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Ignazio Angeloni, Stijn Claessens, Amit Seru,
Sascha Steffen and Beatrice Weder di Mauro

# MUCH MONEY, LITTLE CAPITAL, AND FEW REFORMS

## THE 2023 BANKING TURMOIL

ICMB INTERNATIONAL CENTER
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**Beatrice Weder di Mauro** currently serves as the President of the Centre for Economic Policy Research (CEPR) and is the André Hoffmann Chair of Economics, Climate, and Nature Finance at the Geneva Graduate Institute. She is also a Distinguished Fellow at INSEAD. Her academic journey includes her role as a Research Professor at INSEAD Singapore and a Professorship at the Gutenberg University of Mainz in Germany. From 2004 to 2012, Beatrice was a member of the German Council of Economic Experts, where she contributed significantly to shaping economic policy in Germany. Her influence extends beyond academia into the corporate world: she has served as an independent director on the boards of several leading global companies and is currently on the boards of Unigestion and Bosch. In addition to her corporate roles, Beatrice is frequently called upon to provide expert advice to governments, international organizations, and central banks. Her areas of research include macroeconomics, financial crises, and the emerging fields of climate and nature finance.

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# Foreword



The Geneva Reports on the World Economy are published annually by CEPR and ICMB and have been providing innovative analysis on important topical issues facing the global economy since 1999.

In March 2023, over the course of five days, three small to mid-sized US banks collapsed, causing a sharp decline in global bank stocks and prompting rapid central bank interventions to prevent a potential global crisis. At the same time, Credit Suisse, a major bank in Switzerland with global importance, also failed, revealing comparable systemic weaknesses. These events required significant public interventions to stabilise the banking sector and raised questions about the effectiveness of reforms implemented after the 2008 financial crisis.

The 27th Geneva Report examines the March 2023 banking turmoil, highlighting the continued fragility of banking systems despite post-global financial crisis reforms. The report identifies structural weaknesses, including poor risk management, inadequate supervision, and incomplete regulatory frameworks.

Structural issues that remain unresolved include fragmented supervision in the United States, which allows banks to 'forum shop' for lenient oversight, and the incomplete European Banking Union, particularly regarding deposit insurance. The report also points out the higher risk of fast bank runs due to digitalisation and social media.

Globally, the frameworks for managing recovery and resolution of large banks are still inadequate, with slow and limited responses to banking crises. The report emphasises the need for comprehensive reforms to address both longstanding vulnerabilities and newly emerging risks, including better integration of monetary policy and financial stability, improved supervision, and stronger recovery and resolution mechanisms.

In the United States, the report highlights the ongoing funding fragilities among banks, which could lead to further solvency crises if not addressed. It advocates for structural reforms, including the rationalisation of supervisory agencies and the improvement of accounting rules to better reflect banks' financial positions. In Europe, despite progress, the report notes that the banking system remains overbanked and inefficient, with a need for more cross-border mergers and acquisitions within the euro area.

The report concludes that while past reforms have helped, more are needed to ensure financial stability in a rapidly changing economic environment, with a focus on preventing future crises through better regulation, supervision, and coordination of monetary and financial stability policies.

This report was produced following the Geneva Conference on the World Economy held in May 2024. CEPR and ICMB are very grateful to the authors and several discussants for their efforts in preparing material for this report, as well as to the conference attendees for their insightful comments. We also thank Laurence Procter for her continued efficient organisation of the Geneva conference series, Antoine Cornevin for recording and summarising the discussions, and Anil Shamdasani for his excellent handling of its production.

CEPR, which takes no institutional positions on economic policy matters, is delighted to provide a platform for an exchange of views on this important topic.

Tessa Ogden
Chief Executive Officer, CEPR

Ugo Panizza
Director, ICMB

August 2024

# CHAPTER 1

# Introduction



The events of March 2023 in the United States and Switzerland showed, once again, that banking systems remain fragile. Events included the failures of three US banks – Silicon Valley Bank (SVB), Signature Bank, and First Republic Bank – that together came to close to being the largest failure in US history, and the dramatic failure of Credit Suisse, a global systemically important bank (G-SIB) in Switzerland. In spite of much progress, the post-global financial crisis (GFC) reforms remain incomplete, with the need for large-scale public interventions to stabilise the two banking systems proof of this. In part, this incompleteness reflects delays in implementation: in major jurisdictions, notably the United States and Europe (here defined as the European Union, Switzerland and the United Kingdom), Basel III still needs to be finalised and then fully implemented. Policymakers globally should adhere to their own commitments: "Full, timely and consistent implementation of Basel III is fundamental to a sound and properly functioning banking system that is able to support economic recovery and growth on a sustainable basis."[1] Furthermore, in many jurisdictions, in spite of much effort, questions remain about the credibility of the recovery and resolution regimes for G-SIBs, and whether bailouts and other official supported solutions remain necessary sins.

The events also reflect gaps in the post-GFC reforms, old lessons forgotten, and evolving risks. The failure of the three US banks is most often largely attributed to their poor risk management and weak regulatory oversight. But the central bank's expansionary policies, in the form of low interest rates and quantitative easing (QE), in place for most of the post-GFC period, followed by a very large monetary expansion – and much fiscal support – during the pandemic led to a liquidity dependence at many banks which came back to haunt them. Besides the three failed banks, many other US mid-sized and regional banks, as well as some European banks, had also seen their (uninsured) demand deposits of households and corporations grow rapidly and maturity mismatches balloon. Absent rules for interest rate risk management, a major reform gap in the US, and given the weak supervision of some banks, this vulnerability went largely uncorrected. In early 2023, following major interest rate hikes and some quantitative tightening (QT), investors caught on to this vulnerability and the riskiest banks quickly encountered liquidity withdrawals. This promptly led to solvency problems, in part as (official) liquidity support – such as from the lender of last resort (LOLR) – was neither sufficient nor made available

1 "Governors and Heads of Supervision (GHOS) reiterate commitment to Basel III implementation and provide update on cryptoasset standard", press release, 13 May 2024 (www.bis.org/press/p240513a.htm).

quickly enough. Many other US banks experienced large withdrawals of deposits at the same time and some faced runs, making for a possible systemic event. The Credit Suisse case also showed deficiencies in LOLR mechanisms. Furthermore, the events showed weaknesses, to varying degrees, in accounting frameworks and the coverage and design of deposit insurance schemes. Lastly, compared to earlier periods, an issue common to many systems was the much higher risk of very fast runs due to the high level of digitalisation in finance and the rapid spread of information through social media.

Besides completing the reforms put in motion more than 15 years ago and addressing newly emerging risks, several structural issues remain to be addressed in the United States, Europe and globally. In the United States, supervision remains very fragmented. This has led to chartering banks being able to forum shop for more lenient agencies and to major differences in the quality and intensity of oversight of individual banks. This supervisory fragmentation, which saw limited improvement after the GFC (at the time, only one supervisory agency was eliminated), in combination with a regulatory system allowing for weaker rules (in recent years often for smaller banks), clearly contributed to the failures. Besides weak overall, as well as sluggish, oversight and the related higher system-wide risk, the fragmentation means many inefficiencies more generally, including due to banks having to interact with multiple agencies.

In Europe, there has been much progress in strengthening regulation and supervision of the larger banks since the adoption in 2012 of the Single Supervisory Mechanism (SSM). But overall the system, with its mix of national and supranational agencies and national members and the need for majority decision-making in the SSM and Single Resolution Board (SRB), remains unwieldly. Furthermore, as was found to be the case in the United States, supervision has been too compliance-oriented, with scope for improving the qualitative assessment of risks and for streamlining processes (Dahlgren et al., 2023). Importantly, the Banking Union initiated in 2012 remains incomplete as deposit insurance remains nation-based and the crisis management toolkit needs further strengthening. Relatedly, the structure of European banking has not seen major change over the last decade and is still largely nation-focused. This makes for a system that shares risks poorly, ends up being less competitive, and does not serve consumers and firms well, especially those with high growth potential.

Globally, deficiencies in the frameworks for managing recovery and resolution remain large, especially for G-SIBs, as shown in the first test case. In cases of going concern weaknesses, the process for recovery from weaknesses is poor and the options available for recovery are too limited. Most importantly, incentives to act early are low, obviously for bank management but also among supervisory agencies, making for actions that are 'too little, too late'. In gone concern cases, the options considered remain too limited, with resolution through open bank bail-in remaining an untested principle (though Credit Suisse came very close). In both recovery and resolution, subsidiarisation and

prepositioning trap capital and liquidity, preventing it from being up-streamed and transferred across borders. Other flaws include legal uncertainties about bail-in bond conversion, the lack of assured funding in resolution, and the use of Additional Tier 1 bonds (AT1s) as a gone concern rather than a going concern recapitalisation instrument.

Amid these incomplete reforms and new risks, vulnerabilities that have plagued banking systems before remain significant. Commercial real estate exposures, often concentrated among some types of banks, concern both the US and European banking system. Reforms to date fall short in dealing with a rapidly changing financial landscape with newly arising interactions between banks and non-banks, where risks among non-banks can spill back to banks and the broader financial system. As in years past, central banks may once again have to act as 'market-makers of last resort' to address dysfunction in key financial markets. Finally, a slowing global economy, climate change – and related policy adjustments to mitigate and adapt to its effects, possibly rapid – and rising geopolitical tensions present risks to banking systems globally.

Cognizant of ongoing reforms and current conditions, this report analyses these issues. It assesses, explicitly and implicitly, whether the post-GFC reforms are sufficient to deal with the rapidly changing economic environment, including those related to the conduct of monetary policy and the ongoing structural changes in banking systems, and what additional reforms may be necessary. The report complements other recent analyses such as the 2023 report from NYU Stern (Acharya et al., 2023d), the 2024 report from the Group of Thirty and the sixth report in The Future of Banking series (Acharya et al., 2024). It focuses relatively more the implications of longer-term trends and structural changes for financial stability and regulatory system design. Rather than focusing on the proximate causes, it diagnoses the effects of the changes in the overall economic and financial environments in which banks operate and the deeper, underlying weaknesses in institutional frameworks. Furthermore, instead of analysing reforms piecemeal, it tries to consider the issues and reforms holistically, including those concerning the interactions between monetary and financial stability policies and actions. While the report concentrates on the United States and Europe, its lessons apply more generally.

For the United States, funding fragilities remain the number one vulnerability. The report documents the still significant funding weaknesses among many banks, with considerable interest rate mismatches combining with large valuation losses and additionally, for some banks, significant commercial real estate exposures. As shown last March, such fragilities can trigger solvency runs that do not resolve based on temporary liquidity injections. Furthermore, as the report notes, several institutional deficiencies in the United States prevail. Unfortunately, Basel III remains far from fully implemented, with little apparent justification. More specifically, official sector responses to the risky funding structures and the very speedy liquidity withdrawals have been limited so far. The risks of runs and related broader contagion thus remain high, making a recurrence of events like those in March 2023 possible. To address this, the report suggests a 'market test' by requiring banks with capital shortfalls to promptly raise new equity. If banks are

judged to be unable to raise capital right away, regulators would instead perform a stress test to clarify their capital adequacies. The report's analysis using public data already identifies a tail of weak banks for which equity of between $190 to $400 billion would suffice to prevent runs. Going forward, to improve incentives, it advocates the adoption of rules for interest rate risks and a related capital charge. The aim of these reforms would be for the maturity of assets held on a bank's balance sheet – and, relatedly, the ability to record some assets at their book value – to match closely (considering hedging) that of the bank's liabilities. The final goal is to ensure that the bank remains a going concern under any future interest rate scenario, obviously considering the stickiness of deposits and the risk of runs.

As a structural reform, the report highlights the urgent need to rationalise the various US supervisory agencies (federal, state) to increase the effectiveness of their supervision. It concurs with other recommendations to change accounting rules and to remove much of bank management's discretion in how to treat assets for mark-to-market purposes. The final goal should be to make financial reports, and disclosures more generally, better reflect banks' true income and capital positions, notably with regards to the recognition of (interest rate-related) valuation losses for smaller and mid-sized banks. The report concurs with others on the urgent need to improve the operations of the US LOLR regime in a world of near instantaneous runs. Additionally, a requirement for banks to preposition collateral at the central bank to cover their runnable liabilities would allow more time for the restructuring (including resolution) of weak (insolvent) and illiquid banks, limit contagion across banks, and incentivise improvements to banks' liquidity risk management. Conducting liquidity-based stress tests should furthermore be a routine supervisory tool not just in the United States, but also in other jurisdictions.

