In the case of large banks, depositors in excess of the insurance limit – like their insured counterparts – hold a put option on the public finances by virtue of these arrangements, because the insurance limit lacks credibility.

Thanks to the justified creditor belief in the safety of their claims, they lack sufficient incentives to exert discipline on their counterparties. In turn, this may lead to excessive risk-taking by some institutions, particularly as, given implicit blanket insurance, some institutions will attempt to free-ride on the collective insulation against losses enjoyed by large banks.

For these reasons, any introduction of blanket insurance would have to complemented by a number of safeguards, some of which already exist in one form or another. The most significant in this context are:

1. Require banks to pay for deposit insurance via risk-based premia

To counter the potential elevated levels of moral hazard induced by the introduction of blanket deposit guarantees, banks ought to be required to contribute to a pre-positioned deposit insurance fund, in proportion to their size and the risks they pose to the financial system.

At present, deposit insurance funds are in general not adequately funded, requiring recourse to public funds if and when banks become distressed. A recent study reveals, for example, that typical fund sizes equate to moderate percentage of total deposits depending upon the jurisdiction concerned: from 0.16 percent in Italy and Ireland up to 6.20 percent in Brazil. In the US, the deposit insurance coverage as of 2014 was negative.⁹⁷ Virtually all deposit insurance schemes enjoy lines of credit with national treasuries so that they might be recapitalised in the event of large losses.

Clearly, such arrangements are suboptimal from the perspective of liability risk management in an environment where the majority of bank deposits are fully guaranteed. The question then becomes how to assess the banks concerned so that the risks they pose are internalised as far as possible. Whilst it may be unrealistic to expect banks to fully fund a deposit insurance fund – as noted above, bank deposits in the US alone constitute tens of

Chicago Becker Friedman Institute for Economics (29 September 2023) at: <https://bfi.uchicago.edu/working-paper/how-ineffective-was-bank-supervision-during-the-2022-monetary-tightening/> last visited 30 May 2024.

⁹⁷J Adema, C Hainz and C Rhode, 'Deposit Insurance: System Design and Implementation Across Countries' (2019) 1 ifo DICE Report 42-51.

trillions of dollars – the current institutional arrangements whereby few deposits remain uncovered by contributions from banks would be untenable.

Regulatory practices that employ risk-based pricing for deposit premiums can encourage individual banks to internalise some of the economic costs tied to the presence of insurance. Risk-based premia compel insured institutions to internalise the costs associated with their risk-taking behaviour by levying a charge corresponding to the riskiness of the assets they hold. In this way, the riskier the asset on banks' books, the more they must contribute to the insurance fund by way of premia; provided that premia are set at appropriate levels, any risk-shifting subsidy from banks to public funds will be curtailed. The concept of risk-based pricing was initially introduced in the United States during the early 1990s and has since been adopted by numerous countries. In 1997, only Finland, Peru, Sweden, and the United States utilised risk-based premiums; as of 2013, this approach was embraced by 35 countries.⁹⁸

Determining the appropriate premia for banks is a challenging endeavour. Typically, banks' assessment ratings, capital adequacy, liquidity, and asset quality are considered in the calculation of such premia. Yet, some of these metrics can be subjective and oversimplified, often better at explaining past and current risks than forecasting future risks. This can lead banks to embrace new risks once premia are established to game the system. Furthermore, it may take regulators some time to fully comprehend and price in the costs associated with new and unfamiliar risks. Premia are also computed based on individual bank risk, but the expenses associated with insuring deposits and managing bank failures significantly increase when multiple failures occur concurrently.⁹⁹

Nevertheless, empirical evidence indicates that risk-adjusted premiums are more effective than flat-rate premiums in restraining excessive risk-taking by banks.¹⁰⁰ Such evidence implies that risk-adjusted pricing may curb moral hazard in countries with strong institutional environment and banks with the capacity to diversify risk.¹⁰¹ Even where banks attempt to arbitrage premia to counteract any negative impact of elevated premiums, recent research from the FDIC finds that the residual effect of risk-based premia on profitability remains significant.¹⁰² The study highlights that the decrease in profitability experienced by banks subject to higher premia far surpasses any potential benefits derived from heightened risk-taking. Furthermore, the study indicates that banks subject to greater pricing pressures to diminish risk-taking behaviours indeed respond by subsequently reducing their risk exposure. Similarly, banks categorised as low-risk and subjected to stronger incentives to maintain that status are less inclined to increase their risk levels in the future.¹⁰³

⁹⁸Demirgüç-Kunt and others (n 42).

⁹⁹V Acharya, JAC Santos and T Yorulmazer, 'Systemic Risk and Deposit Insurance Premiums' (August 2010) FRBNY Economic Policy Review.

¹⁰⁰Demirgüç-Kunt and Detragiache (n 38); Hovakimian, Kane and Laeven (n 40).

¹⁰¹See L Laeven, 'Pricing of Deposit Insurance' (July 2022) World Bank Policy Research Paper No. 2781, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=636235.

¹⁰²G Shoukry, 'Insurance Pricing, Distortions, and Moral Hazard: Quasi-Experimental Evidence from Deposit Insurance' (2020) 8 FDIC CFR WP.

