

# BANK FAILURES AND CONTAGION

## **LENDER OF LAST RESORT, LIQUIDITY, AND RISK MANAGEMENT**



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# BANK FAILURES AND CONTAGION **LENDER OF LAST RESORT, LIQUIDITY, AND RISK MANAGEMENT**

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# TABLE OF CONTENTS

|   |             |
|---|-------------|
| <b>Foreword</b> .....   | <b>vii</b>  |
| <b>Acknowledgments</b> .....  | <b>viii</b> |
| <b>Abbreviations</b> .....  | <b>ix</b>   |
| <b>Executive Summary</b> .....  | <b>xi</b>   |
| <b>I. Introduction</b> .....  | <b>1</b>    |
| <b>II. What went wrong?</b> .....   | <b>4</b>    |
| <b>III. Vulnerabilities that were exposed and what to do about them</b> .....       | <b>7</b>    |
| <b>IV. Important interactions between reforms and overall recommendations</b> ..... | <b>28</b>   |
| <b>V. Concluding observations on actions needed</b> .....                           | <b>31</b>   |
| <b>References</b> .....   | <b>32</b>   |
| <b>Group of Thirty Members 2024</b> .....   | <b>35</b>   |
| <b>Group of Thirty Publications since 2015</b> .....                                | <b>40</b>   |

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TABLE

Table 1. Runnable liabilities as a share of cash and potential collateral sources ..... 11





# FOREWORD

**W**e are pleased to release *Bank Failures and Contagion: Lender of Last Resort, Liquidity, and Risk Management*, which continues the series of Group of Thirty reports addressing complex financial sector and banking regulatory weaknesses.

The study examines the gaps revealed by the 2023 failures of Silicon Valley Bank, Signature Bank, First Republic Bank, and Credit Suisse and offers potential solutions to strengthen existing regulatory architectures. Importantly, it proposes greater pre-positioning of collateral at the central bank to address bank liquidity needs in times of stress.

The bank failures of 2023 also demonstrate that supervisory vigilance must be maintained, and that effective

risk management, by the board, C-suite, and supervisors, is and always will be an essential corollary to lender-of-last resort and liquidity provision.

On behalf of the Group of Thirty, we thank Project Chair, William Dudley, for his dedicated leadership of the Working Group on the 2023 Banking Crisis, and Project Director, Stijn Claessens, for significant contribution in drafting the text. We also thank Project Advisors Darrell Duffie and Patricia Mosser for their active engagement in the project. Finally, we thank the G30 members who served as participants in the Working Group for their time and their contributions to the project.



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*Chairman, Board of Trustees*

*Group of Thirty*



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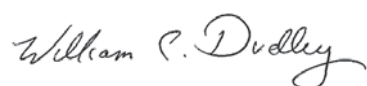
On behalf of the Group of Thirty (G30), I would like to express great appreciation to those whose time, talent, and energy have driven this project to successful completion. I thank the members of the Working Group on the 2023 Banking Crisis, who supported the project and helped craft the report's findings. The intellect and experience of the group was a vital part of the discussions and subsequent recommendations within the report.

The Working Group also thanks the leaders in the financial and regulatory community who agreed to be interviewed by our leadership team, informing considerations in the final report.

The G30 extends our deep appreciation to the Project Director, Stijn Claessens, for his steadfast support and

careful draft of the report, and to the Project Advisors, Darrell Duffie and Patricia Mosser, for their careful counsel during the project and contributions to the analysis within the report.

The coordination of this project and many aspects of project management, Working Group logistics, and report production were centered at the G30 offices in Washington, D.C. This project could not have been completed without the efforts of our editor, Diane Stamm, and the work of Executive Director, Stuart Mackintosh, and his team, including Desiree Maruca and Maria Cueto Velez. We are grateful to them all.



**William C. Dudley**

*Chair*

*G30 Working Group on the 2023 Banking Crisis*

# ABBREVIATIONS

|              |  |               |  |
|--------------|--|---------------|--|
| <b>AFS</b>   | available for sale                           | <b>FRC</b>    | First Republic Bank                    |
| <b>AOCI</b>  | accumulated other comprehensive income       | <b>G-SIB</b>  | globally systematically important bank |
| <b>AT1</b>   | Additional Tier 1                            | <b>G30</b>    | Group of Thirty                        |
| <b>CLF</b>   | committed liquidity facility                 | <b>HQLA</b>   | high-quality liquid assets             |
| <b>CRO</b>   | Chief Risk Officer                           | <b>HTM</b>    | hold to maturity                       |
| <b>CS</b>    | Credit Suisse                                | <b>IRR-BB</b> | Interest Rate Risk in the Banking Book |
| <b>EU</b>    | European Union                               | <b>LCR</b>    | liquidity coverage ratio               |
| <b>EVE</b>   | economic value of equity                     | <b>LoLR</b>   | lender of last resort                  |
| <b>FDIC</b>  | Federal Deposit Insurance Corporation        | <b>MTM</b>    | mark to market                         |
| <b>Fed</b>   | Federal Reserve                              | <b>NSFR</b>   | net stable funding ratio               |
| <b>FHLB</b>  | Federal Home Loan Bank                       | <b>PFAS</b>   | pawnbroker for all seasons             |
| <b>FINMA</b> | Swiss Financial Market Supervisory Authority | <b>SBNY</b>   | Signature Bank of New York             |
|              |  | <b>SVB</b>    | Silicon Valley Bank                    |



# EXECUTIVE SUMMARY

Events in March 2023 shook up the banking systems in the United States and Europe and have led to reflection in many jurisdictions and globally on the appropriate regulatory and supervisory responses. This report takes a high-level view of the causes of the turmoil and develops a set of desirable reforms and the appropriate balance among them.

Like other diagnoses, the report attributes the individual failures in the United States to a combination of banks' poor business models and weak risk management, and a rapidly shifting macroeconomic environment. The combination led to risky funding structures, large unrealized losses, and declining profit margins at several US banks, with large deposit runs then leading to their failures. Management deficiencies at Credit Suisse, a globally systemic bank, caused its profitability to deteriorate and equity and credit market valuations to progressively decline, causing it to be cut off as a counterparty for many transactions and the necessity of a merger. The broader fallouts of these failures led to large-scale public interventions in both countries, with the objectives of halting contagion and restoring confidence.

These failures and interventions revealed many weaknesses in banks and institutional frameworks: supervisory failures, mis-calibrated regulatory requirements, weaknesses of accounting rules, and deficient lender-of-last-resort (LoLR) facilities and resolution frameworks. Most of these causes have already been identified and noted in recent reports and official statements. Analyses

to date have, however, often taken a narrow perspective, ignoring, for example, the important contributing role of easy monetary policy and the channels by which (individual) failures can threaten financial stability. Analyses also often assess reforms piecemeal, rather than holistically, and do not always consider ongoing longer-term developments and structural changes.

A major issue common to all banking systems is that runs will be much faster compared to earlier periods, given the greater ease of withdrawals with more online real-time banking. Contagion will be larger, given the faster spread of information through social media. Finally, analyses place too little emphasis on the inadequacy of current LoLR regimes to limit contagion ex ante in a world of nearly instantaneous runs.

To address these issues in a broad and forward-looking way for many jurisdictions, the report develops two sets of reforms.

First, we discuss reforms that can limit contagion when (inevitably) bank failures occur and, by doing so, reduce the related adverse financial stability and broader economic consequences. This set of reforms includes enhanced liquidity support mechanisms, notably a much-improved LoLR regime, possible changes to deposit insurance, and a truly workable scheme for resolving large banks. For these reforms, the primary goal is to reduce the risks of liquidity and other stresses from spilling over to other banks and the system at large. This would allow more time for orderly interventions, including resolution, and thereby help to

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avoid the use of extraordinary public-sector interventions that, unfortunately, have all too often been necessary. Furthermore, by clarifying ex-ante arrangements, the risk of runs and liquidity stresses can be reduced in the first place. Importantly, by design, such changes would encourage banks to choose less risky funding structures and thereby reduce vulnerabilities and the risk of runs.

Second, we discuss reforms designed to reduce the likelihood of banks failing. These reforms include better bank governance, improved accounting standards and financial reporting; changes to prudential regulations; and much better supervision, including more comprehensive stress tests. Most of these reforms, many advocated for some time, do not impose large costs, if any, on those banks that are already well run and transparent, and they will both force and incentivize banks that are poorly run to improve their performance. Most importantly, by reducing the risks of ex-ante stress and contagion, these reforms should foster greater financial stability and more efficient financial services provision, thereby reducing the costs associated with financial stress.

Key among the first set of reforms is a better LoLR system. This is a crucial and feasible reform. The reformed LoLR changes proposed here would entail banks pre-positioning enough collateral to cover, after the normal haircutting for credit risks, all runnable liabilities—that is, all liabilities excluding capital, long-term debt, swap liabilities, and insured deposits. Central banks would support this with an efficient collateral management system. Such an LoLR system would enable banks to obtain immediate liquidity in times of stress so that they can avoid fire-selling assets. By providing a reliable and viable backstop source of liquidity, a reformed LoLR reduces the risk that uninsured depositors and other short-term claimholders would run during periods of banking stress. Liquidity management in normal times would remain with banks. An improved LoLR should have little impact on the operations of banks (for example, small banks) with mostly insured deposits, because the amount of collateral that would need to be pre-positioned would be a small share of their total assets. An improved LoLR would incentivize other banks to fund themselves more prudently.

A better LoLR for times of stress is preferable to alternatives such as sharply increasing liquidity requirements, which would impose even larger deadweight losses by requiring banks to hold more assets defined as highly liquid, but which may not be a genuine source of liquidity in times of (systemic) stress. And a better LoLR system is preferable to significantly raising deposit insurance limits, which further increases moral hazard, and sharply increasing capital requirements, which could make banks less competitive and drive more activity into the (less-regulated) nonbank system. Although there would be some initial costs at central banks and commercial banks to implement this new regime, the operating costs of improving the LoLR will be low relative to its benefits. Improving the LoLR would likely involve no direct government cost for credit losses. Haircuts on pledged collateral, when calibrated for tail-event credit risks, have historically resulted in no losses for central banks.

The report stresses, however, that an enhanced LoLR should not be seen as a first resort. In normal times, banks need to conduct their own prudent asset-liability management, including by holding enough liquid assets, and use the interbank market for liquidity imbalances, except in the most extreme scenarios that cause a need for an LoLR. An enhanced LoLR system is not a “get out of jail free card” for those banks with poor risk management. In fact, the opposite is true, since the proposed LoLR changes penalize banks with risky funding structures by making them pre-position more collateral. In addition, our report emphasizes the need for complementary reforms for weak banks in the form of tougher prudential and accounting rules and enhanced market and supervisory discipline.

These recommendations are guided by several principles, a key one of which is to focus on a prioritized package of reforms. While many reforms are appropriate, some are more important than others. Some reforms also present a better trade-off between reducing the probability of failure and systemic risks compared to imposing higher costs or making banks less competitive and forcing activity outside the regulated banking perimeter. Another guidepost is to favor those reforms that are already within the remit of the supervisory agencies or other authorities. Another principle is that reforms should balance government support

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with market discipline. Self-insurance against losses and runs and limited expectations of public sector support should be the norm. Not every bank that encounters stress should be saved, especially if it is insolvent. An effective regime of intervention in and resolution of (systemic) banks, supported by a well-functioning LoLR system and an effective deposit insurance scheme, should make authorities less concerned about the risk of contagion.

That said, in a truly systemic crisis, the public sector will have to deploy extraordinary interventions. Properly balanced, these recommendations will foster both profitable and stable individual banks and banking systems that facilitate efficient financial intermediation, with less incidence of individual bank failures leading to broader systemic consequences.





# I. INTRODUCTION

Events in March 2023 shook up banking systems in the United States and Europe and have led to widespread reflection in many jurisdictions and globally on the appropriate regulatory and supervisory responses. This report takes a high-level view of the causes of the turmoil and develops a set of desirable reforms and the appropriate balance among them.

***We propose two sets of reforms: those to limit contagion and those to reduce the risk of banks failing.***

The report distinguishes two sets of reforms. First are measures designed to limit contagion when bank failures inevitably occur, and the impact on financial stability and the broader economy. This set includes enhanced liquidity support mechanisms, notably a much-improved lender-of-last-resort (LoLR) system. It also considers possible changes to deposit insurance and a truly workable scheme for resolving large banks. For these reforms, the primary goal is to reduce the risks of liquidity and other stresses spilling over to other banks and the financial system at large.

An improved LoLR system should allow more time for orderly interventions, including resolution, which is important given the increase in the speed and scope of runs in an instant payment, digitalized financial system. A well-designed LoLR system should not be costly in that it strengthens ex-ante arrangements that reduce the risk of runs and liquidity stresses, and thus crucially, helps

avoid the use of extraordinary public sector measures that, unfortunately, have all too often been necessary.

The second set are reforms that reduce the likelihood of banks failing. This includes better bank governance, both internal and external, improved accounting standards, and enhanced financial reporting, changes to prudential regulations and, crucially, much better supervision. Many of these reforms have been advocated for some time. They do not impose large costs, if any, on banks that are already well run. And for banks that are not well run, it should incentivize them to shape up. Most importantly, by reducing contagion risks ex ante, as opposed to responding ex post and in great force, they avoid unnecessary costs for society.

***The report's three guiding principles are: the need for a holistic perspective, a balance between market discipline and public support, and consideration of the impact of reforms on the overall financial system.***

The first guiding principle is to consider all possible reforms together and to recognize that the final response will have to be a judicious mix. Some reforms are more important than others, and there are crucial complementarities and substitutions among reforms, making some even more pivotal. In addition, some reforms score better than others on the tradeoffs between reducing the probability of failure and systemic risks versus making banks less competitive and forcing activity outside the regulated

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banking perimeter. Finally, some reforms are less costly to banks and do not require legislative changes as they already fall within the remit of the supervisory agencies or other authorities.