The report shows that, in Europe, bank capitalisation and liquidity had increased greatly prior to the events of March 2023, thanks in large part to improved regulation, centralised supervision and greater oversight of national supervisory agencies by the European Union. But vulnerabilities continue to be significant, and despite recent improvements in profitability, the valuations of many European banks remain well below those of comparable banks in the United States. Notably, most of Europe's large systemic banks trade at price-to-book ratios below one. The low bank valuations suggest, besides some risks, limited franchises – due to current market structures and/or the threat from competitors within and outside the banking sector – and less-than-efficient operations. Indeed, with its still numerous bricks-and-mortar branches, ample staff, and large balance sheets, Europe appears overbanked. Furthermore, significant swaths of European banks, being public sector-owned and/or weakly governed, do not face full market discipline. The recently higher bank profitability, however, provides a window for moving to more viable business models and market structures. This should include a step up in cross-border M&As, notably within the euro area. Facilitating this requires,

additionally to completing the Banking Union, specific modalities. For this, the report proposes a new EU-wide bank charter with no intra-euro limits on the movement of capital and liquidity for banks with the structure, organisation and ambition to engage in cross-border banking and committed to supporting all their entities in case of stress.

To help preserve financial stability globally, the report draws attention to the need for a better integration of monetary policy and financial stability. The events of 2023 revealed again that monetary policy matters for financial stability, with the vulnerabilities due to the expansionary policies emerging and triggering stress on banks' liability side this time. Policy recommendations include improving the analyses, staffing and processes at central banks and supervisory agencies; conducting more systematic assessments of the financial stability implications of both conventional and unconventional monetary policies; using a wider set of interest rate scenarios in stress tests; and adjusting the pace of quantitative tightening in light of its effects on financial stability. These and other changes will help avoid the build-up of vulnerabilities and reduce the occurrence of stress when economic circumstances change.

As to the regime for large bank recovery and resolution, the report proposes various enhancements aimed at reducing the reliance on government support in cases of stress or failure. It calls for a workable recovery regime that triggers supervisory actions early, provides supervisors with sufficient powers and instruments to allow them to make a weak bank sound in a short period of time, and mitigates the risk of runs and their consequences if they do occur. To enhance resolution, it calls for more and earlier use of contingent debt conversion for banks as going concern, greater ease in moving liquidity and capital intra-groups, sufficient public liquidity backstops to facilitate resolution, and more options for resolution including open bank bail-ins. Other related reforms suggested include improvements to the markets for contingent equity claims.

The report is organised as follows. Chapter 2 reviews the recent events, the status of the post-GFC reforms, and the conditions of the US and European banking systems prior to the stress events. Chapter 3 analyses the underlying weaknesses in the two systems, focusing on funding risks and their links with monetary policy. Chapter 4 reviews what is amiss in terms of banking integration in the euro area, the structure of US supervisory agencies, recovery and resolution, and financial stability and monetary policy coordination. Finally, Chapter 5 briefly summarises the report's diagnosis, making clear that the reforms to date have helped but that more are needed, with old lessons confirmed and new ones emerging. It then provides the report's main recommendations, notes other complementary reforms, and describes what may occur if policymakers do not act.

# CHAPTER 2

# The March 2023 events, reforms to date, and current conditions



This chapter sets the stage for the subsequent in-depth analysis and related policy recommendations. It briefly reviews what happened in March 2023, takes stock of the status of the post-GFC reforms, both globally and in the United States and Europe specifically, and describes the financial conditions and market assessments of US and European banks prior to the events of March 2023.

## 2.1 EVENTS LAST MARCH IN THE UNITED STATES AND SWITZERLAND

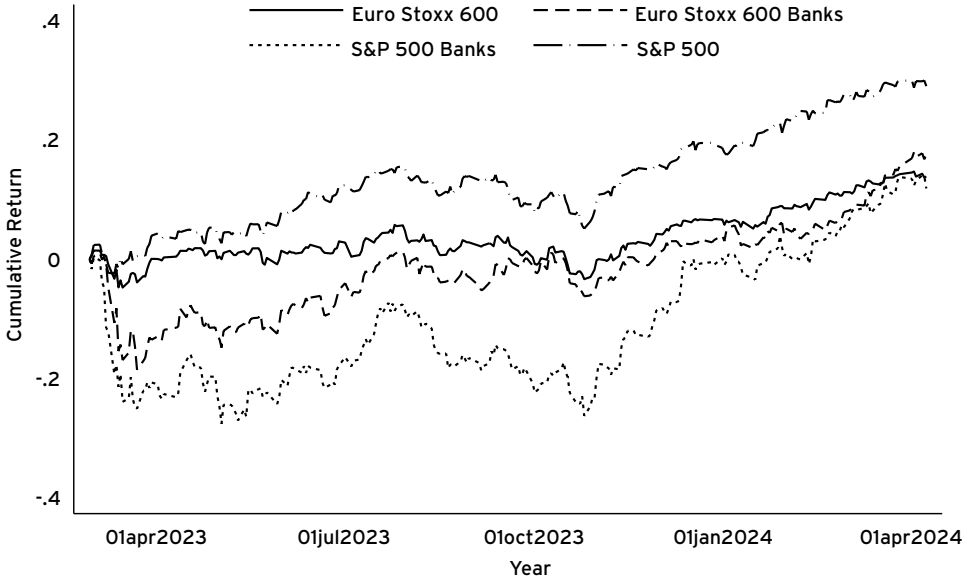
The banking events in March 2023 are well-known and many reports (e.g., Acharya et al., 2023d; Expert Group on Banking Stability, 2023; Group of 30, 2024; Metrick, 2024; Acharya et al., 2024) and official statements (e.g., Barr, 2023; BCBS, 2023; FSB, 2023a; FINMA, 2024; SNB, 2023, 2024; Federal Department of Finance, 2024) have already reviewed their causes and consequences. Therefore, this section just notes (in Box 2.1) key aspects of what preceded and followed the events that are of relevance to the rest of the report. Chapter 3 analyses in greater detail the specific weaknesses that led to the turmoil and provides related insights for policy.

The events in the United States and Europe had several common causes, an important one of which was a rapidly changing macroeconomic environment. Both also led to general financial uncertainty and risks of economic spillovers, which necessitated the large-scale public interventions. As such, and also to further set the stage, it is worth reviewing the market reactions around the times of the bank failures and subsequently.[2] Figure 2.1 shows for the United States the changes in the S&P 500 banks index and S&P 500 general stock index, and for Europe the changes in the Euro Stoxx 600 bank index and Euro Stoxx 600 broad index, all from 1 March 2023 to 10 April 2024. In the United States, bank stocks plunged more than 25%, a drop which lasted until late-2023. As the broad index initially saw just a small decline and then a sharp recovery, a year after the events there remained a large cumulative return gap between banks and the overall stock market. The European banking sector saw a marked decline of almost 20%, but then fully recovered in mid-2023. The broader European stock market did not react much to the bank failures in either jurisdiction, and a year after the events, the recovery in European banks stock

2 Chapter 3 investigates in more detail the determinants of the stock price performance of US and European banks and the cross-sectional differences in market valuations during March 2023 and over longer periods.

even exceeded the increase in the broad market. The longer-term economic spillovers in both jurisdictions appear limited, at least judging by stock market performance, as the overall indexes rose significantly over the 12 months, especially in the United States, and economic performance was good, at least in the United States.[3]

FIGURE 2.1 **STOCK PRICES IN US AND EUROPE, 1 MARCH 2023 TO 10 APRIL 2024**




### BOX 2.1 **EVENTS IN MARCH 2023**

This box briefly describes the events and associated key regulatory, supervisory, and policy actions.

In the United States, there were runs on three banks (SVB, Signature Bank and First Republic Bank).[4] As in most other analyses, the causes of the runs and subsequent failures can be attributed to a combination of a rapidly shifting macroeconomic environment, individual banks' poor business models (particularly weak risk management), and poor supervisory oversight and action. The low interest rates and ample liquidity before 2021 in the United States had aided these three banks, and others, to adopt risky funding structures, with large shares of uninsured deposits (often also very concentrated), and to accumulate low interest-yielding, fixed-income assets.

3 We also looked at the secondary loan market using the Morningstar LSTA US and European Leverage Loan Index. Both indices remained largely unaffected.

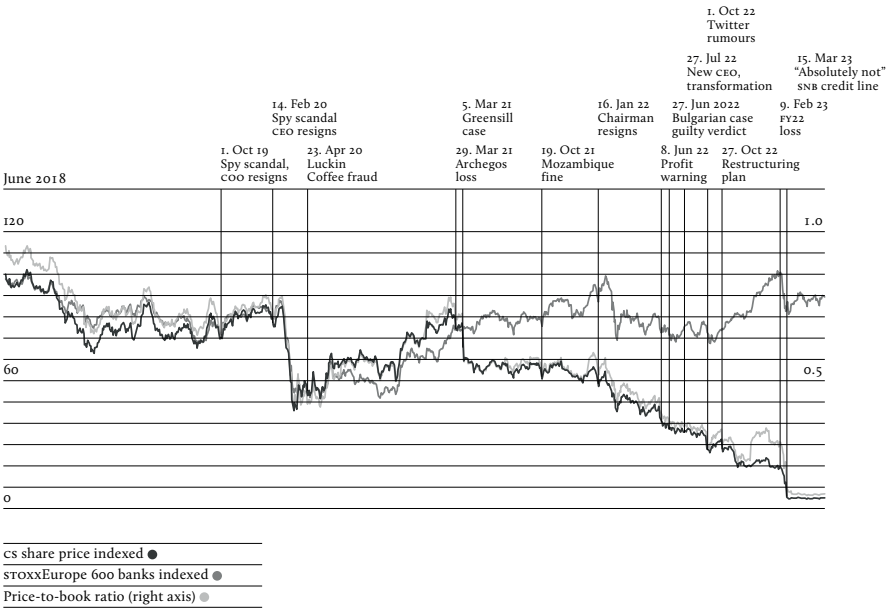
4 The case of Silvergate Bank, which announced on 8 March 2023, that it would wind up, differs from the other three banks in two main respects: it did not have large maturity mismatches, rather, it suffered losses on its assets due to the crypto winter; and it wound itself up, without any government intervention or losses for its depositors.

BOX 2.1 **(CONTD.)**

The rise of interest rates and funding costs after mid-2022 led to large (unrealised) losses on securities holding and declining profit margins in core businesses. As confidence evaporated – connected to a combination of banks' announcements of valuation losses, related (failed) attempts to raise new capital, and more generally questions about their franchise values – liquidity runs started. As funding disappeared or was repriced and assets had to be sold at a loss or valued lower, these banks quickly became insolvent given their large mismatches. This necessitated interventions on the weekend of 11-12 March. Although bank failures are not unique or something new in the United States, the three banks had grown fast to rank among the top 30 US banks by assets at end-2022, and their failures represented three of the four largest failures of federally insured banks ever. A major surprise was how important social media was as a contagion channel and how rapidly the individual failures threatened to lead to runs at other – both similar and less similar – banks (Cipriani et al., 2024) and thereby undermine overall financial stability.

As the events in the United States evolved, Switzerland became the epicentre of the turmoil in Europe with the demise of Credit Suisse, a global systemically important bank. Management deficiencies had caused the bank's profitability to deteriorate and its equity and credit market valuations to progressively decline over a decade, but not out of line with with other European banks (see Figure 2.2).

FIGURE 2.2 **EUROPEAN BANK AND CREDIT SUISSE STOCK PRICE INDEXES (LHS) AND CREDIT SUISSE PRICE-TO-BOOK RATIO (RHS)**



BOX 2.1 **(CONTD.)**

Several high-profile losses in the three years before its demise (e.g., Archegos Capital Management, Greensill Capital) and high ongoing legal costs were symptomatic of Credit Suisse's poor management. While its financial ratios remained satisfactory (and continued to meet local regulatory standards to the end), markets increasingly doubted its long-term viability. This was especially the case after a new strategy announced in the autumn of 2022 was poorly received and social media rumours had led to a run by wealthy clients, mostly in Asia. At that stage, internal liquidity buffers were still sufficient and deposits soon stabilised. However, in March 2023, following a large investor indicating that it would no longer participate in any new equity offering and with the generalised uncertainty after the failure of SVB, mistrust in Credit Suisse led to a severe run, this time including Swiss retail investors. By 17 March, the bank was on the brink and cut off from all markets, and on Sunday 19 March the Swiss authorities orchestrated an emergency merger with UBS.

The broader fallout from these (potential) failures motivated large-scale and unprecedented public interventions in both the United States and Switzerland, with the common objective of halting contagion among banks and restoring confidence in the overall financial system. The US authorities invoked the systemic exception to allow for a full guarantee of all (uninsured) deposits at the two banks intervened first (SVB and Signature Bank). They also signalled that they would be willing to do so at other banks that may come under stress, providing a de facto guarantee to those depositors threatening to run. In Switzerland, to facilitate the takeover of Credit Suisse by UBS, a local G-SIB, authorities provided large amounts of (contingent) financial support – a CHF 100 billion public liquidity backstop to the Swiss National Bank (SNB) to provide funding in resolution and a CHF 9 billion second-loss guarantee to UBS for certain difficult-to-value assets of Credit Suisse – and the SNB provided altogether up to CHF 168 billion in liquidity (under its standard and supplementary emergency liquidity assistance (ELA) and the public liquidity backstop). In both markets, measures succeeded in restoring confidence in the banking system. While other countries experienced some specific fallouts (for example, UK authorities had to resolve a SVB subsidiary) and the market in Europe for AT1 instruments became illiquid for some time, cross-border spillovers were limited.