¹⁰³These findings are supported by a number of other studies; for example, see L Chernykh and V Kotomin, 'Risk-based deposit insurance, deposit rates and bank failures: Evidence from Russia' (2022) 138 *Journal of Banking & Finance* 106483 (finding that 'risk-based deposit insurance schemes discouraging high insured deposit rates may help reduce bank moral hazard and improve financial stability'); MC Keeley, 'Deposit Insurance, Risk, and Market Power in Banking' (1990) 80 *The American Economic Review* 1183, (finding that '[fixed rate deposit premia] must be reformed to reduce the rewards it provides for excessive risk taking'); I Shim, 'Dynamic Prudential Regulation: Is Prompt Corrective

2. Activity restrictions

Activity restrictions operate in tandem with other macroprudential measures – such as capital and liquidity rules – to serve a number of purposes. To promote this goal, administrations in some jurisdictions have undertaken reforms to separate some of the public utility aspects of large commercial banking from other areas of finance which are regarded as less important from public policy perspectives. Functionally separating bank businesses serves three discrete purposes: to ensure a bank may operate on a standalone basis; to preserve a bank's business and assets in the event of distress in financial markets; and to limit insured banks' risky activities and investments.

In the UK, large commercial banks have been partially separated from their trading arms since legislation was introduced in 2013 compelling them to erect a 'ring-fence' around certain high-risk activities.¹⁰⁴ In this way, deposit funding may not be used by large UK banks to support secondary market trading. In the US reforms under the so-called Volcker Rule¹⁰⁵ have focused on prohibiting proprietary trading by commercial banks where deposits were used previously to fund trading for banks' own purposes. The rules are relaxed for smaller institutions which may invest up to 5% of their assets in proprietary trading if the bank controls less than \$10 billion in assets.¹⁰⁶ Banks are also prohibited from investing in 'covered funds' ie. hedge funds and private equity funds, although there are exceptions for some activities such as funding venture capital.¹⁰⁷

Given one of the overt aims of these measures in the UK and US is to prevent depositor funds from being used to fund speculative activities, the question of whether such restrictions ought to be extended in the case of blanket deposit insurance, is contestable. It is not possible to conclusively answer the question of whether strict separation of banking activities – such as a return to the Glass-Steagall position established in the US in 1933 – would be desirable in preventing any potential free-riding on public guarantees.¹⁰⁸ Whilst this might not remove all moral hazard from the banking system, it prevents institutions from using insured funds to assume risks from speculative activities which arguably should not be underwritten by public guarantees. There is, moreover, substantial evidence that the separation of commercial and investment banking activities can help mitigate systemic risk. By preventing banks from engaging in high-risk speculative activities with depositor funds, the likelihood of financial crises which require recourse to public

Action Optimal?' (2011) 43 *Journal of Money, Credit and Banking* 1625 (finding that financial stability optimally requires the combination of 'a risk-based deposit insurance premium and a book-value capital regulation'); GF Shoukry 'Insurance Pricing, Distortions, and Moral Hazard: Quasi-Experimental Evidence from Deposit Insurance' (2024) 59 *Journal of Financial and Quantitative Analysis* 896 (finding that insurance premia 'provided strong incentives to curb moral hazard ... firms that faced stronger pricing incentives to become (or remain) safer were more likely to subsequently do so than similar firms that faced weaker pricing incentives'); see also EJ Kane, 'Appearance and reality in deposit insurance: The case for reform' (1986) 10 *Journal of Banking & Finance* 175.

¹⁰⁴Financial Services (Banking Reform) Act (2013) Ch. 33.

¹⁰⁵The 'Volcker rule' prohibits commercial banks from conducting proprietary trading, and limits their ownership of and relationship with hedge funds and private equity funds. See Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111/203 (21 July 2010) Pub. L. No. 124 Stat. 1376.s.619.

¹⁰⁶See Economic Growth, Regulatory Relief, and Consumer Protection Act 2018 Pub. L. No. 115-174, codified in relevant part primarily at 15 U.S.C. 1650, 1681c, 1681c-1, 1681i and 42 U.S.C. 405b.

¹⁰⁷Covington & Burling LLP, 'The Volcker Rule 'Covered Funds' Rule: Eight Things To Know' (2020), available at: <https://www.cov.com/-/media/files/corporate/publications/2020/06/the-volcker-rule-covered-funds-rule-eight-things-to-know.pdf>.

¹⁰⁸L Menand and M Ricks, 'Rebuilding Banking Law: Banks as Public Utilities' (12 September 2023) *Yale Journal on Regulation*, Forthcoming, European Corporate Governance Institute - Law Working Paper No. 732/2023, available at SSRN: <https://ssrn.com/abstract=4568656>.

funds is reduced. Studies have found that countries with stricter separation between banking activities experienced lower systemic risk and fewer bank failures.¹⁰⁹

F. Conclusion

This article has shown that there are multiple limitations to claims made concerning moral hazard in the literature on bank deposit insurance. Uninsured creditors – even highly sophisticated lenders – frequently do not act in ways predicted by models of insurance. Rather than actively monitor their counterparties, they do not provide the market discipline one ought to expect. By analysing two recent bank runs in the UK and US, the article demonstrates that such inertia is not merely theoretical. The article has also highlighted a number of drivers of such dynamics. These dynamics result in a suboptimal blend of implicit government guarantees underwriting the entire financial system. One option to address the distortions arising from these circumstances is to formalise these arrangements through the introduction of unlimited deposit insurance for commercial banks. Whilst controversial, this reform would have the potential to produce a number of additional benefits; most notably, an end to bank runs and a compression of the shadow banking system.

Disclosure statement

No potential conflict of interest was reported by the author(s).

ORCID

Jay Cullen  <http://orcid.org/0000-0003-3149-3816>

¹⁰⁹A Demirgüç-Kunt and H Huizinga, 'Determinants of Commercial Bank Interest Margins and Profitability: Some International Evidence' (1999) 13 *The World Bank Economic Review* 379-408; AE Wilmarth, *Taming the Mega-Banks: Why We Need a New Glass-Steagall Act* (Oxford University Press 2020); JC Crawford, 'A Better Way to Revive Glass-Steagall' (2017) 70 *Stanford Law Review* 1.