The second guiding principle is that reforms should allow for an orderly intervention in or resolution of distressed banks (including possibly systemic ones) without worries about this risking widespread contagion. This calls for incentives to encourage proper operations and risk management by banks and other financial institutions and complementary government actions, with the latter varying between normal and stress times. The overall goal must be to encourage self-insurance by banks in normal times, with limited reliance on public sector support, including against runs. In times of stress, it calls for a better balance between market discipline and government support. Not every bank that encounters stress should be saved, especially if it is insolvent, because that undermines market discipline and increases moral hazard. That said, in a systemic crisis, the public sector will have to deploy many extraordinary interventions.<sup>1</sup>

The final guiding principle is that the reforms should result in a system with limited and contained vulnerabilities, but also competitive banks and efficiently provided financial services. For this, reforms need to consider banks' operating environment and viability given not just recent events, but also ongoing longer-term developments and structural changes. Reforms should foster not only the stability and efficiency of individual banks and banking systems, but also of the financial system, more generally. Making banks safer by adding requirements only on banks forces more activity into the less regulated nonbank sector. New policy measures and reforms need to consider which part of the financial system (banks, nonbanks, capital markets) is best suited to provide the specific service the economy and society need, because reforms may encourage migration across the parts, with varying costs and benefits. These three guiding principles apply in varying ways to all jurisdictions.

***A better LoLR system is the most important, most feasible, and lowest-cost reform.***

These principles lead to the proposal for a better LoLR system, as both the most important but also the most feasible and lowest-cost reform. It entails banks prepositioning enough collateral after haircuts for tail-event credit risks, to cover all runnable liabilities—that is all liabilities excluding capital, medium-to-long-term debt, swap liabilities, and insured deposits. And it needs to be supported by an efficient collateral management system. A well-functioning LoLR system can provide banks liquidity in times of stress so that they can avoid a fire sale of assets. And, by being viewed as a reliable and viable source of liquidity, an effective LoLR system reduces the risk that uninsured depositors run. Because LoLR would be used only in periods of financial stress, liquidity management in normal times would remain with banks. Our proposed LoLR upgrade would have little impact on banks with large insured deposits, and incentivizes other banks to fund themselves more prudently. It would address the major issue today, common to all jurisdictions, that runs are much faster, given greater ease of withdrawals, with more online real-time banking and contagion larger, given the ability of information (and disinformation) to spread rapidly through social media.

Improving the LoLR system is preferable to alternatives such as recalibrating (sharply increasing) liquidity requirements, which would impose larger deadweight losses on banks by forcing them to hold on their balance sheets more assets classified as highly liquid, but which may not be a genuine source of liquidity in times of (systemic) stress. It is also preferable to significantly raising deposit insurance limits, which further raises moral hazard; or to sharply increasing capital adequacy requirements, which makes banks less competitive and drives more activity into the (less regulated) nonbank sector. Improved LoLR does not involve an increased risk for the public sector as haircuts that adjust for tail-event types of credit risks have historically not resulted in losses for central banks.

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<sup>1</sup> In this context, the report does not attempt to revisit decisions made in March 2023 or just before. For many policy actions, especially in late March, there were no good alternatives. One can question some other decisions, but even for those, alternatives were limited and had their own costs. Rather, the report develops reforms that prevent situations like those of March 2023 from happening again at the most reasonable cost-benefit tradeoff.

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The report stresses that an enhanced LoLR should not be a first resort for liquidity. In normal times, banks need to manage their liquidity on their own, hold enough liquid assets, and use the interbank market for liquidity imbalances. Nor is it a free “get out of jail card” for those banks with poor risk management; rather, it is the opposite, since by design it penalizes banks with risky funding structures (by making them pre-position more collateral). In addition, such banks should face enhanced market and supervisory discipline, and tougher prudential and accounting rules. The report therefore emphasizes the need for these and other complementary reforms. Some of these have proven difficult to get enacted, but perhaps only because they impose costs on selected groups of banks, not because they are hard or costly for the whole banking system.

The rest of this report proceeds as follows. Section II briefly reviews what went wrong in the banking sector that led to the March 2023 banking crisis. Section III discusses the vulnerabilities that were exposed and what to do about them, proposes measures to deal with banking system stress, and discusses how to prevent and reduce bank failures and liquidity stresses, through measures that help limit contagion and its consequences to broader financial stability, including a much-improved LoLR function. Section IV reviews the interactions between reforms that reduce the risks of banks failing and the overall recommendations. Section V concludes with observations and evaluates areas that need further analysis.

## II. WHAT WENT WRONG?

Much has already been written about the March 2023 banking-related events in the United States and Europe and what led up to them. Reports<sup>2</sup> generally agree on most of the immediate factors and underlying causes.

*Poor bank management and rapid tightening of monetary policy were the two main causes of the bank failures, with various institutional weaknesses as common underlying causes.*

Two main factors are common to all analyses: banks' fragile business models and weak risk management, and a rapidly shifting macroeconomic environment with sharp increases in short-term and long-term interest rates. Many of the underlying causes mentioned are not new and include significant supervisory failures, with agencies playing catch-up to developments on the ground, mis-calibrated regulatory requirements, weaknesses in accounting rules, deficient lender-of-last-resort (LoLR) regimes, and poor resolution frameworks. All of these have featured in earlier crises.

The analyses have also stressed how the speed of the run was lightning fast due to the greater ease of withdrawals and the more rapid spread of information. At the same time, much of the analysis has ignored broader issues such as the role of quantitative easing in flooding banking systems with liquidity as an important contributing factor and not

emphasizing the distinction between financial stability and individual bank failures. Reports have also underemphasized the inadequacy of the LoLR regime, notably but not only in the United States, and how it failed to limit contagion on an ex-ante basis.

*Although there are important differences between the US cases and that of Credit Suisse, many of the causes and lessons apply broadly to many jurisdictions.*

*US banks failed due to their poor risk management and the rapid rise in interest rates.*

The failure of the three US banks—Silicon Valley Bank (SVB), Signature Bank of New York (SBNY), and First Republic Bank (FRC)—are generally seen to be caused by a combination of bank-specific factors, supervisory failures, and a rapid increase in short- and long-term interest rates in response to the inflation spike after a prolonged period of policy rates at the effective lower bound, large quantitative easing, and low bond yields.<sup>3</sup>

The bank-specific factors included the vulnerabilities created by overreliance on large, highly concentrated uninsured deposits to fund long-term fixed income assets. All three banks had distinct, specialized, and narrow business models, and most had weak governance. But for all

<sup>2</sup> See, for example, Barr (2023), BCBS (2023), FDIC (2023), FSB (2023), NYU Stern (2023), official testimony, and ongoing investigations.

<sup>3</sup> Silvergate Bank's self-liquidation in March 2023, in part due to its interconnections with the crypto-asset ecosystem, added to the financial turmoil, but did not constitute a failure.

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three, it was the large asset-liability mismatches that led to their demise. When interest rates rose, their long-dated investments lost value through valuation losses on securities held and the banks faced the prospect of significantly lower net interest margins. These developments caused investors to reassess these banks' business models, downgrade their earnings expectations, and question the banks' capital adequacy and viability.

Vulnerabilities did vary among the banks. SVB invested mostly in government securities and its management of interest rate risk was very weak. SBNY catered to the cryptocurrency and decentralized finance ecosystems, exposing it to reversals in those businesses. FRC's business was more traditional, but it had a narrow asset portfolio and customer base (mainly nonconforming, fixed-rate mortgages for high-income individuals). In all three cases, their uninsured deposits turned out to be much less sticky than anticipated, making the banks vulnerable to rapid deposit runs and repricing of liabilities. In the case of SVB, the depositors were closely linked to each other through social media and other networks, causing a massive run in a few days. In the case of SBNY, some of its large deposits were from cryptocurrency firms that pulled them out in the face of the crypto winter and the general turmoil. In the case of FRC, while its assets were predominantly safe mortgages, they were extended at low and fixed-interest rates, and when its funding costs rose as deposits fled, its asset-liability mix impaired future profitability.

***Credit Suisse's failure reflected a long series of management mistakes.***

The failure of Credit Suisse (CS) was long in the works, in that it was the cumulation of poor risk management, serial mishaps, and a gradual erosion of its core franchise. Between 2014 and late 2022, CS stock fell from 30 Swiss francs to 4 Swiss francs, or 85 percent, in large part as its revenues grew slowly while its operational costs remained high. It also faced a series of large losses (for example, Archegos Capital Management and Greensill Capital) and high ongoing legal costs. Shareholders and regulators failed in having the bank make the fundamental changes needed. In addition, analysts lost confidence in the bank's future earnings prospects. Despite a series of

restructurings, the bank made little progress in reducing costs and enhancing its profitability (with large operational losses during 2020–22).

A loss of confidence, triggered by an unsubstantiated rumor that CS was failing following the unveiling of a strategic review, started in October 2022 and led to wealth management and other clients withdrawing large amounts of funds. The loss accelerated with the financial turmoil in the United States in March 2023. Just before its demise, the bank's five-year credit default swap rates spiked to over 1,000 basis points. In its last week, the bank saw runs across many types of liabilities, needed very large amounts of official liquidity support, and was cut off as a counterparty for many types of transactions (for example, it could no longer operate in foreign exchange markets or be accepted as a derivatives counterparty).

***The rapidly shifting macroeconomic environment was a common key factor in banking stress.***

Until mid-2021, the general macroeconomic environment was conducive to the buildup of banking vulnerabilities in both the United States and Europe. The long period of very low interest rates following the global financial crisis induced aggressive asset-liability management by banks. The prospects of low interest rates for longer, endorsed several times by central banks' forward guidance, encouraged concentrated investments in long-dated, fixed-income securities. At the same time, the low interest rates and the policy of quantitative easing in the United States and other jurisdictions and foreign exchange interventions in Switzerland flooded the banking systems with large amounts of reserves and increased the amount of bank deposits, mostly uninsured. For many years, this asset-liability mix worked very well and was very profitable. As depositors also had limited alternatives, this strategy was supported by stable deposit franchise values.

This all shifted rapidly in 2021 and 2022 when inflation rose sharply, driven by expansionary policies during COVID and later the war in Ukraine. After first calling the inflation spike "transitory," in 2022 advanced economies' central banks embarked on aggressive paths of raising rates and signaled moves toward quantitative tightening. These shifts led to a repricing of a wide range of securities and some

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types of loans and other assets. Deposits did not reprice as much: interest rates on retail and to a lesser degree wholesale deposits moved up much more slowly than the rise in policy rates in both the United States and Europe. With limited migration of deposits to nonbanks, at least until the March 2023 events, there were consequently limited funding or profitability worries for most banks.

***As the risks of contagion and overall financial stability increased, larger interventions followed.***

Common to both cases was the rapid outflow of deposits and other funding, a phenomenon that is likely here to stay.<sup>4</sup> As is often the case, however, the specific triggers for the stresses and subsequent failures varied. SVB's failed attempts to raise new capital following the disclosure of large mark-to market losses on US Treasury securities holdings, and a CS major shareholder refusing to invest more capital, caused investors and depositors to reassess the prospects of both banks. This resulted in very large deposit runs at SVB and accelerated the run already underway at CS. For SVB, as its run accelerated to some \$40 billion per day, the supervisory agency in charge closed it on Friday, March 10, and appointed the Federal Deposit Insurance Corporation (FDIC) as its receiver. On that same day, SBNY suffered \$10 billion in deposit outflows, while withdrawals from FRC reached \$25 billion. As the failures quickly evolved into a panic, large public interventions followed on Sunday, March 12. For CS, the run, including on its asset management accounts, was felt with full force during the week of March 13th, and the Swiss National Bank had to provide large amounts of emergency liquidity support. With the bank cut off by its financial counterparts by Friday, Swiss authorities took steps over the subsequent weekend to facilitate the acquisition of CS by UBS.

The main systemic issue in the United States was contagion. Collectively the banks that failed in 2023 had assets greater than the amount lost in 2008. The large interventions were undertaken in order to prevent subsequent widespread deposit runs on other banks. The

run at SVB and the overall turmoil had already made investors reassess SBNY and FRC. As weak spots were found there too, large amounts were withdrawn from those banks. This necessitated the systemic risk exceptions that allowed for all deposits of SVB and SBNY to be guaranteed. Since the exception can only be evoked on a case-by-case basis and only after stress manifests itself, its future use remained unclear; hence, incentives for runs at other banks persisted.

Runs did start (or threatened to) at other, similar banks (for example, Comerica, First Foundation, KeyCorp, PacWest, Truist, and Western Alliance) as depositors and other creditors also began to doubt the viability of those banks' business models. As bank call reports confirmed, many also relied on uninsured deposits, seen as likely to reprice or run, threatening a sharp increase in funding costs. Some banks also had large (unrealized) losses on their securities or other fixed-income assets. As more people became aware of the vulnerabilities (including through social media) and the scope and strength of the government safety net remained uncertain, large amounts of uninsured deposits were at the point of running. The interventions at SVB and SBNY to protect all depositors, and the Bank Term Funding Program (BTFP) designed to provide long-term funding against Treasury and agency mortgage-backed securities, helped stabilize the banking system. Deposit outflows slowed and eventually halted.

In the CS case, in addition to the systemic size of the bank and the related risks to overall banking system stability, concerns about the country's reputation as a financial center motivated the large-scale support, from both the Swiss National Bank and the Swiss government, to facilitate the takeover. Apprehensions about putting the bank into resolution motivated the choice of selling the bank to UBS. This came with the decision to fully write-down 16 billion Swiss francs of Additional Tier 1 (AT1)<sup>5</sup> claims. Along with a government asset guarantee and continued large access to the Swiss National Bank's regular and enhanced emergency lending facilities, this facilitated the takeover by UBS.

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<sup>4</sup> See, for example, Bindseil and Senner (2023).