These large failures and the need for extraordinary interventions revealed, besides failures in bank management and the effects of the changing economic circumstances, several weaknesses in institutional frameworks, many of which were identified in the reports cited above and acknowledged in various official statements and testimonies. They include supervisory failures, mis-calibrated and poorly timed relaxation of regulatory requirements, weaknesses in corporate governance and accounting rules, deficient LOLR facilities, and incomplete recovery and resolution frameworks. The events also highlighted the important interplay between monetary policy and financial stability in that easy monetary policy can contribute to a build-up of vulnerabilities, with a subsequent tightening leading to valuation losses and risks of run-induced insolvencies.

## 2.2 TAKING STOCK OF THE POST-GLOBAL FINANCIAL CRISIS REFORMS

The post-GFC financial reform agenda has been extensive, covering, among others, banking systems, derivatives, resolution and non-bank financial intermediation (NBFI). Much has been completed in these areas over the last 15 years, with the Annual Reports of the Financial Stability Board (FSB) to the G20, starting in 2009, showing the yearly progress in key jurisdictions. However, as the FSB makes clear in its overview of progress as assessed by countries themselves (FSB, 2023b), as of September 2023 key countries

lagged in many areas in the implementation of those reforms agreed many years ago. Table 2.1 (reproduced from the FSB report) shows that in September 2023, reforms relating to risk-based capital standards for banks, resolution frameworks (for banks and central counterparties), and addressing systemic risks related to NBFI (covering money market fund, securitisation, and securities financing transactions) lagged the most. The last two areas are arguably more difficult to harmonise across jurisdictions. For resolution, this reflects the greater diversity in financial, legal, and institutional environments, and that addressing weaknesses in the very largest systemic banks will likely remain a unique endeavour every time. As to the concerns related to NBFIs, these have only become subject to international assessment and standard-setting following recent financial instability events. As such, the fact that many jurisdictions have still not fully implemented internationally agreed banking standards stands out even more.

The Basel Committee on Banking Supervision (BCBS) tracks the banking related reforms in greater detail.[5] The latest BCBS summary (BCBS, 2024b) reviews the state of reforms as of September 2023, i.e., soon after the events. Table 2.2 (reproduced from the summary) shows that the majority of BCBS member countries had by then implemented the Basel III package (as endorsed by the BCBS in December 2017 and January 2019). While there was some delay, by September 2023 many emerging market economies (EMEs) and smaller advanced economies had implemented most, if not all, of the standards endorsed in 2017 and 2019 (the cells in green). Overall, two-thirds of member jurisdictions planned to have implemented all, or the majority of, the Basel III standards by the end of 2024, with the remaining jurisdictions planning to do so in 2025. Note that some of these rules have additional phase-in periods (for example, the output floor only reaches its agreed level of 72.5% by 2028). This implies that for many jurisdictions full implementation (i.e., full Basel III) would only be in place more than 20 years after the GFC.

However, four main advanced economy jurisdictions stand out in this assessment as their full implementation of standards was still to come as of last year: the United States, the European Union, the United Kingdom and Switzerland (cells in yellow). In the last few years, there have been several delays to earlier timelines in the United States and the European Union, as well as in Switzerland and the United Kingdom (which have tended to follow the European Union whenever it delays). And while as of the time of writing, draft regulations on risk-based capital standards, a key area, have been published in these countries, the earliest dates by which most of these could be expected to be in effect were January 2025 (in the European Union, Switzerland, and the United Kingdom) or July 2025 (in the United States). However, some of these timetables are increasingly unlikely to be met, especially in the United States, where the general view is that the proposal will be significantly revised. In the European Union, some policymakers have also signalled their hesitation to complete the so-called 'Basel III endgame' soon, notably if indeed the United States delays further.

5 https://www.bis.org/bcbs/implementation/rcap_reports.htm

## TABLE 2.1 IMPLEMENTATION OF REFORM PRIORITY AREAS BY FSB MEMBER JURISDICTIONS

| | BASEL III^ | | | | | COMPENSATION | OVER-THE-COUNTER (OTC) DERIVATIVES | | | | RESOLUTION | | | | | NON-BANK FINANCIAL INTERMEDIATION | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Reform Area** | Risk-based capital | Require-ments for SIBs | Large exposures framework | Leverage | Net Stable Funding Ratio (NSFR) | | Trade reporting | Central clearing | Platform trading | Margin | Minimum external TLAC for G-SIBs | Transfer / bail-in / temporary stay powers for banks | Recovery and resolution planning for systemic banks | Transfer / bridge / run-off powers for insurers | Resolution planning for systemic CCPs in more than one jurisdiction | Money market funds (MMFs) | Securiti-sation | Securities financing transactions (SFT) |
| *Phase-in (completed) date* | *2023* | *2016 (2019)* | *2019* | *2023* | *2018* | | *end-2012* | *end-2012* | *end-2012* | *2016 (2022)* | *2019/2025 (2022/2028)* | | | | | | | *2017/2023* |
| Argentina | | | C | | C | B, I | | | | | | | | | | | ** | |
| Australia | | | C | | C | | | | | | | | | | | * | | |
| Brazil | | | C | | C | | | | | | | | | | | | ** | |
| Canada | | | C | | C | | | | | | | | | | | | | |
| China | | C | C | | C | | R, F | | | | | | | | | | | |
| France | | C | LC | | LC | | | | | | | | | | | | | |
| Germany | | C | LC | | LC | | | | | | | | | | | | | |
| Hong Kong | | | C | | C | B, I | | | | | | | | | | | | |
| India | | | C | | C | | | | | | | | | | | | | |
| Indonesia | | | C | | C | | | | | | | | | | | ** | | |
| Italy | | C | LC | | LC | | | | | | | | | | | | | |
| Japan | & | C | LC | & | C | B, I | | | | | | | | | | | | |
| Korea | | | | | | | | | | | | | | | | | | |
| Mexico | | | & | | | | | | | | | | | | | ** | * | |
| Netherlands | | C | LC | | LC | | | | | | | | | | | | | |
| Russia[1] | | | | | | | | | | | | | | | | ** | | |
| Saudi Arabia | | | C | | C | B | R | | | | | # | | # | | | | |
| Singapore | | | C | | C | | | | | | | | | | | | | |
| South Africa | | | C | | LC | | | | | | | | | | | | | |
| Spain | | C | LC | | LC | | | | | | | | | | | | | |
| Switzerland | | C | | | | | | | | | | | | | | | *** | |
| Türkiye | | | | | & | | | | | | | | | | | ** | | |
| United Kingdom | | C | | # | | | | | | | | | | | | | | |
| United States | | C, & | LC | | LC | B, I | | | | | | | | | | | | |

## Legend

| | |
|---|---|
| | **Basel III:** Final rule published and implemented. Risk-based capital: revised standardised approach for credit risk and output floor in force. Leverage: revised leverage ratio and G-SIB leverage buffer (as applicable) in force. Requirements for SIBs: covering both D-SIBs and higher loss-absorbency for G-SIBs (for G-SIB home jurisdictions) – published and in force.<br>**OTC derivatives:** Legislative framework in force and standards/criteria/requirements (as applicable) in force for over 90% of relevant transactions.<br>**Resolution:** Final rule for external Total Loss-Absorbing Capacity (TLAC) requirement for G-SIBs published and implemented. For the powers columns, all three of the resolution powers for banks (transfer, bail-in of unsecured and uninsured credit claims, and temporary stay) and insurers (transfer, bridge and run-off) are available. Both recovery and resolution planning processes are in place for systemic banks. For CCPs that are systemically important in more than one jurisdiction (SI>1) resolution planning, crisis management group (CMG) established, cross-border cooperation agreement (CoAg) signed, resolution planning commenced and resolvability assessment commenced.<br>**Compensation:** All or almost all (all but 3 or less) FSB Principles and their Implementation Standards for Sound Compensation Practices (Principles and Standards) implemented for significant banks, insurers and asset managers (as applicable in the jurisdiction – see below).<br>**Non-bank financial intermediation (NBFI):** MMFs – Final implementation measures in force for valuation, liquidity management and (where applicable) stable net asset value (NAV). Securitisation – Final adoption measures taken (and where relevant in force) for an incentive alignment regime and disclosing requirements. SFT: Implementation complete for minimum standards for cash collateral re-investment, regulations on re-hypothecation of client assets, minimum regulatory standards for collateral valuation and management (all due January 2017) and numerical haircut floors on bank-to-non-bank transactions (due January 2023). |
| | **Basel III:** Final rule published but not implemented, or draft regulation published. For risk-based capital column, draft regulation published for at least one of revised standardised approach for credit risk and output floor. For leverage, draft regulation published for at least one of leverage ratio and G-SIB leverage buffer (as applicable).<br>**OTC derivatives:** Regulatory framework being implemented.<br>**Resolution:** Final rule for external TLAC requirement for G-SIBs published but not yet implemented, or draft rule published. For the powers columns, one or two of the resolution powers for banks (transfer, bail-in of unsecured and uninsured credit claims, and temporary stay) and insurers (transfer, bridge and run-off) are available. Recovery planning is in place for systemic banks, but resolution planning processes are not. For SI>1 CCP resolution planning, CMG established and resolution planning commenced but CoAg not signed or resolvability assessment not commenced.<br>**Compensation:** FSB Principles and Standards implemented for some but not all of the applicable banking, insurance and asset management sectors.<br>**NBFI:** MMFs – Draft/final implementation measures published or partly in force for valuation, liquidity management and (where applicable) stable NAV. Securitisation – Draft/final adoption measures published or partly in force for implementing an incentive alignment regime and disclosing requirements. SFT: Implementation complete for at least 1 of the 4 areas described above. |
| | **Basel III:** Draft regulation not published.<br>**Resolution:** Draft rule for external TLAC requirement for G-SIBs not published. For the powers columns, none of the three resolution powers for banks (transfer, bail-in of unsecured and uninsured credit claims, and temporary stay) and insurers (transfer, bridge and run-off) are available. Neither recovery nor resolution planning processes are in place for systemic banks.<br>**NBFI:** MMFs – Draft implementation measures not published for valuation, liquidity management and (where applicable) stable NAV. Securitisation – Draft adoption measures not published for implementing an incentive alignment regime and disclosing requirements. SFT: Implementation not complete for any of the four areas described above. |
| | **Resolution:** Minimum TLAC requirements not applicable for jurisdictions that are not home to G-SIBs or to a subsidiary of a G-SIB that is a resolution entity under a multiple point of entry resolution strategy. |
| **C / LC / MNC / NC** | **Basel III:** Regulatory Consistency Assessment Program (RCAP) – assessed "compliant" (C), "largely compliant" (LC), "materially non-compliant" (MNC) and "non-compliant" (NC) with Basel III rules. See the RCAP scale. The grade for SIB requirements relates only to the G-SIB requirements. |
| **^** | **Basel III:** All FSB jurisdictions have implemented the liquidity coverage ratio and were assessed compliant or largely compliant. All FSB jurisdictions have implemented the initial (2013) risk-based capital framework; 18 jurisdictions have been assessed C or LC, while six jurisdictions were assessed MNC. Leverage ratio column based on the 2017 definition. All FSB jurisdictions but one have implemented the leverage ratio based on the 2014 exposure definition. |
| **&** | **Basel III:** In Japan, banks are allowed to apply the final rule from 31 March 2023 but internationally active banks are required to apply it by 31 March 2024. Mexico's large exposures framework came into force 1 Oct 2023 for SIBs and comes into force January 2024 for other banks. Türkiye's NSFR comes into force 1 January 2024. The US does not identify any additional D-SIBs beyond those designated as G-SIBs; its framework was found to be broadly aligned with the D-SIB principles; see the US RCAP assessment (June 2016). |
| **B / I / A** | **Compensation:** FSB Principles and Standards deemed applicable by the jurisdiction for certain sectors only: banks (B), insurers (I), and/or asset managers (A). |
| **R / F** | **OTC derivatives:** Further action required to remove barriers to full trade reporting (R) or to access trade repository data by foreign authority (F). See the FSB report on Trade reporting legal barriers: Follow-up of 2015 peer review recommendations (November 2018). Mexico issued a regulation in 2020 to allow the direct sharing of Mexican TR data with foreign TRs. |
| **#** | **Basel III:** A few provisions relating to the credit conversion factor will be implemented by the UK in 2025 along with other finalised Basel III reforms.<br>**Resolution:** Saudi Arabia issued a resolution law, which came into force in 2021 and will be followed by detailed rules and regulations to complete implementation. |
| *** / ** / ***** | **NBFI:** Implementation is more advanced than the overall rating in one or more / all elements of at least one reform area (MMFs), or in one or more / all sectors of the market (securitisation). Switzerland reports that it lacks an active domestic securitisation market. The 2019 update was undertaken by IOSCO using the assessment methodology in its 2015 peer reviews in these areas. |
| **1** | **Russia:** The status of implementation in Russia has not been updated and reflects progress only as of end-September 2021. |

Note: The table provides a snapshot of the status of implementation progress by FSB jurisdiction across priority reform areas, as of September 2023. The colours and symbols in the table indicate the timeliness of implementation. For Basel III, the letters indicate the extent to which implementation is consistent with the international standard. For trade reporting, the letters indicate to what extent effectiveness is hampered by identified obstacles. For compensation, letters indicate the sectoral application of the FSB Principles and Standards (where not applied to all sectors).

Source: FSB (2023b).

## TABLE 2.2. BASEL III STANDARDS ADOPTION

| | | AR | AU | BR | CA | CN | HK | IN | ID | JP | KR | MX | RU | SA | SG | ZA | CH | TR | GB | US | EU |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Capital | CCyB | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | MAR NCCD | 1 | 4 | 4 | 4 | 1 | 4 | 2 | 2 | 4 | 2 | 3 | 2 | 4 | 4 | 4 | 4 | 1 | 4 | 4 | 4 |
| | CCP | 4 | 4 | 4 | 4 | 1 | 4 | 3 | 2 | 4 | 4 | 4 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | EIF | 4 | 4 | 4 | 4 | 1 | 4 | na | na | 4 | 4 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 2 | 4 |
| | SA-CCR | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 1 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | SEC | 4 | 4 | 4 | 4 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 1 | 4 | 2 | 4 |
| | TLAC | na | 4 | 4 | 4 | 4 | 4 | 1 | na | 4 | 1 | 4 | 4 | 4 | 4 | 4 | 4 | 1 | 4 | 4 | 4 |
| | CR SA 2023 | 1 | 4 | 4 | 4 | 2 | 2 | 1 | 4 | 3 | 4 | 4 | 2 | 4 | 3 | 2 | 2 | 1 | 2 | 2 | 2 |
| | CR IRB 2023 | na | 4 | 4 | 4 | 2 | 2 | na | na | 3 | 4 | 1 | 4 | 4 | 3 | 2 | 2 | 1 | 2 | na | 2 |
| | CVA 2023 | 1 | 1 | 1 | 3 | 2 | 2 | 1 | 3 | 3 | 4 | 1 | 1 | 4 | 3 | 2 | 2 | 1 | 2 | 2 | 2 |
| | MR 2023 | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 4 | na | 1 | 4 | 3 | 2 | 2 | 1 | 2 | 2 | 2 |
| | OR 2023 | 1 | 4 | 2 | 4 | 2 | 2 | 3 | 4 | 3 | 4 | 4 | 4 | 4 | 3 | 2 | 2 | 1 | 2 | 2 | 2 |
| | OF 2023 | na | 4 | 1 | 4 | 2 | 2 | na | na | 3 | 4 | 1 | 4 | 4 | 3 | 2 | 2 | 1 | 2 | 2 | 2 |
| | RBC 2013 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Leverage | LR EXP 2014 | 4 | 1 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | LR EXP 2017 | 4 | 4 | 1 | 4 | 2 | 2 | 1 | 4 | 3 | 4 | 1 | 1 | 4 | 3 | 2 | 2 | 2 | 4 | 4 | 4 |
| SIB | G-SIB | na | na | 4 | 4 | 4 | 4 | na | na | 4 | 4 | na | na | na | 4 | na | 4 | na | 4 | 4 | 4 |
| | D-SIB | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | na | 4 |
| | LR-Buffer | na | na | na | 4 | 4 | na | na | na | 4 | na | na | 1 | na | na | na | 4 | na | 4 | 4 | 4 |
| IRRBB | IRRBB | 4 | 2 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 2 | 2 | 4 | 4 | 4 | 4 | 1 | 4 | 4 | 2 |
| Liquidity | IDL | 4 | 4 | 4 | 4 | 1 | 4 | 4 | 4 | 1 | 1 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | NSFR | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 |
| | LCR | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Large exposur.. | LEX | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 2 | 3 | 2 | 4 | 4 | 4 | 4 | 2 | 4 | 4 | 4 |
| Crypto | Crypto | na | 1 | 1 | 2 | | 1 | na | na | 1 | 1 | na | | na | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Disclosure | DISC Pillar III | 4 | 3 | 4 | 4 | 2 | 4 | 1 | 4 | 4 | 4 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | na | 4 |
| | DISC DEC 20.. | 4 | 3 | 4 | 3 | 2 | 4 | 1 | 4 | 4 | 4 | 2 | 4 | 4 | 4 | 4 | 4 | 2 | 4 | 4 | 4 |
| | DISC JAN 2018 | 4 | 2 | 4 | 3 | 2 | 4 | 2 | 4 | 4 | 4 | 4 | 2 | 4 | 4 | 3 | 4 | 3 | 4 | 4 | 4 |
| | DISC DEC 20.. | 4 | 3 | 4 | 3 | 2 | 4 | 1 | 4 | 1 | 4 | 1 | 4 | 4 | 4 | 4 | 4 | 1 | 4 | 4 | 4 |
| | DISC TLAC | na | na | 1 | 4 | 2 | 4 | na | na | 4 | 3 | 4 | na | 4 | na | na | 4 | na | 4 | 4 | 4 |
| | DISC MR 2023 | | 1 | | 2 | 2 | 2 | | 3 | 3 | 4 | 1 | | 4 | 3 | 2 | 2 | | 2 | | 2 |
| | DISC Jan 2023 | 1 | 3 | | 3 | 2 | 2 | 2 | 3 | 3 | 4 | 2 | | 4 | 3 | 2 | 2 | | 2 | 1 | 2 |

1 draft regulation not published
2 draft regulation published
3 final rule published (not yet implemented by banks)
4 final rule in force (published and implemented by banks)
na not applicable

Select period 30/09/2023

Select standard (All)

Adoption Status
adoption completed
adoption in progress
adoption not started
not applicable
standard not yet due

Source: BCBS (https://www.bis.org/bcbs/implementation/rcap_reports.htm).

Reforms are thus incomplete and recent progress has slowed, notably so in exactly those jurisdictions that experienced financial turmoil in March 2023. Moreover, reforms agreed some time ago may not be adequate to address some of the existing, let alone newly emerging, risks. Risks always evolve and new vulnerabilities can emerge, but this may especially be the case given the many shocks affecting economies and financial systems recently (e.g., COVID-19, the war in Ukraine, high inflation and the related higher interest rates, rising geopolitical tensions, as well as accelerating climate change). Many of these old and new vulnerabilities are identified by authorities in the countries themselves and well documented in the various regular financial stability reports[6] and other such stock-takes and analyses.[7] Chapter 3 analyses in detail key vulnerabilities, their drivers, how they relate to the events in March 2023 for the banking systems in the United States and Europe, and whether the reforms in place and proposed suffice to deal with the vulnerabilities.

## 2.3 CONDITIONS OF US AND EUROPEAN BANKS PRIOR TO THE MARCH 2023 EVENTS

To further set the stage and identify key areas of concern, this section provides, for a sample of banks in Europe and the United States (and comparatively), data on capitalisation, asset composition and quality, profitability and market valuation prior to the events of March 2023.[8] It covers those banks that are part of the stress tests conducted regularly by the European Banking Authority (EBA) and adds to that sample the other five G-SIBs[9] not covered in these tests (three from the United Kingdom and two from Switzerland), to make for a sample of 70 European banks (see Appendix 1 for a list of all European banks covered in the table and analysis). For the US, the sample covers the largest 219 banks. With countries ordered by the size of total bank assets covered, Table 2.3 shows the key balance sheet data as of end-2022 and profitability statistics for the year 2022.

The total balance sheets of our sample of European and US banks amount to about $34 trillion and $23 trillion, respectively. In terms of regulatory capital requirements, European banks are well capitalised, with an average Tier 1 ratio of 17.25% and an equity-to-asset ratio of 6.28%. Tier 1 ratios for the 70 European banks are above the average level for the largest 219 US banks, which stood at 13.24% as of end-2022. While US banks have a lower average Tier 1 ratio, their average leverage ratio is about 50% higher. This difference between the Tier 1 and equity-to-asset ratios reflects the substantially lower ratio of risk-weighted assets (RWA) to total assets of European banks. This is in turn largely related to the European banks holding more sovereign bonds than US banks and such assets having a zero risk-weight.

6 For example, FRB (2024a), ECB (2024a), Bank of England (2024), SNB (2024) and IMF (2024).
7 See, for example, Abad et al. (2022) and ESRB (2023) for Europe, Acharya et al. (2023a) for the United States, and the FSB's annual Global Monitoring Report (FSB, 2023c) on the risks from non-bank financial intermediation; for an overall analysis of current vulnerabilities, see IMF (2024).
8 See also BCBS (2024a) for its latest semi-annual monitoring of capital for a broad sample of international banks.
9 G-SIBs are identified every year, as in FSB (2023d) using 2022 data; at that time, Credit Suisse was dropped as it had moved below the threshold for G-SIB designation, but it is included here as it was a G-SIB previously.

TABLE 2.3 **BALANCE SHEET AND PROFITABILITY CHARACTERISTICS OF US AND EUROPEAN BANKS**

| Country | No. of banks | Assets | Tier 1 | Equity/assets | RWA/assets | NPL/ assets | NIM | CIR | ROAE |
|---|---|---|---|---|---|---|---|---|---|
| **Total Europe** | **70** | **33,786** | **17.25%** | **6.28%** | **36.82%** | **1.28%** | **1.56%** | **58.44%** | **8.72%** |
| **US** | **219** | **22,642** | **13.24%** | **10.02%** | **76.20%** | **0.50%** | **3.00%** | **NA** | **11.70%** |
| **Europe, of which:** | | | | | | | | | |
| France | 6 | 9,704 | 15.55% | 3.63% | 23.59% | 0.93% | 0.85% | 66.57 | 6.15% |
| UK | 3 | 5,233 | 17.01% | 4.69% | 26.85% | 0.70% | 1.06% | 59.85 | 7.66% |
| Germany | 12 | 4,025 | 17.48% | 6.24% | 36.06% | 0.80% | 0.89% | 67.69 | 5.01% |
| Spain | 8 | 3,646 | 14.64% | 6.00% | 38.28% | 1.70% | 1.57% | 53.98 | 8.31% |
| Italy | 8 | 2,653 | 17.05% | 6.96% | 37.28% | 2.13% | 1.47% | 63.64 | 7.79% |
| Netherlands | 4 | 2,049 | 18.32% | 5.14% | 31.82% | 1.16% | 1.35% | 64.55 | 6.75% |
| Switzerland | 2 | 1,571 | 19.11% | 6.82% | 38.04% | 0.25% | 0.72% | 93.37 | -1.55% |
| Sweden | 5 | 981 | 18.97% | 4.85% | 25.33% | 0.16% | 1.10% | 45.65 | 11.14% |
| Denmark | 4 | 850 | 18.29% | 5.52% | 28.17% | 0.99% | 1.15% | 60.83 | 7.11% |
| Finland | 2 | 728 | 17.72% | 3.50% | 27.98% | 0.35% | 0.77% | 56.02 | 9.12% |
| Austria | 2 | 531 | 16.86% | 6.51% | 45.48% | 1.40% | 2.21% | 49.35 | 16.29% |
| Ireland | 3 | 414 | 18.95% | 6.70% | 33.59% | 1.27% | 1.25% | 66.71 | 5.07% |
| Belgium | 1 | 355 | 16.66% | 5.73% | 31.02% | 1.10% | 1.50% | 54.25 | 13.13% |
| Greece | 4 | 313 | 15.13% | 8.07% | 46.03% | 2.36% | 2.05% | 41.48 | 15.50% |
| Norway | 1 | 307 | 19.63% | 7.22% | 32.84% | 0.85% | 1.61% | 38.73 | 14.04% |
| Portugal | 2 | 192 | 16.26% | 7.12% | 45.13% | 1.31% | 1.94% | 56.3 | 5.90% |
| Poland | 2 | 152 | 16.77% | 8.18% | 52.97% | 2.79% | 2.98% | 55.69 | 8.72% |
| Hungary | 1 | 82 | 16.06% | 10.11% | 62.20% | 2.77% | 3.68% | 57.31 | 10.91% |

Notes/Sources: Assets is bank total assets reported in billions of dollars. Tier 1 is Tier 1 capital scaled by risk-weighted assets (RWA). Equity/Assets is book equity over total assets. RWA/Assets is risk-weighted assets over total assets. NPL/Assets is non-performing loans over total assets. NIM is the Net-Interest-Margin, defined as net interest income as a percentage of average earning assets. CIR is the cost-income ratio. ROAE is bank profitability, measured as net income over average total assets. European data are sourced from either S&P Capital IQ (formerly SNL Financials) or the EBA stress tests or transparency exercise in 2023, and US data from the call reports provided by the FFIE (www.cdr.ffiec.gov).

In terms of default risks, European banks' non-performing loan (NPL) ratios are more than twice as high as those of US banks. And European banks are less profitable: their net interest margin (NIM) is 1.56% (versus 3% for US banks) and their return on assets (ROAE) is 8.72% (versus 11.7% for US banks).