<sup>5</sup> AT1 instruments were created in the wake of the 2008 Global Financial Crisis by the Basel Committee. Unique to the banking industry, AT1s serve as hybrid capital instruments which are meant to help recapitalize banks in the event of insolvency or non-viability, either through equity conversion or a full write-off

# III. VULNERABILITIES THAT WERE EXPOSED AND WHAT TO DO ABOUT THEM

The events that led up to the March 2023 banking crisis revealed weaknesses in various areas—weaknesses not unique to the countries with the greatest systemic fallout—and resulted in calls for many reforms. These reforms can be best ordered in two sets: those that aim to reduce the degree of contagion arising from cases of individual bank stress; and those that aim to prevent, or at least reduce, the risk of bank failures. Realizing that there is some overlap and many interactions among the reforms, we include under the first group better liquidity support mechanisms, including an improved lender-of-last-resort regime, and possible changes in deposit insurance as well as resolution. Under the second group, we include changes in the obligations of bank management and governance, accounting rules, supervision, and prudential regulations.

## III. 1. How to deal with banking system stress

The risk of contagion in the form of very large and speedy runs at other banks was high during the week of March 5, 2023, and was the main motivation for invoking the systemic exception the following weekend in the United States and a key factor behind the unprecedented interventions in Switzerland. The main reforms proposed in this section are aimed at reducing this risk by reducing the incentives for depositors and other creditors to run

from banks. If runs nevertheless occur, these reforms at least can allow time for orderly resolution. The reforms crucially involve a redesign of the lender-of-last-resort (LoLR) system—the discount window mechanism at the central bank, and improvements to its operation. While there are differences across jurisdictions as to specific constraints, the LoLR system is not fully effective in many and is not designed to cope with the increasingly faster runs of depositors and other claimholders. In addition, proposals made for reforming deposit insurance and their costs and benefits are evaluated, and the state of affairs on resolution is assessed.

### A. Lender of last resort

*The current LoLR system has deficiencies, notably but not only in the United States, where the stigma is severe.*

In principle, the three US banks that failed, as well as the other banks that experienced liquidity strains that did not turn out to be fatal, could have accessed the Federal Reserve liquidity facilities (the so-called Primary Credit Facility, otherwise known as the discount window, and the Secondary Credit Facility).<sup>6</sup> While liquidity support would not have addressed the three banks' underlying solvency issues, it could have provided some time to organize orderly resolutions. But for several reasons there was

<sup>6</sup> There is also so-called "seasonal credit" available to banks with deposits of less than \$500 million that can demonstrate liquidity needs of a seasonal nature.

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little use of these facilities in the weeks leading up to the bank failures. The three banks were not able to access the discount window on time and in sufficient scale in March, largely because they could not mobilize the eligible collateral rapidly enough. In great part, this inability was due to a lack of operational preparedness on the part of the banks, notably of SVB.<sup>7</sup> But more generally, few banks in the United States use the discount window,<sup>8</sup> and many are operationally not ready for its use.<sup>9</sup> The limited preparedness for, and actual use of, the LoLR increases the risks that make depositors more willing to run, because they are not assured of a viable source of liquidity, and a lack of liquidity can provoke a fire sale of assets.<sup>10</sup>

The limited preparedness for and use of the LoLR has been a long-standing issue in the United States and some other jurisdictions, for a variety of reasons. The main obstacle for the United States is the substantial stigma associated with using the discount window. For a long time, using the LoLR has been viewed as a sign of weakness. While rules were changed in 2002, in practice the attitude of supervisors, rating agencies, politicians, reserve banks, bank analysts, the press, and bank senior management has not changed. Supervisors and senior policymakers have at times given banks conflicting signals as to the value attributed to using the window. And members of Congress have at times condemned its use for various reasons. Banks have therefore invested little in operational preparedness. In addition, while

the pricing of the primary facility does not appear to be a major impediment, some design issues impede its use. Specifically, banks with a lower credit standing must use the secondary facility, which adds to the stigma for those banks. For banks with access to the primary facility, the question is why they are not obtaining their funding in the money and interbank markets. And, given the associated pricing difference (50 basis points), moving to the secondary facility becomes less useful to address liquidity issues when most needed, because it raises funding costs and, thus, aggravates concerns about viability.

There can be other obstacles to LoLR use. For the failed banks, as well as many other banks, holdings of unencumbered collateral had fallen due to increasing collateralized borrowings to offset lost deposits. In the United States, much of this borrowing was notably from the Federal Home Loan Banks (FHLBs), which is not unusual in times of stress.<sup>11</sup> FHLBs require collateral against their advances, making less collateral available for LoLR lending. Furthermore, in receivership, FHLB claims have a (statutory-based) super lien—that is, first priority—on all the borrower’s assets, which mostly disadvantages the FDIC, but to some degree also affects LoLR lending.<sup>12</sup> By being the de-facto lender of next-to-last resort, and by behaving procyclically more generally (including in terms of haircuts and spreads), the FHLB system impedes both proper risk management in some banks and the use of a central-bank-based LoLR.<sup>13</sup>

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7 For example, SVB did not test its capacity to borrow at the Federal Reserve discount window in 2022 and did not have appropriate collateral and operational arrangements in place to obtain liquidity. Noteworthy for SBNY is that during 2021–22, it intended to pledge capital call/subscriber loans to the Federal Reserve Bank of New York (FRBNY) as collateral for LoLR lending, but the FRBNY would not accept the loans as eligible collateral. Credit Suisse, as noted, extensively used the Swiss National Bank ordinary and special liquidity facilities in its last weeks.

8 Ennis and Klee 2023.

9 See, for example, Saphir 2023.

10 See McLaughlin 2023.

11 Cooperman et al. (2023) show that at the end of 2019, the largest 100 banks got on average 8 percent of their wholesale funding from FHLBs. In March 2020, globally systemic banks (G-SIBs) got all their needed new funding from new deposits, whereas regional banks got some 40 percent of their funding from FHLBs, at costs less than wholesale unsecured funding, but more than deposit funding.

12 While there is still the protection of collateral that can be liquidated, other resources of the failed institution are only available after the FHLB claims have been met, making LoLR lending somewhat riskier.

13 More generally, the FHLB system does not always play a productive role in cases of financial stress. By being liberal in its lending at times of stress (one indicator is that the total amount of FHLB advances doubled in the 12 months before March 31, 2023), it often just delays the resolution of banks that eventually fail. The FHLB-system is also not very transparent, and its governance is mixed. It is considered a government-sponsored enterprise, with the full backing of the US government, which gives it an AA- rating, a substantial upgrade from its self-standing rating (which may be BBB+), yet it is governed by the private sector. FHLBs also have several other advantages, including access to Federal Reserve deposit facilities, which allows them to intermediate funds to those that do not have access and earn a spread. Its own liabilities count as high-quality liquid assets, like those of other government-sponsored enterprises. Yet, FHLBs tend to have weak risk management; for example, they require limited prudential conditions to be met by banks before lending. These broader questions as to the role of the FHLBs in financial intermediation are not addressed here (See Federal Housing Finance Agency 2023).



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In other jurisdictions, the LoLR has generally had a better reputation. For many central banks, the discount window operates more as an upper limit on the pricing of central bank money (that is, as part of a corridor system). Nevertheless, considering the events, the increasing speed of runs, monetary policy tightening, and reserves becoming less plentiful, other central banks are reviewing their LoLR systems. For any banking system, a well-functioning LoLR system provides two benefits: first, it gives banks liquidity at those critical times so they can avoid a fire sale of assets and other losses of value; and second, by being viewed as a reliable source of cash from the perspective of uninsured depositors, it reduces the risk that depositors and other claimholders run.

***Global lessons suggest these key LoLR reforms: better lending terms, actions to reduce stigma, and more efficient collateral management.***

Improving the LoLR system in the United States requires reducing the stigma of using it and easing its actual use. One step would be adjusting its terms, that is, lowering the costs of the secondary credit facility and possibly lengthening the duration of loans.<sup>14</sup> A complementary and likely more important step is greater consistency in signals that the LoLR is available to be used by having supervisory and other policymakers encourage preparedness and use. While the Federal Reserve's formal stated policy rule is "no questions asked" (for the primary credit facility), in practice this appears to be often violated. As examples from other countries show, there need not be a supervisory bias against using LoLR facilities. These steps would make the discount window closer to that of other central banks.

A second step, in addition to reforms to pricing and (perceived) access conditions, would be making improvements to collateral pledging and management in the United States and other countries to meet the

faster liquidity runs. While in many countries, collateral eligibility for LoLR is already broad, some still have limitations.<sup>15</sup> While collateral frameworks tend to expand eligibility when a large shock happens, given the high speed of runs these days, doing so in the middle of a liquidity crisis makes for significant operational and risk management challenges. In the United States, there are furthermore many operational frictions that hinder the effective pledging and substitution of collateral, notably so for loans that must be collateralized through a third party or an audited borrower-in-custody arrangement. The experience of the European Central Bank, the Bank of England, and other central banks shows that, albeit with significant effort, many forms of collateral can effectively be pledged and made available for LoLR in a timely manner. But the current US system is too cumbersome, is not fully harmonized across the regional Federal Reserve Banks, and uses outdated processes and technologies. Improvements in its functionality will require significant enhancements on both the Federal Reserve's and commercial banks' sides.<sup>16</sup> As in other jurisdictions, this needs to be supported by having supervisory agencies encourage preparedness, and by assuring that related requirements are in place at commercial banks.<sup>17</sup> Looking forward, institutional improvements, including possibly operating 24/7, are necessary in many jurisdictions to keep up with a rapidly changing ecosystem, including instant payment systems and the increased digitalization of payments.

***Making LoLR systems more effective requires banks to pre-position enough collateral at the central bank to cover all of their runnable liabilities. This includes all liabilities, except capital, senior and subordinated debt with more than one year remaining until maturity, swap liabilities, and fully insured deposits.***

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<sup>14</sup> Most other aspects, such as the ability to prepay loans without penalty, would be retained.

<sup>15</sup> While loans represent the bulk of all collateral currently pledged to the Fed, banks pledging are typically smaller institutions and, for them, loans are valued using internal models. Larger banks must provide more information on the characteristics of the collateral that they pledge, which can take time and create delays.

<sup>16</sup> For specific suggestions, see McLaughlin (2023).

<sup>17</sup> For the United States, the July 28, 2023, updated Interagency Policy Statement guidance on liquidity risks and the use of LoLR is a good step in this regard (for example, it states: "Operational readiness includes establishing borrowing arrangements and ensuring collateral is available for borrowing in an amount appropriate for a depository institution's potential contingency funding needs"), but also the guidance provides an indication of the need for further work, notably as to pre-positioning.

The pricing, stigma, and collateral management adjustments are necessary but may not suffice to get all banks ready to potentially use LoLR facilities effectively. Stigma may remain. Some (poorly managed) banks may not want to prepare themselves sufficiently and make the necessary operational investments. Banks should therefore be required to pre-position enough collateral at the central bank to meet all of their “runnable” obligations (with a margin added to account for volatility and uncertainty in collateral values and runnable liabilities). The definition of runnable obligations would be all liabilities, except for capital, subordinated debt, long-term senior debt, and other claims with (remaining) maturities of more than one year, as well as all fully insured deposits. Capital, subordinated, and long-term senior debt are obviously not runnable liabilities. Claims with more than one-year remaining maturity do not represent liquidity risks that need to (or should) be addressed by LoLR.<sup>18</sup> And insured deposits are unlikely to run in the first place if deposit insurance works effectively.<sup>19</sup> In other respects, the terms of the lending with pre-positioned collateral would remain as those for LoLR, possibly modified (for example, in the United States for pricing).<sup>20</sup>

To make this regime efficient for banks, the definition of a high-quality liquid asset (HQLA) itself requires some adjustments, including clarifying which types of HQLA can also be available as collateral to pre-position for LoLR.<sup>21</sup> Relatedly, rules for pre-positioning could vary depending on whether the pledged asset is valued in markets on a continuous basis, and on the ease and timeliness with which

it can be moved to the central bank. In the United States, for example, while government and other securities (that is, federal government agencies, government-sponsored enterprises, and certain supranationals) held in Fedwire Securities and traded continuously can be moved in time for same-day LoLR liquidity, the infrastructure and technology need to be upgraded to facilitate this for other traded securities such as, non-agency mortgage-backed securities and corporate bonds. Collateral substitutions should also be streamlined.

Any adjustment (for example, for maturity and to HQLA) would obviously need to have limits. Too much discretion could end up creating complexity, including the need to estimate runoff rates and make assumptions on the liquidity of assets, including under stress conditions. There would have to be transparency for financial market participants, so that runnable creditors are assured that the liquidity will always be available to pay off their obligations. And all the rules and practices would need to be uniform in the respective system, for example, in the United States across all regional Federal Reserve Banks, and in the euro area across all national central banks.

***Except for those banks with highly risky funding models, most banks need not make large adjustments under an improved LoLR regime, and a natural phase-in would follow, but it does require upfront investments.***

As capital, subordinated debt, longer maturity claims, and insured deposits require no pre-positioning of collateral,

18 Since even in extreme situations, not all runnable liabilities, including derivatives (for example, swaps), can run within 24 hours, one could adjust more for maturity. Obviously, at any time, the effective amount of collateral pre-positioned would have to exceed (by an appropriate margin) at least all liabilities that could run (even if it involves a cost [penalty] on the part of the creditor) within the same day or 24 hours. Additional amounts to be pre-positioned at different horizons could be subject to calibrations (for example, to account for the maximum runnable amounts at different horizons, such as runnable within T+1 and T+2 days, and so forth), and for the liquidity that can be obtained with certainty through other means (for example, the amounts of [short-term] government debt [not pre-positioned] that can be sold within that time horizon under any circumstances).

19 Experience in the United States, such as the Savings and Loan Crisis as well as the recent events, suggests that besides being insured, such depositors do not run because they are confident that they retain full access to their deposits even in case of a failure, given the FDIC's preference for purchase-and-assumption transactions, in which insured deposits are transferred to the acquiring bank over the weekend.

20 The United States needs to ensure consistency vis-à-vis FHLBs and their role in any type of lending that comes close to LoLR lending. If pre-positioning rules and operational requirements are such that banks see little advantage in accessing the FHLB in the first place (as their liquidity is fully guaranteed at reasonable [prospective] costs), then FHLB lending and the associated lien may not arise in the first place. Short of that, there is probably scope to improve the fungibility of collateral across FHLBs and the Fed to avoid “last minute” scrambling and insufficient time to secure LoLR lending.

21 Collateral pre-positioned at the discount window is not included in the calculation of HQLA for the liquidity coverage ratio (LCR). At the same time, repeated experience shows that types of HQLA vary as to their effective liquidity, especially in times of stress, yet all are treated equally from a regulatory perspective. In contrast, after haircuts, different types of HQLA all receive the same liquidity through LoLR facilities. This discrepancy in treatment could create ambiguity. Adjustments could also be useful depending on other regulatory changes (for example, assets not marked to market in the hold-to-maturity book should no longer also be considered HQLA).

the amount of collateral that a bank has at its disposal would generally exceed the amount of runnable liabilities, and most often by a significant margin. Those (smaller) banks that fund largely themselves with insured deposits would thus not need to make many adjustments and would have to pre-position a relatively small share of their assets. In normal times, the impact on lending of requiring pre-positioning would thus be limited for these banks. At the other extreme, a bank funded mostly with uninsured deposits, like SVB, may not have enough collateral to pre-position. In such a case the pre-positioning requirement provides a welcome (extra) incentive for such a bank to adjust its funding structure.

While larger (clearing, money center) banks likely have much collateral, they are also large users of collateral for their derivatives and other wholesale businesses. An empirical question is whether the amount of collateral required to be pre-positioned, being encumbered to some degree, would limit their margin-intensive businesses. If so, a careful review of banks' funding structure, collateral

management, and operations will be necessary to judge whether any adjustments would be justified (for example, whether their business accounts are at risk of being moved within 24 hours, and whether a late-day pledge to the central bank of collateral used for derivative business is still feasible, given the location of the collateral, the time zone the bank is operating in, and other such constraints).

Table 1 shows the distribution of banks' runnable liabilities as a share of cash and potential collateral sources for three size classes (greater than \$250 billion, 13 banks; \$50 billion to \$250 billion, 37 banks; and \$1 billion to \$50 billion, 931 banks), without and with accounting for already pledged securities.<sup>22</sup>

For nearly all banks, the collateral available was sufficient to cover all runnable liabilities. When accounting for already pledged securities, the coverage at the 90th percentile was tightest for the largest banks, at 92 percent. But, even for this group, just one bank had runnable liabilities that exceeded its available collateral. In the mid-sized category, and again accounting for already pledged securities,

**Table 1: Runnable liabilities as a share of cash and potential collateral sources**

*By percentile, end 2022*

|                            | UNINSURED DEPOSITS AND ST LIABILITIES AS A SHARE OF CASH AND COLLATERAL |      |      |      |      |      |      |      |      |
|----------------------------|---|------|------|------|------|------|------|------|------|
|                            | 10th  | 20th | 30th | 40th | 50th | 60th | 75th | 80th | 90th |
| Greater than \$250 Billion | 27%   | 34%  | 39%  | 43%  | 45%  | 45%  | 53%  | 53%  | 65%  |
| \$50–\$250 Billion         | 14%   | 31%  | 33%  | 45%  | 45%  | 52%  | 56%  | 59%  | 65%  |
| \$1–\$50 Billion           | 8%  | 18%  | 21%  | 29%  | 33%  | 37%  | 43%  | 45%  | 52%  |

|                            | UNINSURED DEPOSITS AND ST LIABILITIES AS A SHARE OF CASH AND COLLATERAL LESS PLEDGED SECURITIES |      |      |      |      |      |      |      |      |
|----------------------------|---|------|------|------|------|------|------|------|------|
|                            | 10th  | 20th | 30th | 40th | 50th | 60th | 75th | 80th | 90th |
| Greater than \$250 Billion | 32%   | 35%  | 42%  | 45%  | 49%  | 49%  | 54%  | 55%  | 92%  |
| \$50–\$250 Billion         | 14%   | 32%  | 35%  | 45%  | 50%  | 56%  | 64%  | 65%  | 78%  |
| \$1–\$50 Billion           | 8%  | 20%  | 24%  | 31%  | 35%  | 40%  | 47%  | 49%  | 58%  |

Note: Sources of collateral as cash and balances due from depository institutions, all securities reported at fair value, and all loans. Since many short-term liabilities and some uninsured deposits already have collateral pledged against them, reported pledged securities should be subtracted to avoid double collateralizing. Runnable liabilities—those most susceptible to a run or not being rolled over—are defined as the sum of uninsured deposits (as reported by banks), federal funds purchased, securities sold under agreements to repurchase, and FHLB advances, other borrowed money, and subordinated notes/debt with maturity of less than one year.

22 FDIC 2022.

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there was no bank other than SVB that fell short. In the small-sized category, only 10 of 931 banks had insufficient collateral, and these generally had specialized business models (for example, brokers, foreign bank subsidiaries).

In Table 1, no haircuts were applied to the collateral. Applying the prevailing margins per FRBNY schedules to the various classes of collateral, including loans,<sup>23</sup> increases the number of banks for which runnable liabilities exceeded available collateral. Among the largest banks, using a range of haircuts applied to loans, there were two to five banks for which coverage was insufficient, that is, margined collateral was less than runnable liabilities. In the midsized group, accounting for collateral haircuts resulted in two additional banks (including SBNY) with insufficient collateral. Accounting for both haircuts and already pledged securities, some five midsized banks fell short. Many more banks fell short when also subtracting pledged loans. Among the nearly 1,000 smaller-sized banks, only 20 fell short after accounting for margins on collateral, and just 30 fell short when also correcting for already pledged securities (but not for pledged loans).

This analysis suggests that the requirement of prepositioning of collateral would only be binding for a few banks, often those with atypical business models. This constraint, of course, could be addressed by issuing more longer-term unsecured debt, attracting more insured deposits (which would increase competition in the retail deposit market), reducing uninsured deposits, or reducing their lending (particularly in higher haircut categories (for example, bespoke, heterogeneous, hard-to-value loans). Thus, the adjustment costs for the banking system would be low, with a limited impact on banks' overall role in financial intermediation.

That said, the amount of constraint and the resulting adjustments require more detailed analysis. Does the proposal strike the appropriate balance between constraining

extreme bank business models and not impacting the ability of the banking system to perform its financial intermediation function? If, after this analysis, policy-makers were to determine that implementing the proposal alone would be too arduous, one could adjust some of the other regulations and rules affecting banks.

Overall, collateral demands should be manageable for banks. Furthermore, at least today, central bank reserves are generally in "excess," so the aggregate impact of introducing this LoLR regime now could be small and, as this will of course change over time, a phase-in would naturally follow.<sup>24</sup> Nevertheless, operational aspects become more important with a larger spectrum of assets, and it will be necessary to assure the LoLR system is equipped to handle large-scale collateral use and can disburse liquidity within a few hours. For some jurisdictions, like the United States, this will likely require substantially upgraded supporting technology and systems to assess and process collateral, assure robust and efficient liquidity delivery, have sufficiently granular asset classifications and haircuts, and allow for substitutions of collateral by banks.<sup>25</sup> It will likely also call for more staff at central banks, since at times human interventions will be needed (for example, to assess the quality and haircuts of collateral, particularly of the irregular type).

***Compared to other proposals, our approach addresses liquidity stresses at lower cost for most banks and more limited costs to central banks.***

A more extreme version of this proposal would require commercial banks to post enough collateral, after accounting again for haircuts, at the central bank for all runnable obligations (including insured deposits and short-term borrowings). It would do away with the LCR and HQLA requirements, as the posting would assure 100 percent of any potential liquidity needs, and it would not envision

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23 This is approximate because margins vary greatly, especially for loans.

24 The experience in the euro area in March 2023 is illustrative in this regard: being flush with central bank reserves, often the result of facilities provided at preferential rates, liquidity issues were limited. Going forward, this ample reserve regime will change, and the European Central Bank is already planning to change its pricing and access policies.

25 The haircut system will need to be robust. In normal times, the scale of collateral available will likely much exceed the volume of runnable liabilities, and haircuts will not be a constraint. But in times of systemic stress, with high demand but limited supply of collateral, and possibly hoarding of liquidity by some banks, haircuts could not only bind for some banks, but take on systemic importance. In the extreme case, they may be too high to assure sufficient liquidity availability at the system level (regardless of whether or not liquidity is extended). This could force banks to raise capital or shrink their balance sheets, which may be hard or even undesirable at such times. It could result in haircuts taking on systemic importance, which then could lead to pressures to lower them.

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having deposit insurance or any committed liquidity facility. This is in essence the “pawnbroker for all seasons” (PFAS) of Mervyn King and Paul Tucker, which also extends such access to nonbanks.<sup>26</sup> While there are many parallels, the proposal here is far less reaching than the PFAS as it explicitly excludes insured deposits (and some other claims) and still forces banks to self-insure, including through HQLA. The King-Tucker proposal would have a far greater impact on the ability of banks to continue to provide intermediation services between savers and investors. Under their model, the banking and financial system would be safer, but almost certainly much smaller.

The net effect of our proposal would be to ensure that a liquidity-stressed bank would have access to backstop funding, providing more time for the bank to raise capital and reorganize itself. It would also make for fewer contagious runs from those banks that are not subject to solvency issues themselves. Those that do will obviously still need to be resolved or otherwise addressed. Most importantly, if depositors and other runnable liability holders know that the central bank stands ready to provide liquidity to pay off their and other runnable obligations, and such capacity is viewed as credible, then they will see less reason to run in the first place.

Of course, any LoLR system, whether involving pre-positioning or not, does not solve all problems and can come with some costs. One important constraint at the individual bank level is that any LoLR use that involves replacing low-cost (retail) deposits with more expensive (LoLR) funds increases the overall funding costs of the bank at a time when its capital adequacy and franchise value are likely in question.<sup>27</sup> That said, the example of First Republic in the United States is instructive. First Republic borrowed from the discount window in March 2023, which allowed time for a more orderly resolution

when the bank failed. A more accessible LoLR can increase moral hazard, at the level of individual banks and the overall system, by allowing for greater risk-taking and less self-insurance, including through more aggressive liquidity management. In the face of an ever-increasing ease of deposit withdrawals, this could be a concern. However, LoLR haircuts are set conservatively, that is, at the highest (“tail”) credit losses for the specific asset class, and a spread is charged, so there should be no losses to the central bank. Similarly, the scheme would thus not amount to an explicit subsidy to banks. It would, however, require, in addition to some changes to existing liquidity regulations, enhanced supervision, notably to track runnable liabilities, including those arising through off-balance-sheet activities.<sup>28</sup> Each bank could disclose the amounts of pre-positioned collateral (to assure runnable liability holders), while the central bank would report aggregate data on pledged collateral for possible LoLR use.

***A revised LoLR system could complement other liquidity provision mechanisms.***

There are other liquidity backstop options. Instead of banks holding HQLA, the central bank could offer committed liquidity facilities (CLFs) to commercial banks that would count toward their usable liquidity. For these, the same requirements (collateral and use of haircuts) as for standard LoLR would apply (for example, access criteria would be that the bank is financially sound, or, in US supervisory agency language, “not critically undercapitalized”). CLFs could be offered for free, using the same arguments as to why access to (not use of) the LoLR is for “free,” or require a fee.<sup>29</sup> Its pricing, both of any fees and the costs on funds drawn, would have to be calibrated like (other) LoLR facilities. Access would have to be for an unlimited time, that is, unless the central bank decides the

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26 See, further, King 2016a and 2016b and Tucker 2014 and 2019.

27 This was likely the reason why the liquidity support in the case of First Republic Bank (organized by the private sector) did not calm concerns, as it came with higher cost and put (further) pressure on its profitability.

28 This needs to consider that many margin calls and related collateral requirements are typically tied to credit ratings. A credit downgrade below some threshold may then result in higher collateral requirements vis-à-vis counterparties. So, there could be a risk of a collateral crunch for large banks with a lot of derivative business and exposure.

29 In the Bank Policy Institute proposal (June 22, 2023), to qualify for LCR treatment under Basel rules, the CLF would require a fee. While such a fee would not be high, the current Basel rules only allow for access to be counted as HQLA if fees are relatively high, presumably to discourage excessive reliance on such facilities (to ensure similar incentives to manage liquidity risks using a CLF as with using HQLA). These and other rules would need to be adjusted to align with other liquidity rules.

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bank is no longer financially sound or the bank decides it no longer needs or wants the CLF. The combined amounts of liquidity available through the CLF and from the ability to sell HQLA (possibly adjusted for its liquidity) would be counted toward meeting the LCR.<sup>30</sup> At the same time, to have assured liquidity in times of stress, the pre-positioned collateral for LoLR would have to be equal to (or exceed) the total of runnable liabilities.

Relative to pre-positioning, the CLF would have more self-insurance elements. By complementing the required pre-positioned collateral and associated access to the LoLR, CLFs would provide banks with additional asset and liability management flexibility.<sup>31</sup> Most importantly, relative to holding HQLA, and like pre-positioning, CLFs would reduce the aggregate demand for (certain types of) collateral and the related socially unproductive cost of tying up assets at some banks, enhancing their ability to intermediate.

Additional liquidity provision options could be implemented during times of systemic stress. Central banks could introduce standing and “targeted” facilities with longer duration and broader collateral eligibility. The facilities established by many central banks during the global financial crisis, the COVID-19 pandemic, and in March 2023 are examples of such additional tools. But these ex-post facilities will not necessarily be thought of as being available ex ante, and thus may not deter runs or assure runnable liability holders. (Of course, if uninsured depositors have such expectations, banks may self-insure less). Such large-scale support mechanisms do have risks and costs, as, for example, if haircuts are insufficient to cover losses or are allowed to be negative (as in the case of the recent Bank Term Funding Program), when many financial institutions are at risk of failing, or the central bank incurs losses on the assets it has purchased.