Europe is not a homogenous banking system, however, and there are important differences across countries in bank size as well as in capitalisation and profitability. The United Kingdom and France have the largest banks on average in the sample, and Greece, Hungary and Poland the smallest. Capital ratios are high for all countries: in terms of Tier 1, with percentages all in the mid- to upper-teens. Equity-to-asset ratios vary more widely, from the highest of 10.11% in Hungary, followed by Poland and Greece, to the lowest in France (3.63%) and Finland (3.50%, covering one G-SIB and one other bank). This variation in leverage mainly reflects the large differences in risk densities (for example, the French banks have the lowest RWA-to-asset ratio of 23.59%). The US banks have on average much higher leverage (10.02%) than all European countries except for Hungary. NIMs are lower in almost all European countries than in the United States.[10] Profitability is more diverse, but even so the ROAE for banks in about two-thirds of European countries is lower than that for the US banks, possibly related to differences in market structure (the United States has seen a rapid increase in banking concentration in the last few years, whereas in the euro area the system remains fragmented along national lines).

The relative picture changes more substantially when done based on market assessments. Table 2.4 provides, for a smaller set of publicly listed banks (their total balance sheet is similar though, at about 87% of the earlier sample), market indicators such as overall capitalisation, the market-to-book (MTB) price ratio, and beta (the sensitivity of the banks' stock prices to the overall stock market).

Overall, the table shows that markets expressed more scepticism prior to the events of March 2023 about the value and performance of many European banks compared to US banks. While the total book value of European banks' assets is higher than that of the US sample ($26 trillion versus $23 trillion), their overall market value is only about 37% that of US banks. This low valuation also shows up in the low MTB price ratios of European banks, mostly below 1, with only five of the 17 banking systems having a ratio at end-2022 greater than 1, making for an average MTB price ratio of 0.77 (compared to 1.35 for the US banks). The average market value relative to assets (MarketCap/Assets) of the European banks is correspondingly lower at 4.93% versus 12.83% for US banks, and the Quasi-Leverage is 33.12 versus 8.96.

10 Call report data for US banks do not provide a cost-to-income ratio.

TABLE 2.4 **MARKET VALUATION AND OTHER MEASURES FOR US AND EUROPEAN PUBLICLY LISTED BANKS**

| Country | No. of Banks | Assets | MarketCap ($ billion) | MTB | MarketCap/asset | Beta | Correlation | Quasi-Leverage |
|---|---|---|---|---|---|---|---|---|
| **Total Europe** | **45** | **26,398** | **873** | **0.77** | **4.93%** | **1.21** | **0.43** | **33.12** |
| **US** | **214** | **22,571** | **2,351** | **1.35** | **12.83%** | **0.73** | **0.54** | **8.96** |
| **Europe of which:** | | | | | | | | |
| UK | 3 | 5,233 | 165 | 0.59 | 2.83% | 1.12 | 0.44 | 39.64 |
| Spain | 6 | 3,503 | 121 | 0.63 | 3.67% | 1.13 | 0.42 | 36 |
| Italy | 6 | 2,386 | 82 | 0.49 | 3.52% | 1.14 | 0.42 | 66.18 |
| Germany | 2 | 1,814 | 33 | 0.38 | 1.97% | 1.4 | 0.44 | 61.99 |
| Switzerland | 2 | 1,571 | 65 | 0.63 | 3.64% | 1.42 | 0.48 | 32.95 |
| Netherlands | 2 | 1,347 | 53 | 0.69 | 3.66% | 1.17 | 0.45 | 53.34 |
| Sweden | 3 | 883 | 59 | 1.15 | 6.73% | 1.13 | 0.48 | 17.8 |
| Denmark | 3 | 635 | 22 | 0.92 | 5.40% | 1.08 | 0.38 | 26.94 |
| Finland | 1 | 595 | 36 | 1.21 | 6.14% | 1.12 | 0.49 | 17.32 |
| Austria | 2 | 531 | 17 | 0.51 | 3.10% | 1.43 | 0.44 | 35.12 |
| Belgium | 1 | 355 | 25 | 1.23 | 7.07% | 1.3 | 0.46 | 15.63 |
| Greece | 4 | 313 | 11 | 0.45 | 3.64% | 1.15 | 0.31 | 33.19 |
| Norway | 1 | 307 | 29 | 1.29 | 9.32% | 1.07 | 0.43 | 11.28 |
| Ireland | 2 | 281 | 19 | 0.87 | 6.87% | 1.11 | 0.36 | 21.52 |
| Poland | 2 | 152 | 13 | 1.03 | 8.43% | 1.37 | 0.41 | 12.05 |
| Portugal | 1 | 90 | 2 | 0.47 | 2.46% | 1 | 0.36 | 40.39 |
| Hungary | 1 | 82 | 7 | 0.85 | 8.62% | 1.34 | 0.36 | 10.94 |

Notes/sources: Assets is bank total assets reported in billions of dollars. MarketCap is the number of shares times the share price as of 30 December 2022, also in billions of dollars. MTB is the market-to-book ratio measured as MarketCap over the book value of equity. MarketCap/Assets is market capitalisation over total assets. Beta is the beta of the bank with respect to the MSCI World Index (using a dynamic conditional correlation model). Correlation is the dynamic correlation between the equity return of the bank and the return on the MSCI All-Country World Index. Quasi-leverage is 1 plus the book value of liabilities divided by the market value of equity. Beta, Correlation and Quasi-Leverage are sourced from the NYU Volatility Lab, the remaining data from Capital IQ.

These large valuation differences are not a new phenomenon and many explanations have been put forward, including European banks being riskier. The ECB (2023), for example, attributes the low valuation to the high cost of capital (i.e., a high equity premium). Indeed, it appears that banks in Europe are more exposed to the overall stock market than US banks as their betas are substantially higher. This suggests that the higher book capital of European banks does not make for a lower overall perceived riskiness and that the higher riskiness explains some of the valuation differences. But the low profitability of European banks likely explains a substantial part of their lower equity valuation too. Overall, the market data-based comparison suggests that the typical European bank risk appears higher and business model less profitable.

In conclusion, prior to the failures in March 2023, European banks appeared to be better capitalised than US banks in terms of their Tier 1 ratios. But much of this favourable comparison reflected their high sovereign holdings (with zero risk-weight), as seen from their much lower equity-to-asset ratios. As such, European banks were not obviously sounder prior to the events of 2023. And US banks performed better than European banks in terms of profitability metrics and market valuations. Chapter 3 explores in more detail some of the drivers of these differences in the measures and their implications.

# CHAPTER 3



# Weaknesses revealed by the March 2023 events and others known but hiding: Europe and the United States

This chapter analyses in detail key current weaknesses and vulnerabilities in the European and US banking systems, some revealed by the March 2023 events and others known but hidden.

## 3.1 EUROPEAN BANKING SYSTEMS: STRENGTHS, WEAKNESSES AND LESSONS

To assess current risks, the chapter first takes stock of developments, conditions and reforms in the EU banking systems over the past decade. It then analyses the main current vulnerabilities, focusing on funding fragilities that can show up unexpectedly, the still present bank–sovereign links that can re-emerge and trigger doom loops, and significant exposures to real estate, global economic developments and fragmentation.

### 3.1.1 Developments and reforms in the EU banking systems over the past decade

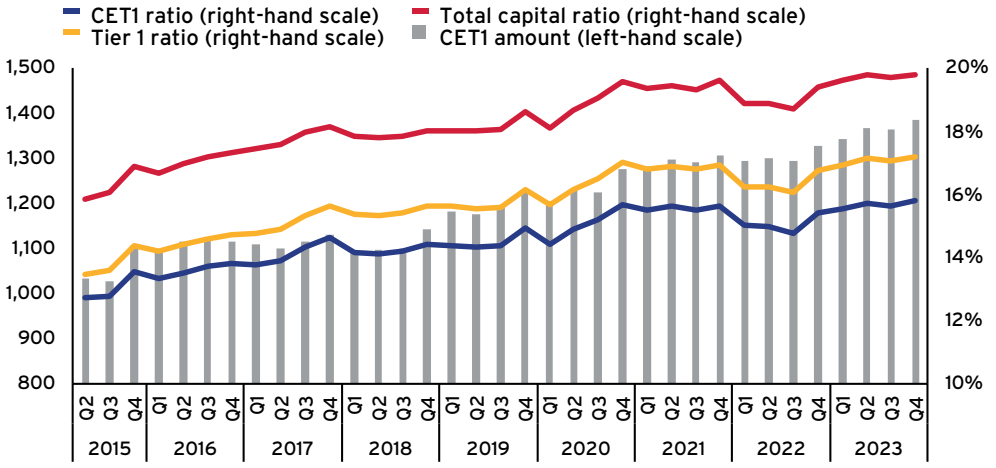
The euro area banking sector made major progress in the last decade on measures of solvency and liquidity, largely due to improved bank governance and supervision. This helped the sector to go through the March 2023 turmoil largely unscathed. That said, profitability and valuations remained low and some weaknesses persisted, partly linked to incomplete reform.

*Balance sheets improved*

Capital ratios have risen over the past ten years and are now at comparatively elevated levels (Figure 3.1). Questions remain, however, over whether risk-weights are properly determined and used. Notably, sovereign exposures of all member states, while not riskless, carry zero-weight. Risk-weights on other exposures are partly assessed using internal models, which are potentially faulty or biased, though years of SSM supervision with rigorous and transparent processes have likely reduced this problem.

FIGURE 3.1 **CAPITAL RATIOS AND THEIR COMPONENTS**

(€ billions; percentages)

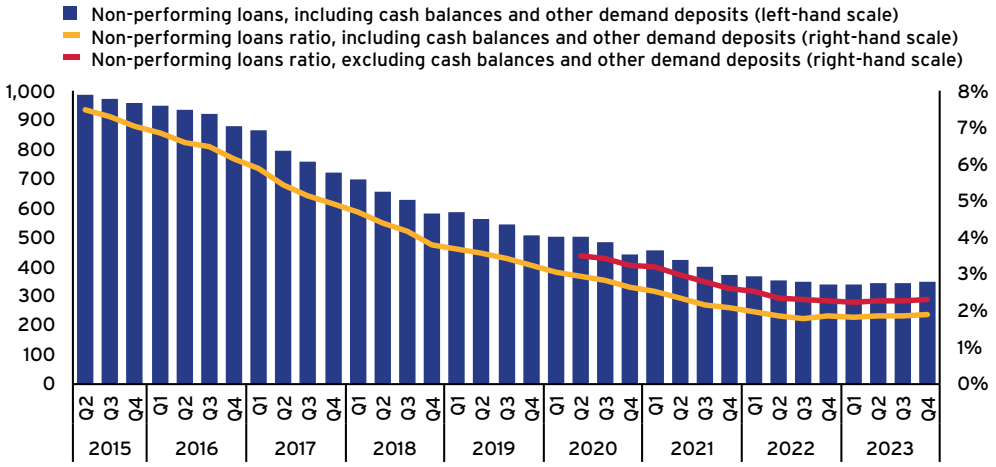



Source: ECB press release on supervisory data, 10 April 2024.

NPL ratios were very high, especially in the stressed countries after the GFC and euro crisis, but are now roughly in line with international norms (Figure 3.2), though still higher than in the United States. Proactive and transparent supervisory action has been effective, with NPLs now measured in harmonised ways and comparable across countries.

FIGURE 3.2 **NON-PERFORMING LOANS**

(€ billions; percentages)




Source: ECB press release on supervisory data, 10 April 2024.

Liquidity and funding structures have also improved for the euro area as a whole as well as for individual jurisdictions. The liquidity coverage ratio (LCR)[11] is now above 200% on average (and around 150% for G-SIBs). The net stable funding ratio (NSFR)[12] is over 130%. [13]

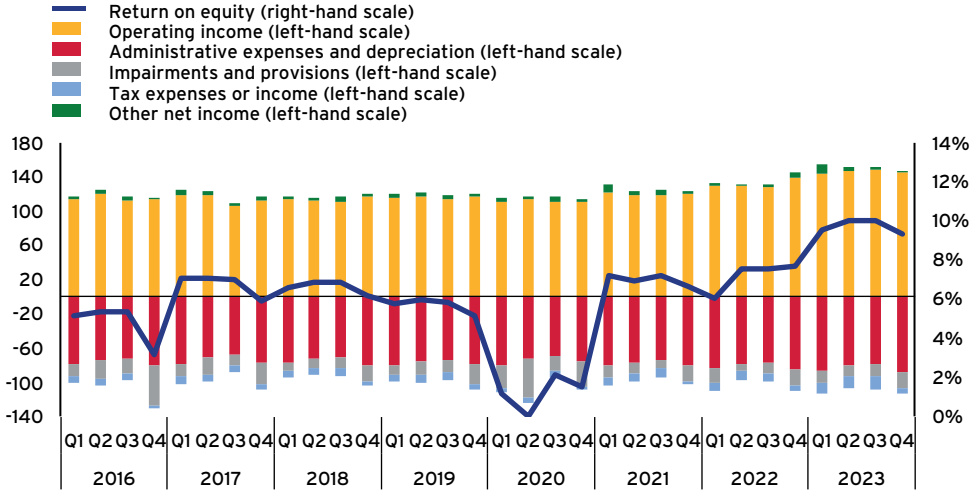
These numbers compare favourably not only historically, but also with other jurisdictions. The high-quality capital ratio for the 23 large US banks subject to the Federal Reserve stress tests increased over the same time period by just 2 percentage points, from about 10% to just over 12%. And the LCR of the four largest US banks ranges from 112% to 123% today.[14] The progress made by euro area banks in terms of solvency, liquidity and asset quality thus appears greater than that made by their US comparators.