## **B. Deposit insurance.**

*Given faster withdrawals, some have suggested more extensive deposit insurance to help avoid runs.*

The fact that uninsured depositors can and do (suddenly) run was well-known, even before the latest events. In earlier cases of failures, going back to the global financial crisis or even before (such as the demise of Continental Illinois in 1984), banks saw large outflows from uninsured deposits and other claimholders in short periods of time. Thus, runs by uninsured depositors are not new.<sup>32</sup> But this risk is more relevant today globally. In the United States, uninsured deposits now account for some 43 percent of all deposits, up from some 20 percent in 1990.<sup>33</sup> They represent \$7.5 trillion of the \$19.6 trillion in total runnable liabilities in the US financial system. With technological advances, such as mobile and online banking, the speed of withdrawals has increased substantially, and even relatively small uninsured (and insured) depositors can now move funds overnight or even intra-day. And with the expansion of the internet and social media, the scope for (correct or false) information to be spread more widely has increased dramatically. Going forward, this all makes speedier and larger runs more likely without offsetting mitigating actions.

*Higher deposit insurance can mean greater funding stability and less contagion, but at a cost.*

Greater insurance coverage will obviously reduce the flight risk of large amounts of deposits. But, as noted, the fraction of uninsured deposits has risen to a very high level for some US banks of varying sizes. For SVB and SBNY, at the end of 2022, uninsured deposits represented more than 90 percent of total deposits, and for FRC 68 percent. So, a big increase to the insurance coverage per account would be needed to meaningfully reduce the share of liabilities likely to run. And any remaining uninsured depositors and other creditors are likely to remain skittish

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30 Access to the CLF could be treated in the LCR calculations as an HQLA (in the numerator) or, alternatively, to avoid complicating comparisons of the ratio over time, as a projected cash inflow (in the denominator).

31 Note that in the case of the United States, there are legal differences between how the Fed can provide a CLF to a bank compared to a bank holding company, which makes a CLF less useful for a bank holding company (see Nelson 2023).

32 To a lesser extent, insured depositors can run too. For example, in the 2007 case of Northern Rock (UK), deposit outflows of some 20 percent by both uninsured and insured deposits brought the bank down in four days. In contrast, the United States has experienced virtually no runs of insured depositors, because it has a regime in which such depositors do not lose access to their funds.

33 FDIC 2023.

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once a panic starts, and will still run when there is any doubt about the safety of their investments.

Importantly, there are costs of higher deposit insurance. Even when a bank's solvency or quality of its management is not currently in question, protecting all depositors ex ante is costly, as this increases moral hazard. It can, in the absence of adequate supervisory actions, lead to zombie banks and related zombie lending. In the case of already existing underlying weaknesses, the share of overall losses to be borne by capital and unprotected depositors and debtholders will only increase if insurance limits are raised. However, leaving some deposits uninsured provides little market discipline; uninsured depositors act only at the very last stage, when it is too late to change a bank's management or operations, exerting no discipline beforehand for those banks with a poor business model or management.

At the same time, with less than full deposit insurance, the risk of contagion remains. And relying on the systemic risk exception on an ex-post basis, which has happened now twice in 15 years, is costly, too. It creates an impression of a very large safety net, yet it provides too little reassurance ex ante to prevent runs of those uninsured depositors. It can be implemented only on a case-by-case, ex-post basis. The question thus remains whether there is a better way to calm depositors through changes to the level and scope of the coverage or other changes to the insurance.

***Deposit insurance reform options include unlimited coverage, no change, or limits that depend on a bank's risk profile, with options varying in cost, required complementary actions, and incentives to reduce bank risk-taking.***

In terms of changing the insured limit, three options are being considered. The first option is to cover demand deposits up to any amount.<sup>34</sup> This would be a very large contingent liability, however, since, as noted, the amounts to be covered are large and would probably become much larger under this option. And this option would eliminate any deposit discipline and certainly increase risk taking by some banks, even with much higher capital adequacy and liquidity requirements (just imagine a few very large

investors setting up a bank to take a gamble on some investment funded largely with insured deposits). Even much improved supervision would not likely detect the myriad ways in which risks can build up in a short period of time, let alone assure quick enough intervention and correction.

The second option would be to keep the limit as is (or only marginally increase it).<sup>35</sup> In contrast to the unlimited coverage option, this would do little to enhance financial stability. While it retains a system with many elements that have worked well (including in general for the supervision and resolution of small banks), it does not address the larger and growing share of uninsured deposits and their increased flightiness. While this option can be further supported by higher capital adequacy requirements and regulations that reduce the reliance on uninsured deposits and increase liquidity buffers, such as higher runoff ratios under the LCR, this is unlikely to be efficient. As argued above, a substantially improved LoLR system requiring enough pre-positioned collateral would de facto rule out business models that rely to a large extent on uninsured deposits, and instead allow banks themselves to choose a mix of more capital, more subordinated debt, and more insured deposits (or to adjust their asset mix).

The third option would be to adjust the insurance limits for banks in an incentive-aligned manner, that is, in accordance with behavior consistent with a reduced risk of failure or liquidity stress. This assessment could be based on quantity-related indicators (for example, asset growth, reliance on uninsured deposits and other runnable liabilities, the concentration of business activity, the degree of asset and liability management mismatches), and qualitative supervisory metrics. This option could keep the current insurance cap (\$250,000 for the United States, €100,000 for the European Union [EU]) in place for all banks. But to go above that would require less risky business models, including relying on stable sources of funding. By using mostly quantity-based criteria, it would create strong incentives to stay within certain parameters and address, in part, the weak incentives related to pricing (risk-based deposit insurance assessments have not worked to sufficiently deter risk-taking).

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<sup>34</sup> Option 2 of FDIC (2023).

<sup>35</sup> Option 1 of FDIC (2023).

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***Other possibilities are higher limits in stress times, insuring all corporate deposits, and better pricing, each of which has significant challenges.***

One option implicitly always available is to keep the limits (largely) unchanged, but broaden and/or raise them during periods of financial instability. Here, one could provide more discretion to authorities to invoke such “systemic exceptions.” For example, higher deposit insurance limits could be put in place when non-idiosyncratic risks increase significantly, for example, due to changes in the macroeconomic environment. Obviously, this is not easy to formalize in a way that it provides reassurance to depositors *ex ante* (for example, what are objective indicators of macroeconomic risks), without creating excessive moral hazard or without sending a negative signal about the overall situation, exacerbating stress.

Separately, there could be an insured category just for corporate transaction deposits. The argument is that these deposits are needed for payroll, working capital, and other operational needs, and can be very large. One idea would be to cover these transaction accounts fully, that is, without any limit. The practical problems of insuring such accounts become considerable, however. For one, defining corporate uses for transactions and true ownership is difficult, and regulatory arbitrage can easily follow. Furthermore, the pricing of such insurance would have to differ from other types of deposits (given their size, the premiums charged could be substantial), to avoid unintended consequences and incentives. An alternative approach would be to require such business accounts to be fully collateralized. While this would avoid both credit and liquidity risks, it is less efficient than pre-positioning collateral for all runnable liabilities at the central bank, as it ties up collateral fully and for one specific type of account only.

In addition to changes to the insurance amount and coverage for corporate deposits, it would be useful to try to alter incentives through improving the setting of the insurance premiums (“assessments”), notably as to their risk basis. Historically, this has been difficult, largely as the incentive effects from fees are to a degree too limited to encourage better risk management in a timely manner. De facto, the premiums charged to failed banks have typically fallen short of actual risks incurred (which shows up in

the deposit insurance agencies like the FDIC having, on average, losses, which are subsequently recovered by higher premiums charged to the remaining banks). Nevertheless, there appears to be some scope to improve pricing. One suggestion would be to make the pricing dependent on having sufficient liquidity buffers, including the degree of pre-positioning for LoLR coverage of uninsured deposits.

### **C. Resolution**

***Having a viable resolution system is a necessity for sound banking but is still a work in progress globally.***

For any well-functioning banking system, a good resolution system ensures that those banks taking too much risk or underperforming exit without destroying value or creating havoc for other banks. And it can help keep the public sector cost of bank restructuring low. However, and notwithstanding the large efforts spent since the global financial crisis on improving the resolution framework for globally systemic banks (G-SIBs), domestic systemically important banks, and other banks, there are still many frictions and deficiencies. Credit Suisse (CS) was sold to another G-SIB, not resolved, even though resolution was considered *ex ante* to be a viable alternative. The specific decisions made in that case, notably as regards the Additional Tier 1 (AT1) instruments, adversely affected financial markets broadly. Arguably, uncertainty was high, leaving little choice. And the solution chosen was possibly Swiss-specific (for example, a preference to avoid state ownership and/or keep a local owner). But the goal should be an orderly resolution, with limited spillover, and efficient from a longer perspective, not an ad-hoc outcome dictated by circumstances. And the framework should be as robust as possible to the unavoidable political economy influences and cognizant of the difficulties in coordinating resolution across borders.

In the United States, the contrast between the resolutions of SVB and SBNY and the resolution of FRC provides instructive examples of the important interactions of resolution mechanisms with LoLR. SVB and SBNY failed so quickly in part because they had not set up access to the discount window. And because they failed extraordinarily quickly, the regulators could not resolve



them without invoking a systemic risk exception and insuring uninsured depositors, in order to contain contagion to the rest of the banking system. In contrast, FRC did borrow from the discount window (as well as elsewhere). When FRC was ultimately determined to be insolvent, the FDIC resolution was relatively orderly and did not require taxpayers to backstop uninsured depositors.

***Funding needs for resolution are large, and in multiple currency and cross-border instances, execution is difficult and risks are high.***

In several respects, the current framework is still not truly workable, especially for large, complex banks operating in multiple jurisdictions. An important gap is the provision of liquidity. Runs and cutoffs from counterparties are even more rapid these days, yet a workable resolution needs some time. Funding mechanisms are thus key to being able to “get to the weekend.” Estimates for the large, systemic EU banks<sup>36</sup> suggest that at least €200 billion in funding is needed. Amounts are likely similar or even greater for US banks. The funding and guarantees extended by the Swiss National Bank and the Swiss government to CS confirm this order of magnitude. While likely manageable for the United States, for the EU, the mobilization of such funding remains a work in progress. And globally, much more effort is needed to assure both effective public sector liquidity backstops, available in the right currency, as G-SIBs transact in many different currencies, and the operational readiness of banks to access them.

In addition, identified legal and execution issues need to be addressed during resolution planning, to better operationalize the range of resolution options (such as the transfer and sale of business tools), and to better understand the impact of bail-in on financial markets. Since large bank resolutions are rare, authorities need to continue to prioritize testing and simulating for resolution both at the domestic and international levels, including to develop multiple alternatives as to how to unwind complex operations; test effective decision-making and execution under time pressure; and assure communication and

coordination efforts cover all jurisdictions and authorities affected, including those outside the core crisis management group and securities markets regulatory agencies.

Short of a workable resolution framework, some elements of the framework associated with it (such as living wills, Total Loss Absorbing Capacity) may need to be revisited. For example, while in the case of CS, loss absorber capacity was greater because of the write-down of the AT1 instruments, an orderly outcome still necessitated government support.

### **III. 2. How to prevent and reduce bank failures and liquidity stresses**

Preventing bank failures is obviously preferable to liquidity and other forms of support, and to restructuring and resolution. Several reforms could help improve banks whose business models present not only risks to their stakeholders but to the overall banking system. These include better corporate governance (internal and external), revised accounting rules, and improved supervision, including more comprehensive stress tests. These reforms are often considered low-hanging fruit, as they present limited costs for banks that are managed well. Applied to all banks, they can increase the stability of banking systems.

#### **A. Bank management and external governance weaknesses.**

***Internal and external governance failed in addressing poor risk management and weak operations.***

Earlier G30 reports have stressed the importance of proper culture and governance in banks, nonbank financial institutions, and supervisory agencies.<sup>37</sup> The events of March 2023 again illuminated poor bank conduct and cultures within certain firms’ boards and senior management. Failures were particularly stark in risk management, such as interest rate risk. Clearly, a highly stimulative monetary policy and quantitative easing, which swelled bank

36 Per the European Stability Mechanism/Single Resolution Board.

37 Group of Thirty 2012; 2013; 2015; 2018.

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deposits, encouraged excessive risk-taking, notably making bets on interest rates remaining low. But such risk-taking was not pervasive among most other banks.<sup>38</sup> For the failed banks, however, neither internal nor external governance worked to restrain bad behavior and poor decisions.

Internally, management of the failed banks did not focus sufficiently on how risks were managed. More generally, some of the basic internal governance elements (such as regular risk reporting, independent risk control) were missing or ineffective. Notably, several of the failed banks had weak risk management or no Chief Risk Officer (CRO) in place (SVB had no CRO for eight months before it failed). Similarly, these banks' boards fell short as they did not challenge management's weak risk and other control functions. The concentrations in asset and funding structures and skewed business models were rarely disputed and not sufficiently addressed. In the case of CS, the high turnover in senior management exacerbated the weaknesses in the control functions and internal governance. For some banks, deterioration in operating results may have added to incentives to take risks, including interest rate risks.