*But profitability and market measures are less improved*

As noted in Chapter 2, weak spots are profitability and stock market valuations. Return on equity (RoE) was consistently low in the past decade, in part due to low interest margins and high loan-loss provisions (Figure 3.3). Both factors have improved recently, raising RoE to close to 10%. This appears sustainable unless very low (or even negative) interest rates return. But the recent improvement is mainly due to higher operating income; administrative costs are still high, calling for greater efficiency.

FIGURE 3.3 **RETURN ON EQUITY AND COMPOSITION OF NET PROFIT AND LOSS**

(€ billions; percentages)




Source: ECB press release on supervisory data, 10 April 2024.

11 Highly liquid assets as a percent of expected cash outflows over a 30-day period, in adverse conditions.
12 Funding sources weighted by stability factors in percent of assets weighted by illiquidity factors
13 Data sources: Angeloni (2021), EBA (2015) and ECB (2024b). In both cases, the minimum requirement is 100%.
14 Data on common equity ratios are from FRB (2023). The LCRs for the four largest US banks (JPMorgan, Bank of America, Wells Fargo and Citigroup), available from their quarterly disclosures, vary between 112% and 123%.

Markets seem to consistently judge the euro area balance sheet improvements differently. While capital ratios increased sharply, the average market-to-book (MTB) ratio actually trended downwards until 2019 and while it improved somewhat afterwards, it never made it above 0.9 (Figure 3.4).

FIGURE 3.4 **TIER 1 AND MARKET-TO-BOOK RATIOS OF EUROPEAN BANKS, 2010-2023**

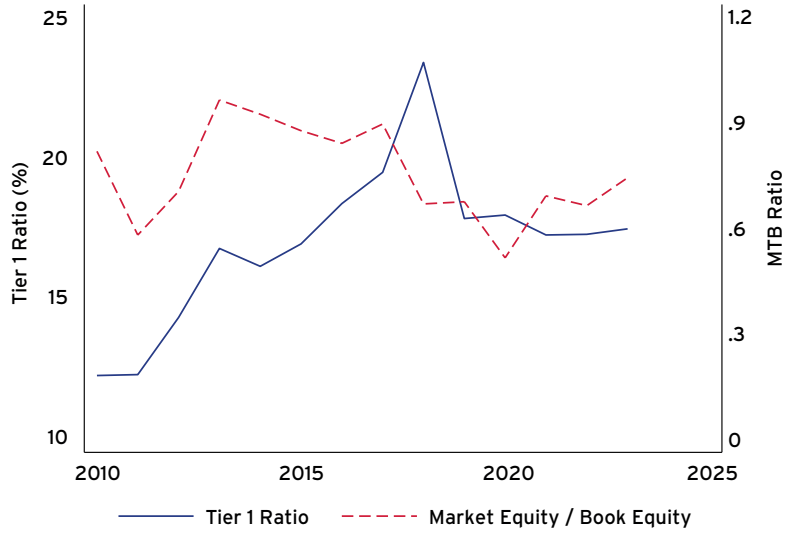
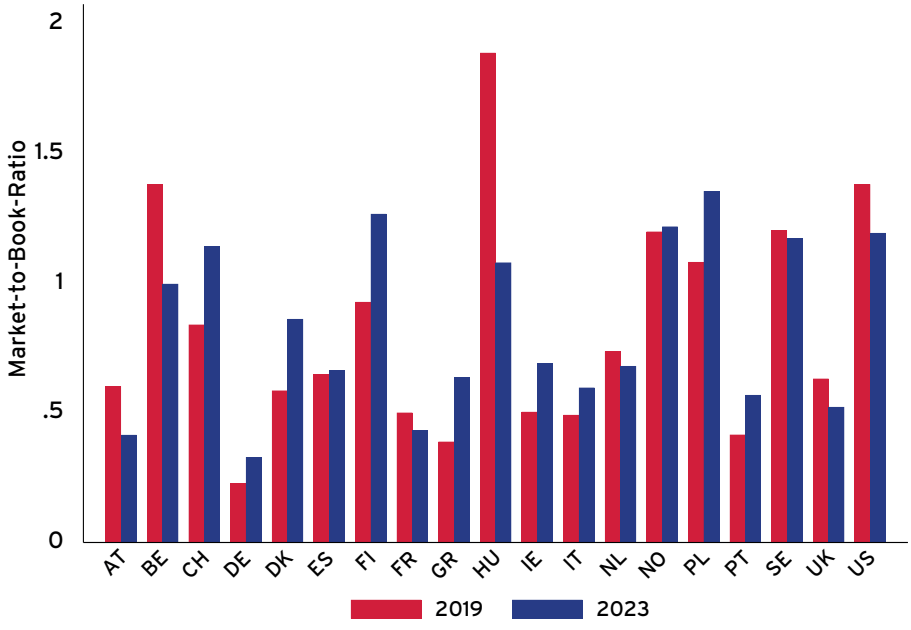



FIGURE 3.5 **MARKET-TO-BOOK RATIOS BY COUNTRY, 2019 AND 2023**




Source: Capital IQ and Call Reports, Compustat/CRSP.

This pattern is common to many countries from 2019 to 2023 (Figure 3.5). Consistent with Figure 3.4, the MTBs of most European banks increased, but only in a handful European countries do they average above 1. While the MTB ratios of US banks have decreased (particularly in 2023 after the SVB default), MTB ratios in many European countries were below, and in some cases far below, those of US banks in 2023. More recently, valuations of major listed euro area banks have improved significantly, yet they still have not closed the gap with their US peers. This underscores that investors perceive future profitability to be lower and/or risks to be higher than reported regulatory capitalisation figures. And the low valuations may still reflect investors' worries about the large (political) hurdles to complete some important reforms.





*Many reforms were implemented, but some are still incomplete or missing*

There has been much reform over the last 15 years. Most notable was the enactment in 2014 of the Banking Union, a package of wide-ranging regulatory and institutional reforms (see Box 3.1). The supervisory part of the Banking Union (the SSM) clearly helped increase capitalisation and reduce NPLs. The SSM now conducts a state-of-the-art Supervisory Review and Evaluation Process (SREP) on a yearly basis with a harmonised and transparent methodology. Stress tests conducted by the EBA and the ECB explicitly include market risks in addition to credit risks, unlike in the United States. However, after the GFC, unrealistic stress scenarios neglected major risk sources, notably sovereign risks. This raised concerns about the credibility of results and failed to assure investors that problem institutions were adequately identified. The stress scenarios have been improved since, but the absence of capitalisation strategies and a public backstop for failing banks suggest that the results are de facto non-binding. Overall, despite much work, efforts so far have not been as successful as expected, including in improving the market view of banks.

BOX 3.1 **BANKING UNION, CAPITAL MARKETS UNION (AND FISCAL UNION): TOO LITTLE SO FAR?**

Besides building a credible and unified framework of regulation (albeit with no limits to institution-specific exposure to sovereign risk) and supervision in the form of the SSM, the Banking Union involved efforts towards enhancing restructuring and resolution proceedings through the Single Resolution Board (SRB). The Banking Union has been effective but is still missing three key components.

The first is an area-wide deposit guarantee scheme. Currently, deposit guarantee schemes are national or even fragmented within countries, with widely differing legal frameworks and financial solidity. Efforts by the European Commission to enact a unified area-wide scheme have been torpedoed politically, in particular due to worries about asymmetric sovereign risks and excessive home bias in bank portfolios. As of today, no progress is in sight.

BOX 3.1 **(CONTD.)**

The second is a strong Banking Union-wide resolution framework. The size of the Single Resolution Fund (SRF) is likely insufficient, especially after Italy (acting alone) blocked the ratification of the new European Stability Mechanism (ESM) treaty that would have provided a public backstop to the SRF. Moreover, the usability of the SRF is doubtful (it has never been used) due to excessive bail-in requirements as a precondition for access. Furthermore, the SRB does not possess the instruments and powers available to the Federal Deposit Insurance Corporation (FDIC) for example, such as receivership and the power to invoke systemic exceptions. Legislative proposals by the Commission, tabled in April 2023, address some issues, but not all, and the approval process of this new piece of legislation is expected to last years (Angeloni, 2024; Acharya et al., 2024).

The third missing component is a strong single macroprudential framework. Macroprudential powers remain fragmented, with the key ones remaining with member states and only some entrusted to the ECB, and then even not fully. Remarkably, the ECB does not control macroprudential buffers even when included in EU legislation; it can only tighten them, and even this power has been used sparingly. As a result, marked and apparently unjustified asymmetries exist in how the countercyclical capital buffer is administered.[15]

Together with the Banking Union (and the Monetary Union), the Capital Markets Union (CMU) was supposed to form a strong European market infrastructure and avoid sharp capital movements between weaker and stronger countries. However, with the Banking Union incomplete and no progress on the CMU, financial integration is far from complete. Furthermore, as Acharya and Steffen (2017) argue, even a completed Banking Union and CMU supported by a ratified ESM would not assure integration. A Fiscal Union is needed to create a common 'safe asset' and avoid capital moving from riskier to safer countries during periods of aggregate stress, with associated risks of self-fulfilling liquidity crises and sovereign–bank doom loops (De Grauwe and Ji, 2013). But for this there appears to be no political consensus.

### 3.1.2 Developments in Switzerland

*Post-GFC reforms and capitalisations*

During the GFC, the Swiss government and the SNB provided state support to UBS of about CHF 60 billion, which succeeded in stabilising the bank but was very unpopular and thus politically very costly. Swiss authorities moved quickly to install a 'too big to fail' (TBTF) framework to prevent the failure of a G-SIBs and, in case of failure, to organise resolution without any type of public intervention or support. For prevention, the focus was on high capital buffers, colloquially called the 'Swiss finish' since they were set above the FSB minima. Swiss G-SIBs' risk-weighted going concern capital minimum was set at 14.3%, of which no more than 4.3% is to be filled by AT1 instruments,[16] and a minimum total loss-absorbing capacity (TLAC) was set at 28.6% of risk-weighted assets and 10% of total assets.[17] It is noteworthy that Credit Suisse's capital ratios were substantially above

15 See the European Systemic Risk Board's assessment at https://www.esrb.europa.eu/national_policy/ccb/html/index.en.html.
16 Add-ons and countercyclical capital buffers are additional.
17 More precisely, of the leverage ratio denominator.

these minimum requirements until the end: it failed with capital at 20% (7.6% leverage ratio) (see Table 3.1). Moreover, it had an additional 20% (almost CHF 50 billion) in gone concern bail-in bonds, which would have been converted if the resolution plan had been activated.





*Capitalisation weaknesses*

*Prima facie*, capital was thus not Credit Suisse's main problem. Rather, loss of trust in the business model, governance and risk management was the main driver (see Box 2.1 in Chapter 2). However, at a deeper level, the location and forms of capital did play a role in the fragility of Credit Suisse. For one, it was impossible to move capital across legal entities and jurisdictions, which limited options for resolution and created concerns about the availability of capital at the parent bank level, the entity paying dividends. Market participants did note the problems in the structure of capital and raised doubts about the availability of capital in the parent bank. Autonomous, a market research firm, issued a report in 2021 on Credit Suisse titled *Less than meets the eye*. In addition to fears about 'trapped capital', it raised questions over accounting, double leverage and the regulatory treatment of participations, suggesting that de facto capital was less than regulatory numbers. And before its collapse, market participants were questioning the relevance and transparency of published indicators – clearly not good for confidence.

Second, Credit Suisse's AT1 instruments did not fulfill their intended role as automatic stabilisers (recapitalising the bank as a going concern). The trigger was never activated since Credit Suisse capital always remained comfortably above the 7% trigger. In addition, the bank never restricted payouts on AT1 and always called them at the first call date to avoid sending adverse signals to the market. This was costly: the last AT1 issue in summer of 2022 paid almost 10% (in US dollars). This made the AT1s procyclical financing – contrary to their intended role as loss-absorbing capital in going concern. In sum, although the Credit Suisse failure was largely 'homemade' due to its systemic risk management failures, it does hold broader lessons about possible hidden vulnerability in the intragroup capital allocation and the capital structure of global banks.