Externally, governance also fell short. Supervisors, depositors, shareholders, and other stakeholders, including banking analysts and rating agencies, were not sufficiently attuned to or equipped to address the excessive risk-taking. Instead, their focus was often on narrow measures of banks' reported profitability, capital adequacy, and liquidity positions, and was concerned with dividend payouts. These accounting indicators and payouts generally did not indicate signs of increasing stress. Applicable regulatory ratios were almost always all met.<sup>39</sup>

Failures in bank management and lack of timely market discipline are not new. Admittedly, many stakeholders do not exercise timely governance or exert market discipline with respect to banks. Creditors may furthermore have been lured into a false sense of safety following a long period of few bank failures and reassuring statements from

rating agencies, and the public sector, as to the soundness of banks. Indeed, some of the deficiencies found in the banks that failed are not unique, as exemplified by the many other US banks that ended up with large mark-to-market losses on their securities holdings. The FDIC estimated the valuation loss on security holdings for the whole US banking system at around \$620 billion; when the losses on loans are included, the number rises to \$1.7 trillion.<sup>40</sup> But most banks did not also have risky funding structures. The many examples of banks with good practices in risk management provide the elements of internal and external governance reforms that can make such practices widespread.

***The governance changes needed include stronger internal risk management oversight, with the CRO reporting to the board, greater board independence, and better aligned compensation schemes.***

One important reform would be to strengthen banks' internal risk function. Depending on the specific bank's current arrangements, this can call for several steps: enhancement of the authority of its CRO, including mandating that they directly report to the board of directors; assuring the independence of the three lines of defense, with regular reporting, in some summary form, directly to the board of directors; and putting in place the requirement for all banks above a size of, say, \$50 billion in assets, to regularly conduct internal stress tests for external shocks and other potential adverse events, with reporting of such results to the board and possibly made public.

A second, and more general, requirement would be to increase the independence of the board of directors and enhance its challenge function. Depending again on the specific case, it can additionally call for a larger share of independent directors on the board. Besides reporting by the CRO, it can also call for mandatory additional and

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38 As the FDIC states: "Strong corporate governance is the foundation for safe-and-sound operations. Effective governance frameworks help maintain profitability, competitiveness, and resiliency through changing economic and market conditions by incorporating objectives, policies, and risk limits that are appropriate to the size, complexity, and risk profile of the institution. Directors are responsible for providing a clear governance framework and for monitoring the extent to which officers and employees comply with this framework, and with applicable laws and regulations" (<https://www.fdic.gov/resources/bankers/corporate-governance-and-auditing-programs/corporate-governance/>).

39 For example, FSB (2023) notes that the banks that failed were not outliers in terms of reported capital or liquidity ratios.

40 Drechsler, Savov, and Schnabl 2023a.

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separate reporting to the board by some committees (for example, audit, governance, risk) without CEO approval.

A third proposal would be to change the incentives with respect to risk-taking by making compensation less short term and equity based and significantly strengthening clawback provisions. While controversial,<sup>41</sup> there are significant arguments for such policies. This is especially so for firms engaged in financial services provision, as their risks can more easily be skewed than for other firms by taking large positions, with commensurately large (short-run) payoffs for its employees.

These changes, while obvious in many ways, can be far-reaching. They will generally involve reforms to laws that have been proposed before but that often failed to gather enough support. They also require greater involvement of shareholders in the management of firms, which has been on a declining trend, in part as actively managed funds have declined as a share of the total investor base. They will thus be difficult. However, given their special status, supervisory agencies can impose some of these governance changes on banks directly.

## **B. Accounting rules.**

### ***The events brought to light several accounting deficiencies.***

There are a few important weaknesses and contradictions in how accounting and other financial reporting regulations in the United States affect banks, notably, but not only, as to interest rate risk management. Few of the US banks appeared to have formally violated the various regulations in place for their specific type of bank (at least not until just before their failures).<sup>42</sup> But the bank failures, and more general analysis, show that current accounting and regulatory rules do not fairly reflect banks' profitability, capital, and long-term viability, and present in several respects some significant distortions to bank operations

and risk management. Given that many of these weaknesses are largely unique to the United States, the solutions should be relatively straightforward.

### ***Weaknesses center on too much discretion in the reporting and treatment of valuation changes, including those related to interest rate changes, and inconsistencies with liquidity rules.***

First, and notably, under current rules in the United States, some classes of banks are allowed to classify securities as hold to maturity (HTM), with little or no regard to the term structure of the liabilities funding these assets. Specifically, banks can classify securities bought for their own book (that is, not in their trading book) in two ways: as HTM securities, which can then be carried at amortized cost with no recognition of unrealized gains and losses; or as securities "available for sale" (AFS), for which they need to recognize any valuation changes immediately. Banks have much discretion to classify securities in either group, including being able to vary that over time. In the specific three bank failure cases, when interest rates rose, the losses on long-dated securities in the HTM book consequently did not need to be realized. Put differently, banks were able to run large asset-liability mismatches with limited consequences. At the same time, the banks continued to assume that deposit rates would not need to rise quickly or run. The latter assumption made the implicit hedge thus very much a wrong-way exposure.

A second and related accounting issue for US banks is the so-called "accumulated other comprehensive income" (AOCI) regulatory filter. While banks need to recognize valuation changes for the AFS-held securities, not all banks are required to feed such valuation fluctuations through the capital account (unlike for other valuation changes).<sup>43</sup> Instead, banks can collect these gains and losses in the AOCI, a component of owners' equity. This adds

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41 The EU has a much-debated cap on compensation (see, for example, Colonnello, Koetter, and Wagner [2023]); and a clawback proposal is currently under review in the US Congress.

42 In the case of Credit Suisse, as stated by its supervisor and the Swiss National Bank when it provided emergency liquidity, its capital and liquidity ratios using standard accounting concepts were above local regulatory requirements (which are stricter than international standards).

43 The AOCI filter was in a phased manner removed for advanced approaches banks beginning on January 1, 2014, but remained in force for all other banks (see Kim, Kim, and Ryan 2023a). ("The Advanced Approaches capital framework requires certain banking organizations to use an internal ratings-based approach and other methodologies to calculate risk-based capital requirements for credit risk and advanced measurement approaches to calculate risk-based capital requirements for operational risk" (<https://www.federalreserve.gov/supervisionreg/basel/advanced-approaches-capital-framework-implementation.htm#:~:text=The%20Advanced%20Approaches%20capital%20framework,capital%20requirements%20for%20operational%20risk.>).

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further to the discretion banks have in managing their capital adequacy and income reporting, making again for perverse asset and liability management incentives.

Third, the accounting treatment of allowing some assets to be HTM and not mark to market (MTM) is completely inconsistent with counting these same assets as HQLA. For these assets to be of any liquidity use (by selling in financial markets or for borrowing via repo, from the FHLBs or at the discount window), they would immediately have to be marked to market. Yet, current rules state that they need not to be marked to market if they are in the hold-to-maturity portfolio.<sup>44</sup>

***Discretion allowed in accounting and reporting has led to major financial misreporting.***

Economically, much of the ability to maintain mismatches rides on the assumption that deposits are both sticky, that is, do not migrate quickly, and their costs can be managed vis-à-vis the MTM return on the assets they fund. This could justify some of the discretion in the accounting rules (but not the HQLA treatment of HTM assets). Evidence, not just for the three banks, but more generally, suggests, however, that banks did not use the rules to classify securities as HTM (versus AFS) because they had greater stickiness in their deposits. Rather they did so because it provided them more favorable accounting and financial treatment.<sup>45,46</sup>

While the existing rules are likely due in part to the consequences of the compromises in (international) rules setting, events raise several deeper questions. It is unclear why banks in the United States should be allowed to hold securities as HTM in the first place. Rules in Europe and many emerging markets are less permissive. Banks should at least have to credibly demonstrate that they have the

necessary funding to hold securities and other long-dated assets before they classify them as HTM (and not as AFS). It is also not obvious why banks should have the discretion whether or not to feed valuation losses through capital.

***Possible changes to accounting rules include drastically reducing HTM treatments and greater pass-through of losses to capital positions.***

Several suggestions follow, which will avoid some perverse incentives at poorly managed banks yet would be of little consequence for those banks with proper asset and liability management.

One change would be to eliminate the HTM option and associated amortized cost accounting treatment. Instead, rules would always require banks to mark to market all securities held on their own books, like they already must do for those securities held in their trading portfolio. This would likely be too drastic, as it does not reflect the offsetting change in the value of deposits that do not reprice quickly.<sup>47</sup> One option would be to limit the HTM option to those amounts for which a bank can show it has sustained funding (such as sticky [insured] deposits or longer-dated liabilities). Obviously, this would mean some discretion and ambiguity, for example, as to runoff ratios for various classes of deposits. It would thus need proper supervisory oversight. And even with these changes, there should be a capital charge for the interest rate and funding risks that remain (see the subsection on *Prudential regulation*, below, for more on capital requirements).

Such changes can probably be put in place through supervisory guidance alone or by regulatory changes under existing laws, that is, without requiring new legislation. Although there is already some supervisory guidance in the United States, the current language leaves much

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<sup>44</sup> More generally, there can be inconsistencies in treatments since the various HQLAs are not discounted for their actual liquidity, making banks prefer to hold some HQLA even if of poor liquidity quality (or because of its higher book value).

<sup>45</sup> Kim, Kim, and Ryan 2023b.

<sup>46</sup> Even more perversely, banks have been found to have reclassified about \$0.75 trillion of securities back to HTM from AFS when interest rates rose, thus avoiding accounting losses (Granja 2023). Also, there was a regulatory change in 2019 that reinstated the AOCI filter for some classes of larger banks (it was after the global financial crisis only allowed for smaller banks). And it was exactly these banks that started to take more interest rate risk following the reinstatement (Kim, Kim, and Ryan 2019; 2023b).

<sup>47</sup> Furthermore, some opaqueness in valuations is fundamental to banks' intermediation functions (banks are not money market funds that must mark to market their complete portfolio—that is, assets and liabilities—daily). There is also the practical aspect. For example, loans and the franchise value derived from deposits (as a low-cost funding source) are hard to mark to market (for example, how fast do deposits reprice or what is their effective maturity?).

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discretion to the bank.<sup>48</sup> But supervisory changes would be more impactful if they also involved changes in accounting rules, including legislative changes, if necessary, as that would provide greater incentives to both management and stakeholders to improve a bank's risk management. These changes should apply to most types of securities held and to all types of banks (for example, irrespective of size). Most importantly, the revised rules should not allow for opportunistic use of MTM (by asset class and in terms of timing) by management or shareholders.

A related reform to improve bank management and shareholder incentives would address the interaction between the current MTM/HTM accounting (and supervisory) rules and their impacts on capital and earnings. Clearly, current asymmetries are abused. When gains arise, they often get booked and paid out (to employees and shareholders). But when losses arise, they may not be recognized until a lack of funding forces the sale of the depreciated securities and the losses are realized. Symmetry should be the norm and, correspondingly, the (AOCI) regulatory filter in the United States should be eliminated, at least for banks over a threshold size, for example, \$50 billion, or when securities subject to valuation changes are a significant share of assets (for example, more than 20 percent).

### **C. Supervision, including stress tests.**

*Many supervisory failures, common to earlier cases, have been identified, albeit mostly in hindsight.*

Supervision, which is about the detection of vulnerabilities and the correction through remedial actions, failed in both the United States and Switzerland. In both countries, there were many red flags for the failed banks over several years. These included undiversified business models; very high asset growth; either cyclically high or structurally low profitability, with still large dividend payouts; and falling equity valuations and high certificate of deposit spreads, in

the periods shortly before failure and sometimes considerably earlier. As the outcomes, reports, and statements of senior officials of supervisory agencies now make abundantly clear, the remedial actions were implemented too slowly and were too limited in scope and intensity.

The vulnerabilities of SVB, notably as to its risk management, were documented many times internally by the responsible US supervisory agencies. They were brought to the attention of the agencies' management as well as SVB's senior management and board multiple times.<sup>49</sup> But SVB management did not act on the noted weaknesses and, despite this, was not forced by the supervisory agencies to remedy them in a timely manner.<sup>50</sup> Weaknesses in supervision were also noted in the reports and statements of senior officials of supervisory agencies for SBNY, and to some extent for FRC (and, earlier, Silvergate bank).

In the case of CS, vulnerabilities were recognized by its supervisor, the Swiss Financial Market Supervisory Authority (FINMA), over an even longer period—as early as 2013, according to recent press reports—that is, 10 years before March 2023. The bank had emerged from the global financial crisis in relatively good condition, not needing direct state support (in contrast to the other Swiss G-SIB, UBS). But a string of adverse outcomes then started to highlight several structural weaknesses, notably in risk management and control functions. A high number of regulatory actions by FINMA (some published) did follow. Still, as noted above, little progress was made by the bank in terms of cost containment and profitability enhancement, and its risk management remained poor. The bank was still able to raise additional equity capital following the loss related to Archegos. A full official review (now underway) will undoubtedly show that FINMA should have moved more decisively and earlier. Aspects likely to come up in the review are the agency's limited resources and its high turnover, making it hard for sufficient expertise to be applied relative to its supervisory counterparts in other countries, and its

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48 For example, the Advisory on Interest Rate Risk Management 2010 just states: "The regulators expect all institutions to manage their IRR [interest rate risk] exposures using processes and systems commensurate with their earnings and capital levels, complexity, business model, risk profile, and scope of operations" (<https://www.occ.gov/news-issuances/bulletins/2010/bulletin-2010-1a.pdf>).

49 See Barr 2023.

50 SVB had 31 open supervisory findings when it failed in March 2023, about triple the number observed at peer firms.

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reliance on evaluations from accounting firms and others. Combined with the very large size of the bank (and its acquirer) relative to the local economy, these constraints left the regulatory authorities in a poor position to effect remediation in a timely manner.

***Remedies include more intense supervision, enhanced internal analysis and challenge, greater disclosure of actions, improved supervisory guidance, and better coordination among agencies.***

Identifying supervisory failures in hindsight is easy, and making supervision effective is always difficult, as the historical experience of many countries shows. With these and other important caveats (including on resources), there are specific useful steps, largely internal to the supervisory agencies, that could be taken in many countries. A first step would be to increase the cadence and tempo of supervision. A shorter time between supervisory reviews, with a more rapid escalation of penalties (for example, at most three months between agreements and public enforcement actions) would help in terms of detection and, importantly, in helping assure follow-up. A second step would be to develop more scope for challenging specific supervisory actions and the related raising of red flags earlier. Many of the vulnerabilities in the recent cases were noticeable using public data, and surely could have been pointed out in systematic reviews by groups within agencies.