TABLE 3.2 CAPITAL RATIOS OF CREDIT SUISSE AND MINIMUM REQUIREMENTS IN 2022/23 (BILLIONS OF CHF)

| | Q1 2023 | | Q4 2022 | | Q3 2022 | | Min. |
|---|---|---|---|---|---|---|---|
| **Capital, risk-weighted** | | | | | | | |
| CET1 | 35.8 | 14.7% | 36.7 | 14.6% | 39.9 | 14.6% | 10.0% |
| CAT1 + AT1 (going concern) | 49.4 | 20.3% | 50.0 | 19.9% | 50.1 | 18.3% | 14.3% |
| TLAC (going and gone concern) | 97.9 | 40.2% | 99.1 | 39.5% | 97.4 | 35.5% | 28.6% |
| Risk-weighted assets | 243.8 | | 251.0 | | 274.1 | | |
| **Capital, unweighted** | | | | | | | |
| Leverage ratio CET1 | 32.8 | 5.0% | 32.7 | 5.0% | 41.7 | 4.9% | 3.5% |
| LR CET1 and AT1 (going concern) | 49.4 | 7.6% | 50.0 | 7.7% | 50.1 | 5.9% | 5.0% |
| TLAC (going and gone concern) | 97.9 | 15.0% | 99.1 | 15.2% | 97.4 | 11.5% | 10.0% |
| LR denominator | 653.0 | | 650.5 | | 836.9 | | |
| Total assets | 540.3 | | 531.4 | | 700.4 | | |

Source: Expert Group on Banking Stability (2023).

### 3.1.3 The role of monetary policy in the buildup of demandable deposits and funding risks

**One of the main vulnerabilities of banks originated from the various rounds of QE after the GFC**. Despite these liquidity injections, markets experienced substantial dysfunction both in 2019, when reserves flowed into the Treasury's Fed account, and in 2020, during the COVID-19 outbreak that led to a 'dash for cash' (Kashyap, 2020). While the March 2023 runs are often attributed to poor risk management in banks and weak regulatory oversight, Acharya et al. (2023b) argue that the changes in the Federal Reserve's balance sheet made banks more susceptible to such liquidity risks (see Box 3.2). More generally, expansion and shrinkage of central bank balance sheets can lead to liquidity dependence of banks, making for potential trade-offs between monetary policy and financial stability.

### BOX 3.2 **QE AND QT AND EFFECTS ON BANK LIQUIDITY DEPENDENCE**

The Federal Reserve started its quantitative tightening (i.e., a reduction of its balance sheet) in June 2022, followed by the ECB in March 2023. But the Federal Reserve had already engaged in QT in 2017. Acharya et al. (2023b) could thus investigate the consequences of a reduction in a central bank's balance sheet. They explored in detail what happens to commercial bank balance sheets when the central bank's balance sheet first increases and then decreases, and whether this heightens the risk of systemic liquidity stress. They focus on the Federal Reserve's balance sheet changes from late 2008 to early 2023, covering QE and QT periods. Central banks can inject liquidity by either buying assets from banks, which increases bank reserves (effectively in an asset swap), or by buying assets from non-banks. As the latter cannot hold reserves with central banks, they deposit the liquidity with banks, which, in turn, increase reserves with central banks. As a consequence, bank balance sheets expand and deposits increase mechanically.

However, during QE, banks increased specifically the issuance of *uninsured* demand deposits prone to runs and wrote more credit lines to corporations, often used in times of stress (Acharya and Steffen, 2020). Contrary to expectations, banks reduced their time deposits. When QT began in 2022, the ratio of demandable claims to potential liquidity rose sharply, a trend that continues. During QE, commercial banks thus expanded their balance sheets, acquiring more demandable claims. But these claims did not decrease commensurately during QT, leading to increased liquidity dependence. This liquidity mismatch remains and could mean that banks might need more central bank support in the future if stress arises. In bank-level tests, Acharya et al. (2023b) show that central bank liquidity increases the supply of uninsured deposits and credit lines, holding customer demand constant.

Banks may behave differently during QE and QT because in QT they believe they can replace lost reserves with bonds eligible for repo transactions. However, as Acharya et al. (2023b) show, this creates a dependency on a decreasing amount of ultimate liquidity (reserves), leading to fragility when many banks simultaneously seek to convert assets into cash. In the United States, the ratio of demandable claims (such as uninsured deposits and credit lines) to liquidity (reserves and repo-eligible assets) varies significantly among banks. Since 2009, smaller banks not bound by the LCR have increased this ratio, except during the bank runs of March 2023. In contrast, larger banks under strict LCR regulations have seen a decline in this ratio since 2012. The distribution of this ratio has generally shifted towards higher levels through various QE episodes and continued this trend during pre-pandemic QT, leading to a greater number of banks with higher ratios at the onset of COVID-19.

Acharya et al. (2023b) also examine the impact of liquidity risk exposure, measured as the ratio of demandable claims to potential liquidity, on bank performance during financial stress. In two instances of financial fragility – March 2020 during the COVID-19 outbreak and March 2023 during the bank runs and uninsured deposit outflows – banks with a higher ratio performed worse. In March 2020, corporations drew more from credit lines of these exposed banks, possibly fearing future unavailability. In March 2023, there were significant deposit withdrawals from vulnerable mid-sized and smaller banks due to concerns about solvency and liquidity. In both scenarios, banks with higher liquidity risk ended up increasing their dependence on the Federal Reserve, with discount window borrowing peaking at $196.2 billion in 2020 Q1 and $260.3 billion in 2023 Q1. Data also indicate that in 2020, banks with greater liquidity risk exposure relied more on the Federal Reserve's discount window, and in March 2023, these banks increased their borrowings, including reaching a peak in their borrowing from the Federal Home Loan Banks, showing their post-crisis liquidity dependence.

BOX 3.2 **(CONTD.)**

Obviously, we need a better understanding of bank behaviour to craft appropriate policy. Liquidity regulation, besides being applied uniformly across banks, may need to become more contingent on aggregate circumstances and more forward-looking (for example, banks could be required/incentivised to maintain a longer duration of deposits, especially during QE). Similarly, capital and liquidity stress tests could factor in higher drawdowns on demandable bank liquidity claims in scenarios of heightened aggregate risk.

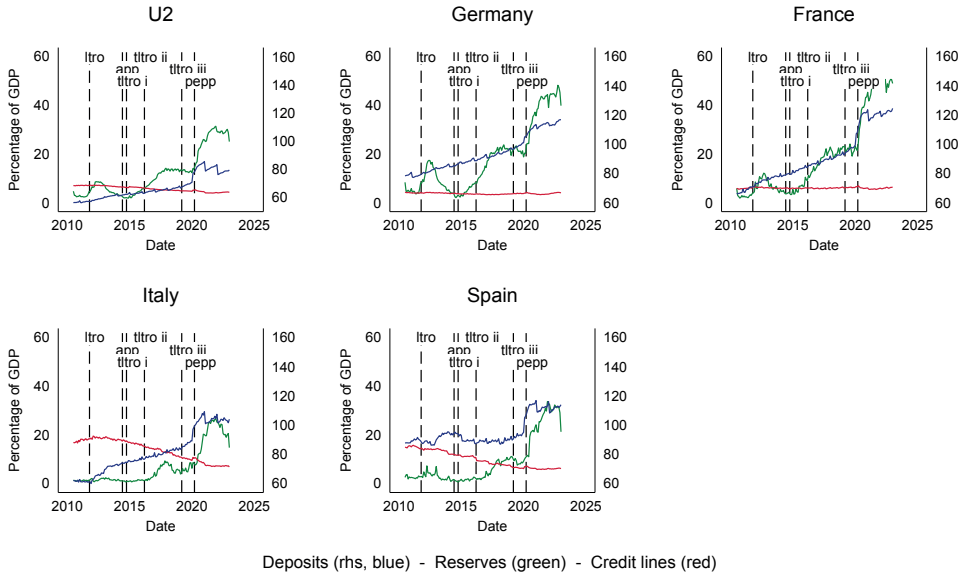
Policy measures aimed at ensuring a relatively unconstrained flow of liquidity between banks would also mitigate liquidity stress and the phenomenon of reserve hoarding by banks with excess reserves.

**The ECB also injected large amounts of liquidity into markets after the GFC**. These injections included the Long-Term-Refinancing Operations (LTRO) started in October 2011, the Asset Purchase Program (APP) started in November 2014, the Targeted Long-Term Operations (TLTRO) introduced on three occasions (April 2015, September 2016, and September 2019), and the Pandemic Emergency Purchase Program (PEPP) started in September 2020. While the LTRO and TLTRO programmes were bank liquidity injections, the APP and PEPP were asset purchases through the ECB, commonly understood as QE.

As of yet, it is not clear whether and how these large liquidity injections might have led to financial fragility in the euro area. To examine this, we use data publicly provided by the ECB Statistical Warehouse and collect data on bank reserves, (time and demand) deposits, as well as bank issued credit lines. Figure 3.6 provides the time-series of reserves, total deposits and credit lines for banks in the euro area (U2) and separately for banks in Germany, France, Italy and Spain to identify possible cross-country differences. The vertical lines correspond to the different ECB liquidity injections.

The figures show that during the sovereign debt crisis, reserves increased in the euro area as a whole and then declined until November 2014 when the ECB started its first QE programme. But there are noticeable differences across countries. The reserve increase in Germany was about 20% of GDP, it was somewhat less pronounced in France, and reserves were almost flat in Italy and Spain. The higher reserves correspond to greater uncertainty (or risk aversion) among lenders about the prospects for the euro area. Banks in Germany and France were unwilling to provide liquidity in the interbank markets to peripheral banks and deposited their excess liquidity with the ECB at low interest rates. Italian and Spanish did not have excess liquidity but were instead dependent on ECB liquidity support. After Mario Draghi's "whatever it takes" speech in July 2012, financial and economic conditions improved, and reserves declined to 2010 levels.

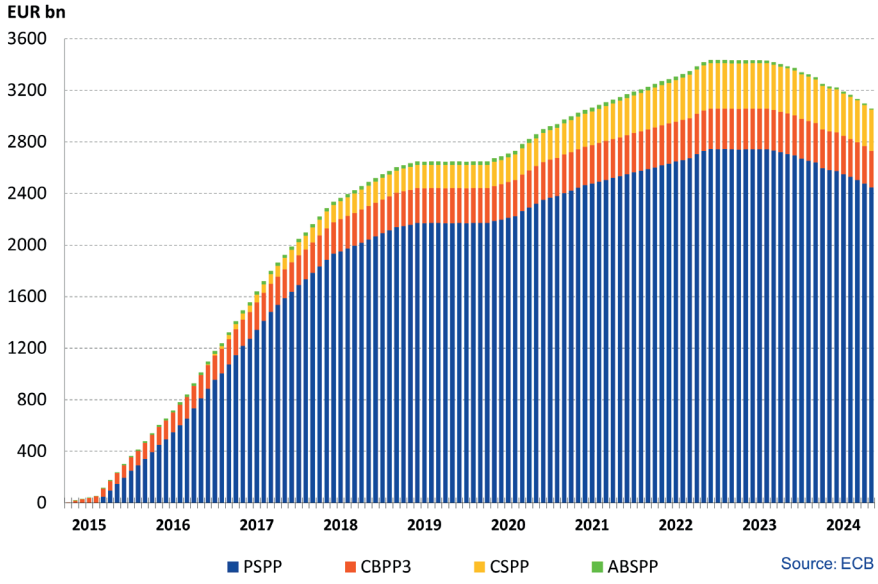
FIGURE 3.6 **TIME-SERIES OF DEPOSITS, RESERVES AND CREDIT LINES**




Source: ECB Statistical Warehouse.

Reserves increased again with the start of the APP in November 2014 until 2018, when the ECB set net asset purchases to zero (Figure 3.7). Reserves continued to increase following the start of the PEPP programme during the pandemic but were unevenly distributed across countries. While reserves increased to more than 40% of GDP in Germany and France, they increased to about 20-30% in Italy and Spain.

FIGURE 3.7 **APP CUMULATIVE NET PURCHASES, BY PROGRAMME**

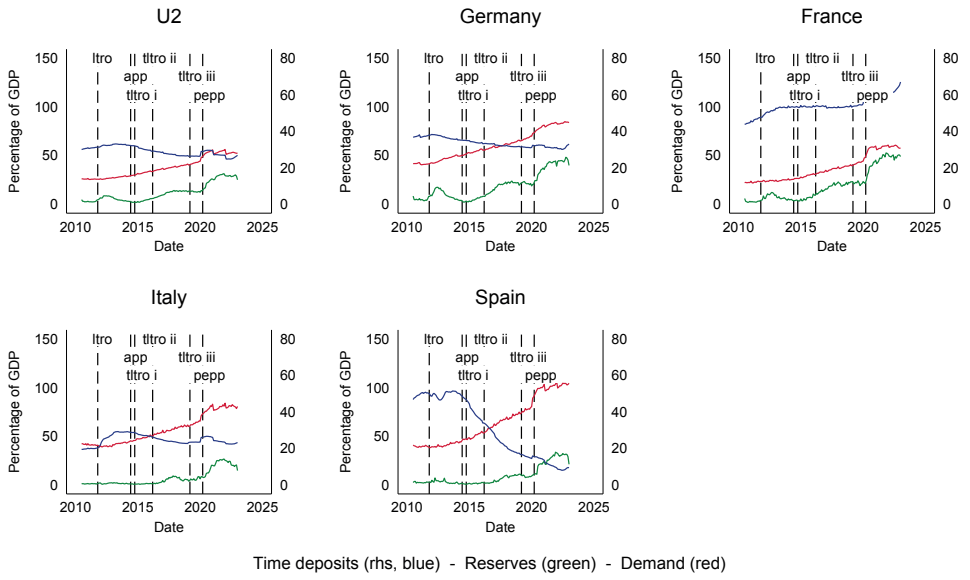



Source: ECB.