Most supervisory agencies already have internal checks and balances processes to challenge supervisory frontline actions (or lack thereof). Such processes could be strengthened to ensure more and earlier actions. With respect to analysis, the issue of commonality in business models and liability structures, typically not systematically considered within most agencies, needs more attention. A third step, and equally important, would be for supervisors to more forcefully warn the supervised institution, including its board. Again, this largely requires basic elements of independent review within the agencies and related follow-up requirements.

A fourth step and an important part of any reform would be to assure that supervisors face both better

incentives to act and stronger accountability. Some incentives are already provided in the form of prompt corrective actions requirements. More could come from the internal reforms noted. But these may not suffice. One additional step would be greater public disclosure of adverse supervisory findings, to increase the pressure on banks to remedy deficiencies faster. Since immediate release can work perversely, by adding to stress, a lag in disclosure would likely be a more appropriate approach. Relatedly, overall statistics on supervisory actions could be released on a regular basis to provide more discipline.

A fifth step to strengthen incentives could be market-based indicators as an (internal) trigger for possible supervisory review, with ex-post reporting on deviations from such rules. Finally, in the specific case of the United States, a key issue would be to improve coordination across supervisory agencies.<sup>51</sup> There are both gaps and overlaps between US supervisory agencies that should be addressed. The quality and incentives of examiners can vary greatly among agencies. In the absence of reform, building in redundancies will be necessary. And, for some central banks, there may at times be conflicts of interest between their financial and supervisory goals and their price stability objective.

Some of the fundamental barriers to making supervision effective will remain, however. While even the official reports have acknowledged the (many) supervisory failures, and remedies are being sought, overcoming the underlying causes will require addressing long-term constraints and involve several complementary steps. Events make clear that the independence, experience, and culture of responsible supervisory agencies greatly matter for actions, maybe more so than formal rules. This is confirmed in cross-jurisdictional evidence (for example, from the International Monetary Fund and World Bank Financial Sector Assessment Programs), where independence and resources, including pay, rank among the highest explanatory variables explaining supervisory effectiveness, and were likely key factors in the CS case. Clearly, since the fiscal, let alone economic, costs of failures typically exceed the (additional) supervisory resources necessary

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51 See Barr 2023.

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to prevent them, from a social cost-benefit perspective, the answer is clear. But since this is a long-standing issue, with many (political economy) constraints, progress will likely be limited.

***Stress tests need to be more comprehensive in coverage of banks and their scenarios.***

Stress testing serves as a de-facto capital (and at times liquidity) requirement in some jurisdictions, including in the United States for the large banks. Stress tests have generally been found to be an effective tool to enhance banking resilience (there are caveats though; for example, stress tests can be reverse engineered by financial institutions). But recent events show that two adjustments are needed to how stress tests are conducted, at least in the United States, for them to remain useful.

First, the size threshold needs to be lowered to \$50 billion to capture more of the banks that can have a systemwide impact if they face stress. This will require significant supervisory resources (although adding back in those large banks that used to be included is presumably not too difficult). Second, the type and severity of scenarios used in the tests need to be more diverse, including both sides of the probability distribution. Notably, the stress tests over the last decade did not foresee any significant interest rate increases.<sup>52</sup> This revamping will call for more than just a change in the interest rate path assumed, and will require revisiting the assumptions about the concurrent economic scenarios.<sup>53</sup> And, of course, scenarios must include severe deposit outflows (liquidity is generally poorly tested, so far).

**D. Prudential regulation.**

***The events showed both strengths and weaknesses in prudential regulations.***

The higher capital and liquidity requirements put in place since the global financial crisis have strengthened the resilience of commercial banks, especially the most systemic ones. But events showed that there remain weaknesses in liquidity rules that need to be addressed, and enhancements

to capital requirements that should be implemented. A weakness in the United States has been the poorly designed proportionality of prudential rules, which are largely based on size (with the tailoring in 2018 making some significant adjustments that further favored midsized banks). Tougher liquidity and capital requirements appear appropriate, but these need to be balanced against the risk that this could lead to some migration of activity to nonbanks. Finally, with stress testing serving in some jurisdictions as a de-facto prudential requirement, and considering experience, stress testing could be made more comprehensive in terms of bank coverage and scenarios (see further above). While these reforms would impose costs on some banks, for most banks that are well run there would be little or no additional cost. Overall, the economic cost should thus be limited and the benefits significant.

***Capital should reflect MTM valuation losses and incorporate a requirement for interest rate risks.***

The core reason for the three US bank failures was their poor asset-liability management and resulting interest rate mismatches. This, in turn, mainly reflected failures of bank management and other stakeholders. But it was not helped by the fact that there were regulatory failures as to how bank capital was determined and how interest rate risk was addressed.

First, the rules allowed for a substantial shortfall between book capital and capital on a mark-to-market (MTM) basis, because some assets did not need to be marked to market when interest rates rose. Besides changes to the accounting rules (see above), the implications of MTM requirements for earnings and capital adequacy need to be addressed. Specifically, any consequences of asset valuation changes need to fully feed through to book capital to clarify the bank's true capital position. There could remain a need for some asymmetry, in that allowing for MTM in a declining interest rate environment could bolster equity book values, which could add to procyclical risk-taking. While liabilities could also be marked to market, as they get repriced too, doing that requires

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<sup>52</sup> Honohan 2023.

<sup>53</sup> Specifically, the "usual" thinking has been that interest rate increases are good for banks, as they come with stronger economic growth, but that is not the case in a stagflation (high interest rate, low growth) scenario.

making difficult assumptions, notably on the degree of deposit stickiness, and risks more procyclicality, and as such should be more limited.

The other related regulatory failure in the United States has been the absence of rules requiring banks to hold capital against interest rate risks. Currently, the Basel standard developed in 2004 on interest rate risks—Interest Rate Risk in the Banking Book (IRRBB)—is not internationally agreed upon.<sup>54</sup> While some jurisdictions, like Canada, the UK, Australia, and the EU, did publish related rules, the United States (which reportedly was among those jurisdictions objecting to the standard) did not adapt formal capital requirements as to IRRBB.<sup>55</sup> This left (and continues to leave) those weakly managed banks with even fewer incentives to properly conduct asset-liability management. To address this in the United States, a properly calibrated capital charge could be applied to interest rate risk exposure. While the Basel IRRBB standard could be revisited, it provides a good starting point.<sup>56</sup> In addition, there could be gross exposure-related capital charges (for example, to cap a bank's gross HTM-exposure).

There is also scope to simplify the capital requirements. The full capital stack<sup>57</sup> is driven by a complex set of rules, with much discretion at the bank and supervisory levels. This complexity and discretion can create ambiguity, notably in times of stress. While the current priority is to assure the Basel III framework is fully and consistently adopted and implemented in all jurisdictions, in due time

the development of a simple capital structure with higher common equity requirements could be preferable.

***Liquidity requirements need to be reviewed, notably as to runoff rates.***

Liquidity rules are a relatively new addition, including to the Basel rulebook, and remain a work in progress. Also, as liquidity shortfalls have a weaker analytical foundation than capital shortfalls, their current designs more likely reflect compromises made among different jurisdictions. The liquidity coverage ratio (LCR) was adopted in 2014 in the United States and came into effect in 2015 (phased in until 2017). Its rules initially applied in full to banks above \$250 billion and in modified form for banks between \$50 billion and \$250 billion.<sup>58</sup> But after 2018, the size threshold was raised, with midsized large banks able to follow a 70 percent or 85 percent of the LCR target, an easing that applied to the three banks that failed. The net stable funding ratio was issued in 2020 and came into effect in July 2021, with its scope recalibrated as well to be consistent with the 2019 tailoring rule (the rules apply in full to Category 1 banks and less onerously for smaller banks).

Analysis using SVB's public financial data<sup>59</sup> concluded that its LCR would have been 75 percent at the end of 2022,<sup>60</sup> substantially below the threshold had the LCR rules of 2014 been in force. Similar shortfalls were likely for the other failed banks. And even that rule appears a low benchmark, as on average G-SIBs keep their LCR close to 125 percent, much above the 100 percent. And outside the United States, LCR threshold (and disclosure) requirements

54 The proposed standard, strengthened in 2016, was never adopted as a Pillar 1 standard. Rather, per the Basel Committee on Banking Supervision Supervisory Review Process 31, "due to the heterogeneous nature of this risk, it is captured in Pillar 2" (see Feldberg 2023a).

55 That said, the US Securities and Exchange Commission does require all publicly listed US banks to disclose their sensitivity to interest rate shocks in annual 10-K filings. As such, for those banks, information was available but evidently was not analyzed sufficiently. And there were supervisory guidance and some regulatory standards issued by the agencies (the Office of the Comptroller of the Currency and the Federal Reserve Board); as noted, however, these left too much discretion to bank management, and some were even revised in 2019 to apply only to banks larger than \$700 billion.

56 Feldberg (2023a) provides specifics on how to formulate such a standard. It would use a standardized economic value of equity measure to calculate the net present value of assets and liabilities. Then, thresholds would be applied to identify outliers—under Basel, the threshold is a modeled impact of interest rate shocks on a bank's economic value of equity that exceeds 15 percent of Tier 1 capital. Then, a requirement to raise capital or take other mitigating actions to address gaps within a specified time frame follows.

57 "The capital stack is typically comprised of four sections in the following order: common equity, preferred equity, mezzanine debt, and senior debt" (<https://www.realtymogul.com/knowledge-center/article/demystifying-capital-stack#:~:text=The%20capital%20stack%20refers%20to,hold%20period%20and%20upon%20sale.>).

58 See RCAP, United States, 2017.

59 Feldberg 2023b.

60 The Barr report (2023) finds 91 percent.



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typically apply to all banks, not just the largest ones, and the global average is even higher, at about 140 percent.<sup>61</sup> Regardless, even if the failed banks were fully compliant with the more stringent LCR, they would not have had the resources to fully meet the large deposit outflows.

Most importantly, the events have shown that the liquidity regulatory framework had major limitations. For one thing, liquidity can and does disappear quickly. The runoff rates assumed in the LCR were clearly too low (notably for noninsured, nonoperational corporate deposits, only 40 percent), and the available liquid assets thus were too limited to provide the banks with sufficient time (30 days) to remedy their weaknesses. Supervisory agencies are reevaluating the stability of bank deposits in general and those that are uninsured. Senior supervisory staff have noted that they contemplate applying tougher liquidity requirements and having the rules apply to more banks.

But at what level to set requirements, especially for the LCR, is not clear.<sup>62</sup> Yes, the assumptions on uninsured deposit outflow rates appear much too low, but the major question in redesigning liquidity rules is what to assume about runoff rates in a world with more speedy runs. Specifically, does available liquidity need to cover normal times or also eventualities in stress times, and over which horizon should it be available—just at the end of 30 days (giving the bank the ability to come up with new funds) or at any time within a 30-day period to allow for interventions? The combination of stress times and rapid runs can clearly point to runoff ratios close to 100 percent for many classes of runnable deposits, and thus much higher LCR requirements.

***Any revision needs to consider the deadweight costs of holding more HQLA and its true liquidity.***

Although analysis will go on for some time, assuming the LCR were to be raised substantially, banks would have to accordingly increase their HQLA holdings. This is

economically costly as it would undermine their intermediation function, that is, they could not lend as much, as they would lack the balance sheet space; could not take on the risks involved; and could not invest in information acquisition, relationships, and risk management to support the lending. In the extreme case, too-high HQLA holdings can make banking less profitable relative to other financial intermediaries (that is, as banks become akin to narrow banks with no scope for lending and very low intermediation margins). And except for central bank reserves, more HQLA would still not fully assure liquidity when needed. When under stress, an individual bank is likely to be reluctant to sell its HQLA as it sends a negative signal (to markets and supervisory agencies). And in times of systemic stress, liquidity in markets for HQLA can be impaired, making it difficult to obtain needed cash. In such cases, the central bank may have to support the market through asset purchase programs, which are much less targeted, less efficient, and have more long-term impacts compared to providing liquidity to banks directly through its LoLR system.<sup>63</sup> Because relying on banks to self-insure for all states of the world has rapidly diminishing returns, LoLR or asset purchase programs are necessary complements.<sup>64</sup>

One way to mitigate against requiring “excessive” holdings of HQLA is to include any assured access to central bank facilities (for example, CLF; see above) in calculating a bank’s liquidity position, including for the LCR. It would avoid some of the socially inefficient HQLA holdings, without undermining the importance of a bank having proper liquidity management. It would also reduce the risk of the market(s) for HQLA being illiquid or otherwise not functioning well at the exact time that a large amount of liquidity would be needed for the banking system. Regardless, any change to the LCR would need to be closely integrated with (improved) standing central bank facilities (see above).

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61 According to Basel Committee on Banking Supervision data.

62 Note that the net stable funding ratio is less debated, in large part as it has not been tested. At the same time, its goal is not to address cases of stress to begin with.

63 This raises the question whether nonreserve HQLA should not be pledged at the LoLR as a matter of course. This would, however, reduce the scope for self-insurance by banks using the financial markets.

64 Hauser (2023) discusses self-insurance compared to public insurance.

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***Standards should differentiate less by bank size and acknowledge more similarity among banks.***

The principle that there can be different standards for certain types of banks is well understood. The current regime puts the principle in practice globally though the G-SIB capital and leverage surcharges for banks that are deemed systemic, and more intense supervisory oversight of larger banks. This has been beneficial as most large banks have been stable following the recent shocks. But the recent turmoil also suggests that the rules may be too lenient for smaller banks.

The relaxation of standards for midsize banks in the United States has clearly come into question and will likely be reversed. The benefits of more stringently regulating smaller-sized banks or banks with specific business models may also outweigh the costs. Midsized banks can create systemic distress, as events showed, which would justify higher capital, liquidity, and other prudential requirements. For example, the FDIC chairman has proposed requiring that banks with as little as \$100 billion in assets issue long-term debt to cover capital losses if they were to fail.

More generally, recent events (and others before) suggest that what makes a bank systemic and a candidate for tougher standards is not just size. Banks do not have to be large to be systemic if there are many look-alikes. Similarity in terms of business models and common exposures to one asset class among a broader group of banks are sufficient for contagion and systemic risk. So far, there is no acknowledgment in the formal rules, either as part of the Basel framework or in other microprudential rules, that similarity matters.<sup>65</sup> This more macroprudential perspective, missing in many jurisdictions, is of course not easy to implement.<sup>66</sup> But adjustments can be made in supervision, where discretion exists for the supervisor to add requirements (so-called Pillar 2).

***An overall assessment of prudential requirements is called for, also considering structural changes.***

Raising capital, liquidity, and other requirements calls for a cost-benefit analysis, which is challenging. There are multiple potential benefits of tougher standards, including in terms of reducing the probability of runs, failures, or both. Academic and policy evidence is fairly conclusive on the microprudential benefits, including relative to costs: banks with higher capital fail less, yet do not seem to lend less and are, in general, also more profitable.<sup>67</sup> Evidence is weaker on how capital adequacy (and liquidity) requirements affect banks, but some does suggest that there are adjustment costs in that raising requirements can lead banks to reduce their lending in the short run.<sup>68</sup>

There are obvious limits to higher requirements and trade-offs with using other measures. Too-high capital and other standards can make banks less competitive, either driving business to marginally less well-supervised banks or to big banks that, despite the many regulatory and supervisory reforms since the global financial crisis, still seem to benefit from a too-big-to-fail subsidy.<sup>69</sup> Both call for regulatory and supervisory responses. And higher requirements can mean that activities move outside of the regulated banking perimeter, which will necessitate regulatory and supervisory actions outside the banking perimeter. Absent proper nonbank regulation and supervision, banking requirements will have to internalize some of the consequences of this spillover for overall stability.

A related, broader question is whether the intrinsic profitability of banking has declined. The drivers of changes in bank profitability are long-standing: technological changes and greater competition among banks and from nonbanks (for example, money market funds, but also fintech and big tech). While the surge in interest rates has been beneficial to their net interest margin for most banks, as many analysts expected, the rise in interest rates

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65 Although the formulas for setting the G-SIB and D-SIB surcharges do include factors other than size (for example, uniqueness of services provided), no factor tries to capture the similarity in terms of business models among a broader group of banks.

66 This approach would amount to a macroprudential approach to capital adequacy requirements, for which the design and implementation of an analytical and policy framework is generally acknowledged to be challenging.

67 For example, see Boissay et al. 2019 for a review.

68 For example, Eickmeier, Kolb, and Prieto 2023.

69 On the evidence of the effectiveness of the too-big-to-fail reforms, see FSB (2021).

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may have accelerated the migration of liabilities to nonbanks, notably in the United States. Consequently, the assumptions on banks' deposit franchise value—low cost and stable sources of funding—may be less well founded. Higher deposit betas and more use of wholesale funding could change funding costs in fundamental ways.<sup>70</sup>

As competition by nonbanks for extending credit services is also strong, this could result in persistent pressure on net interest margins. This would lower banks' profitability and could erode the viability of some banks. The

impact of these trends is likely to vary across banks; for example, money center banks<sup>71</sup> may suffer less compared to smaller regional banks, and across jurisdictions. For example, the European banking system is likely more exposed than the US banking system, given its larger reliance on deposit funding, in addition to its more limited noninterest income and structurally lower profitability. These issues have consequences for the proposed financial reforms (as well as for monetary policy transmission and macroeconomic outcomes).

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<sup>70</sup> See Drechsler, Savov, and Schnabl 2023b.

<sup>71</sup> "A money center bank is similar in structure to a standard bank; however, it's borrowing, and lending activities are with governments, large corporations, and regular banks." Examples in the United States are Bank of America, Citi, JP Morgan, and Wells Fargo (<https://www.investopedia.com/terms/m/money-center-banks.asp#:~:text=Key%20Takeaways-,A%20money%20center%20bank%20is%20similar%20in%20structure%20to%20a,and%20Wells%20Fargo%2C%20among%20others.>).

# IV. IMPORTANT INTERACTIONS BETWEEN REFORMS AND OVERALL RECOMMENDATIONS

While reforms are needed in many individual areas, the main challenge, as noted, is to develop a coherent overall package. Not all reforms are equally important or doable. There are important complementarities and substitutions among reforms to consider. Furthermore, consideration must be given to how much to rely on the private versus public sector for insurance against liquidity and other shocks. The effects of reforms on the whole financial system also need to be considered. This section reviews the most important interactions and discusses what they imply for the mix.

## *Lender of last resort, liquidity and capital regulation, and deposit insurance interact.*

Reforming the LoLR system to require 100 percent pre-positioning of collateral (using, of course, haircuts) for all runnable liabilities is the key reform proposed, but it too needs to be complemented by several other reforms.

One consideration is more appropriate prudential requirements. In stress times, the LCR is largely irrelevant as the bank will presumably be forced to use the LoLR facilities, and runnable liabilities are fully covered.<sup>72</sup> The LCR and the related HQLA requirements remain relevant for a bank's liquidity management in normal times.

In terms of its liability structure, the bank will need to be able to cover all runnable liabilities with collateral after haircuts. For some banks, depending on their asset and liability mixes and how risk weights vary from haircuts, the net amount that could be available may be less than their runnable liabilities.<sup>73</sup> But this would create the proper incentives to better manage their funding risks.

Deposit insurance reform obviously needs to be integrated with the LoLR reform. With higher insurance limits and thus greater coverage of liabilities, less pre-positioned LoLR is needed (as the definition of runnable liabilities would exclude insured deposits). At the same time, a higher insurance limit would necessitate greater supervisory oversight and possibly higher capital and liquidity requirements because it would encourage greater risk-taking. And, to truly prevent runs, the insurance system needs to function smoothly so that depositors have no risk of time delay in access to their funds (examples suggest that even small delays can cause insured depositors to run).

## *Capital and liquidity requirements interface with stress tests used as a prudential tool.*

There will be a familiar tradeoff between capital and liquidity regulation: with more capital, less liquidity is

72 For those banks that fund themselves fully with insured deposits, for which a (low) runoff will still apply, the LCR will be positive, and they will need to have adequate amounts of HQLA or CLF and pre-positioned LoLR.

73 The haircut regimes used in the pre-positioning of collateral are not a substitute for capital regulation. LoLR haircuts should reflect (tail-risk) credit losses to the central bank, not market liquidity risks. Capital regulation, which is more complicated, reflects not just market risk (which includes liquidity risk), but also (asset) credit, operational risk, and the more general complexity of banking. In most cases, at the individual asset level, haircuts and risk weights will thus vary. Nevertheless, it is possible that haircuts rather than risk weights might become the binding constraint, at times.

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likely required. Conversely, if a bank has stable funding, it does not need as much capital. Currently, however, there is no adjustment to liquidity requirements depending on capital in place or, vice-versa, to capital required depending on funding stability.<sup>74</sup> As noted, the pre-positioning proposal already implies some link between capital and liquidity requirements. One other way to have capital and liquidity regulations integrated would be to include a graduated reduction in the LCR (and net stable funding ratio [NSFR]) for those banks meeting much higher capital requirements, or, conversely, a graduated increase in formal capital requirements for those banks with less stable funding (for example, low LCR [and NSFR], less pre-positioned LoLR). The appropriate calibration of such trade-offs though is unclear, and likely to vary by type of bank and the overall macroeconomic and financial environment, including the likely speed of deposit withdrawals.

An alternative would incorporate both capital and liquidity in stress tests. Stress tests have so far largely been used to identify banks' solvency resilience. One lesson of recent events is that stress tests should have scenarios that involve liquidity shocks. Stress tests could, for example, examine what happens to a bank's capital when deposit betas are significantly higher than anticipated and banks suffer significant deposit outflows.

***Reforms will affect not only the role of banks, but also overall financial intermediation.***

A broader LoLR than proposed here could have significant implications for financial intermediation. For example, the pawnbroker for all seasons (PFAS) would have very significant impacts, particularly if it is applied to both banks and non-banks.<sup>75</sup> The PFAS's coverage of

all liabilities would force banks to adjust the structure of their assets and liabilities more, depending on the haircuts in place, and thus potentially limit banks' ability to provide some intermediation services. Relatedly, the wide coverage could make the haircuts the de-facto standard in setting the pricing of many assets in the economy, and could amount to a form of general resource allocation.<sup>76</sup> (Of course, the PFAS would at the same time do away with the need for deposit insurance.)

For this reason, this report proposes that the scope of runnable liabilities should be limited (that is, deposit insurance should be retained and insured deposits exempted) and should not include liabilities that cannot run in the short term, like long-term debt. A key part of the proposal is the enhancement of the institutional infrastructure to encourage banks and the central bank to improve their systems and rules to facilitate a wide pool of assets that can be used as collateral with a robust haircut regime and that minimizes frictions during times of stress.

It is also important to consider the potential for risk migration and other spillovers to nonbanks. Reforms should not just foster the efficiency and stability of individual banks and the banking system, but that of the financial system, more generally. Intermediation outside banks has exceeded that of the banking system for some time now in many jurisdictions. This has come with new risks, as seen in the turmoil in financial markets in March 2020.

The tighter regulation and supervision of banks after the global financial crisis has been cited as one factor encouraging the growth of nonbank financial intermediation. The more tightly banks are regulated, the more activity will migrate into the unregulated financial sector.

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74 As noted, the pre-positioned LoLR haircuts are corrections for tail credit risks of the asset and thus can exceed the risk weights for the same assets used in the capital requirements, even though they do not correct for liquidity risks.

75 The extension of any official liquidity support to nonbanks is not analyzed here, as it would require reviewing the efficiency of asset purchase programs and the regulatory regime for nonbanks.

76 For example, if the haircut on mortgage-backed securities is set low and becomes the cyclical binding constraint, it could encourage too much housing finance. More generally, the use and setting of margins on so many claims may be less robust, institutionally and from a political economy point of view. Risks can include the emergence of zombie banks and zombie firms. And assets used as collateral on a large scale could become "too big to fail." In extreme cases, this even applies to government debt; for example, it creates bank-sovereign links with associated risks of a bank doom loop.

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This could potentially make the overall financial system less safe, even as the shrunken banking part becomes safer.

***Events call for a review of siloed policymaking and the separation principle.***

Events in the United States and Switzerland illustrate that a range of policies were not well coordinated across their full domain. The stress tests in neither the United States nor Europe incorporated a wide range of monetary policy paths (including the actual path). For the past decade, the stress tests in the United States only envisioned a period of low-for-longer interest rates. Relatedly, the monetary policy decisions prior to 2021 (low for long and quantitative easing) did not consider how these choices encouraged the buildup of vulnerabilities. The subsequent interest rate shock was large and unexpected in terms of its speed and magnitude.

By viewing monetary policy as separate from financial stability, bank safety, and soundness, there was too much pressure placed on the presence and quality of supervision and the effectiveness of (macro)prudential policies. The first clearly failed, and relying on the latter

was perhaps always wishful thinking, it being new and untested. Addressing this siloed policymaking calls for greater integration of monetary policy, financial stability, and prudential supervision decision-making, but is easier said than done. It will mean changes to decision-making, internal to the central bank and (supervisory) agencies, as well as to their external governance, which are not evaluated here.

One related issue to review is whether the central bank—given its other responsibilities—is best placed to conduct banking supervision. On the one hand, the health of the banking system is essential to financial stability and thus to the efficacy of monetary policy. This means the central bank needs to understand how the financial system functions, even without having a financial stability mandate. On the other hand, there is a risk that supervision is second class to monetary policy. Perhaps better governance models could help address these tensions (for example, one could have separate committees, like the Bank of England does). So far, the (ongoing) official reviews for the United States are defined too narrowly in scope to address this important issue.<sup>77</sup>

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<sup>77</sup> For example, the Barr Report (2023) makes no mention of monetary policy as a factor in leading to the buildup of vulnerabilities.

# V. CONCLUDING OBSERVATIONS ON ACTIONS NEEDED

The proposals made here have implications for various agents, with different timetables for actions.

*Central banks*, especially those with LoLR systems that are difficult to use or restricted, need to start with updating and improving their collateral management policies and systems. This will require significant investments, over a multiyear period, and the time to start is now. These actions should be backed up with policy statements that there is no reason for banks not to use LoLR when liquidity needs are high. In their monetary policy roles, central banks must give closer consideration to their financial stability effects, both during periods of low interest rates and quantitative easing, and when tightening is necessary.

For *supervisory agencies*, many recommendations can be acted on quickly and without legislative changes. These actions include more intense supervision and more comprehensive stress tests, notably of midsized banks, and better internal challenge functions and greater disclosure of supervisory actions. Guidance on bank internal risk

management, notably as to interest rate risk, and on banks' preparations for potential LoLR use should be updated and issued as soon as possible. Other changes, including assuring sufficient resources, will take more time.

*Internal and external governance* needs to be enhanced, notably as to risk management functions, including the Chief Risk Officer reporting to the board, for which supervisory actions are most impactful in the short term. *Accounting rules* should be revised quickly to leave less discretion to bank management on whether to recognize losses on securities held on the banking books. Bank regulations should force banks to immediately recognize such losses in their capital positions, without any filter. There remains a crucial role for security and other regulatory agencies to assure proper disclosures. Other *prudential regulations* will need to be revised, for which analysis and (domestic and international) consultations will take some time. These include the interaction between capital and liquidity requirements and a reformed LoLR system, which deserve special attention.

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