**Similar to the United States, there was an increase in deposits at European banks following QE.** On average this was to about 80% of GDP, and in Germany, France, Italy and Spain to about 100-120% of GDP. In contrast to Acharya et al. (2023b), euro area data do not show an increase in credit lines post QE. In fact, credit lines (relative to GDP) even decreased somewhat in some countries following QE or simply remained flat.

As Figure 3.8 shows, during QE episodes, banks increased their demand deposits but, far from rebalancing towards longer maturities, they reduced time deposits, i.e., they lowered the maturity of demandable claims. Public data, unfortunately, do not allow us to differentiate between insured and uninsured deposits.

FIGURE 3.8 **TIME-SERIES OF DEMAND AND TIME DEPOSITS, AND RESERVES**

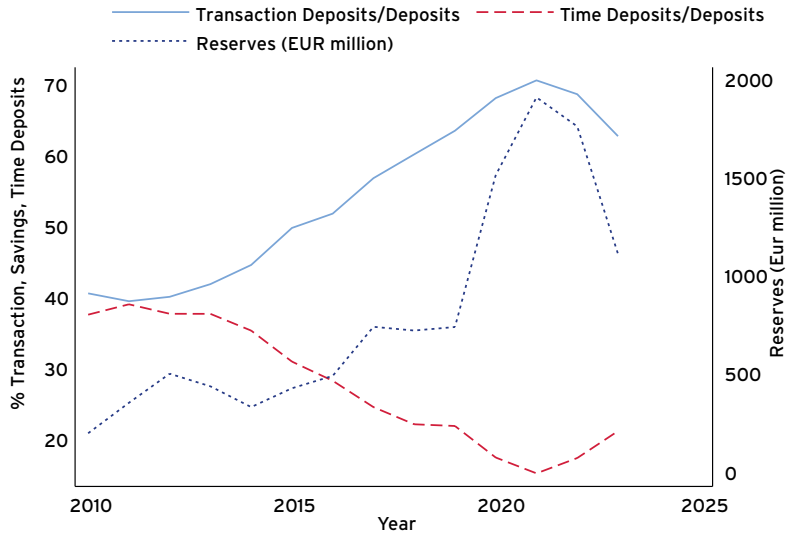



Source: ECB Statistical Warehouse.

Using bank-level data, Figure 3.9a shows, similarly to the aggregate time-series before, less time deposits and more transaction deposits when reserves rise, and thus a lower maturity of deposits.

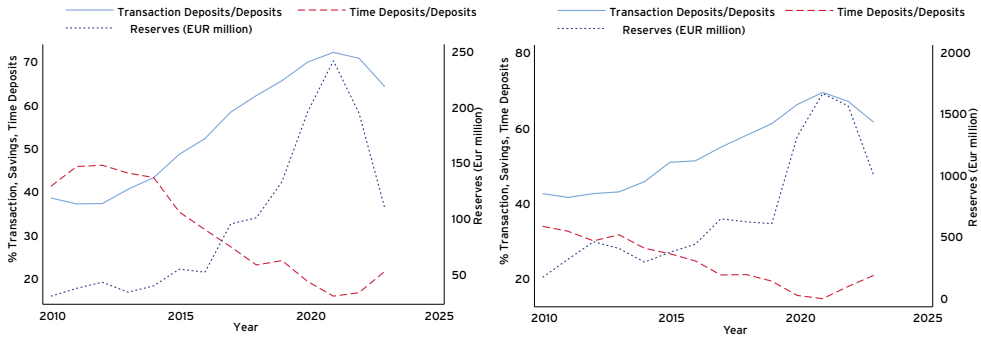
Patterns varied between large and small banks (Figure 3.9b). Consistent with Acharya et al. (2023b), from 2014 to 2021, small banks increased their transaction deposits relative to total deposits from 38% to 72%, while large banks increased this ratio from 46% to 69%. Large banks also reduced their transaction deposits more once reserves decreased. Overall, European banks, and small banks in particular, substantially increased their liquidity risk by shortening the maturity structure of their liabilities.

FIGURE 3.9A **TRANSACTION, SAVINGS AND TIME DEPOSITS OF EUROPEAN SAMPLE BANKS**




Source: Capital IQ, annual reports

FIGURE 3.9B **TRANSACTION, SAVINGS AND TIME DEPOSITS FOR SMALL VERSUS LARGE BANKS**



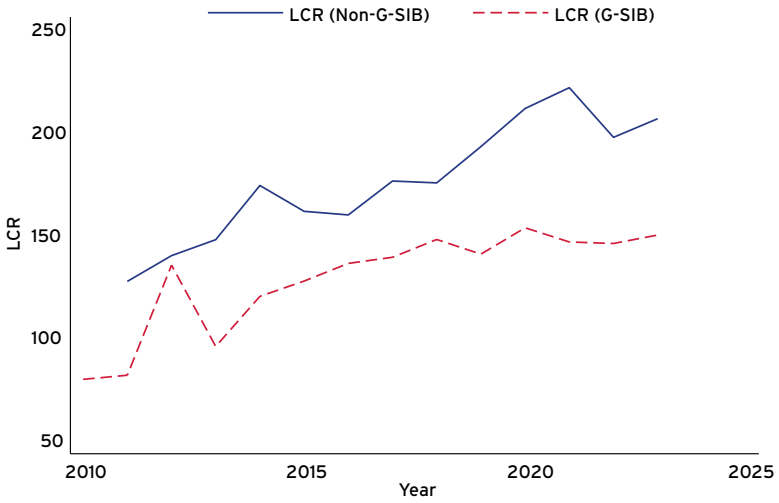

Source: Capital IQ, annual reports

**Developments in bank liquidity on aggregate and for specific groups of banks reflected ECB policies, as was the case in the United States.** After the GFC, new regulations required banks to maintain a minimum level of liquidity through the LCR.[18] Figure 3.10, which plots the LCR time-series for our sample banks over the 2010 to 2023 period, separating G-SIBs and non-G-SIBs, shows that on average, LCRs remained meaningfully above the minimum requirement (of 100). Reserves increased until recently, boosting high-quality liquid assets (HQLA). At the same time, the denominator, possible deposit outflows, increased as banks shifted deposits from time to transaction deposits,

18 The LCR is the ratio of high-quality liquid assets (HQLA) over net outflows over a 30-day period, with HQLA mainly consisting of central bank reserves, liquidity from ECB's Long-Term-Refinancing-Programs (LTRO) and sovereign bonds, while the denominator refers to outflows related to retail and other deposits and other committed facilities, such as credit lines.

which are subject to LCR requirements. However, the shift did not offset the increase in HQLA, and the LCR increased. After 2022, however, the LCR meaningfully declined for both non-G-SIBs and G-SIBs as lower net outflows were only partly offset by lower HQLAs. The decline in net outflows mostly reflected banks shifting retail deposits to time deposits (exempted from the calculation of the outflows), while the decline in HQLA mostly reflected the gradual reduction in excess liquidity by the ECB, since, in addition to the gradual unwinding of APP, banks repaid the ECB a substantial part of their TLTRO loans.[19] On net, this meant lower LCRs.

FIGURE 3.10 **LCR FOR G-SIBS VERSUS NON-G-SIBS**




Overall, as the LCR remained comfortably above 1 for the whole period, the increase and subsequent decrease in transaction deposits appears not to have been driven by LCR requirements being binding or not. This suggests that European banks (particularly small banks) had comfortable short-term liquidity positions, which likely differentiates them from their US counterparts (where smaller banks are additionally not subject to the same liquidity requirements), including explaining the differences in March 2023. While the FDIC Call Reports allow for detailed bank-level analysis of the consequences of QE and QT for individual banks, a lack of bank-level data makes a comparable analysis significantly more difficult in Europe.

**Vulnerabilities explain the stock price performance of European banks during the SVB collapse**. Did these vulnerabilities materialise during the SVB collapse and financial turmoil in March 2023? Figure 3.11 shows that risks spilled over to the European banking system, specifically after the failure of SVB on 8 March 2023. The figure plots the stock

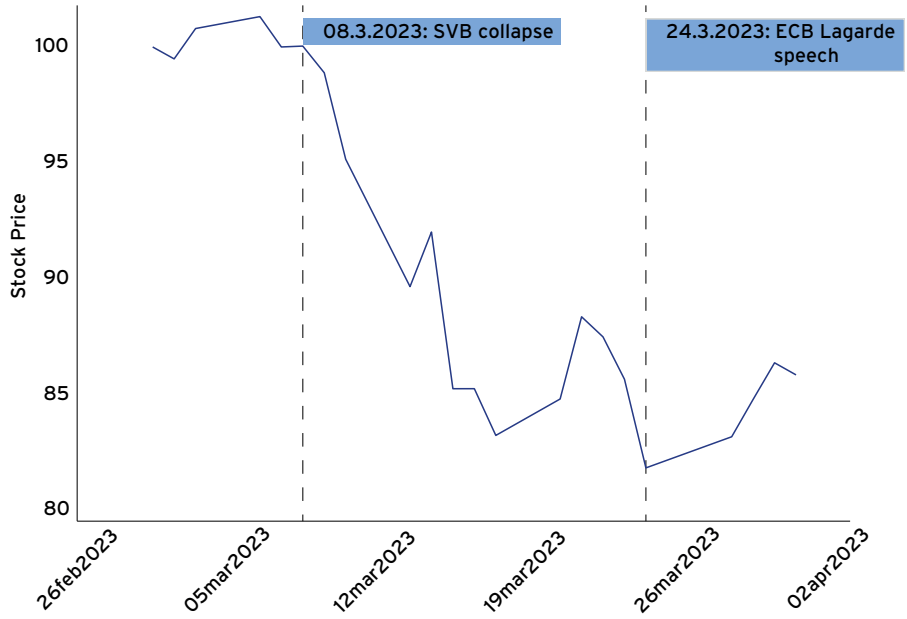
19 These repayments resulted in an average drop in the LCR by -3.55 percentage points for the affected banks. The decline in liquid assets for banks with TLTRO funds was two times higher than for the banks with no such liabilities. At the end of June 2023, euro area banks reported €438 billion in remaining TLTRO balances (EBA, 2024).

prices of European stress test banks and the other European G-SIB banks, indexed to 100 on 1 March 2023. On average, stock prices declined around 20%, reaching their lowest point on 24 March 2023. On that day, ECB President Lagarde made a public statement on the stability of the European banking sector and announced a set of programmes to support the banking system and the economy.





FIGURE 3.11 **STOCK PRICES OF EUROPEAN BANKS DURING THE SVB COLLAPSE**




We next analyse the key drivers of the realised stock returns during the period (Table 3.3). Column (1) shows that banks with a higher deposit leverage ratio (*Deposits/Market Capitalisation*) had lower realised stock returns, showing the markets' concerns over liquidity risks. In column (2) we analyse other important bank risk factors that could explain stock returns. We find that banks with high non-performing loans to total asset ratios as well as less profitable banks (with lower return on average assets (*ROAA*)) had lower stock returns. Controlling for regulatory capital requirement (the bank's ratio of risk-weighted assets to total assets) suggests that banks with more excess capital (measured using the Tier 1 capital ratio) also had lower stock returns.

TABLE 3.3 **UNDERSTANDING REALISED STOCK RETURNS OF EUROPEAN BANKS DURING THE SVB FAILURE (MARCH 2023)**

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Dependent variable: Realised stock return, 1-24 March 2023 | | | | | |
| Deposits/Market Capitalisation | -0.004*** (-3.526) | -0.002 (-1.113) | -0.001 (-0.296) | | | |
| Tier 1 Ratio (%) | | -0.016** (-2.398) | -0.017** (-2.432) | | -0.016** (-2.240) | -0.016** (-2.342) |
| RWA/Total assets | | -0.018 (-0.136) | -0.014 (-0.104) | | 0.002 (0.019) | -0.012 (-0.092) |
| NPL/Total assets | | -4.108** (-2.092) | -4.715** (-2.297) | | -4.164** (-2.214) | -4.804** (-2.381) |
| ROAA (%) | | 0.055** (2.577) | 0.059** (2.593) | | 0.054** (2.447) | 0.061** (2.493) |
| G-SIB | | -0.037 (-1.018) | 0.044 (0.978) | | -0.034 (-0.920) | 0.041 (0.984) |
| GIIPS Bank | | -0.003 (-0.127) | -0.009 (-0.344) | | -0.004 (-0.175) | -0.009 (-0.342) |
| G-SIB=1 # Deposits/ Market Capitalisation | | | -0.005** (-2.232) | | | |
| Deposits / ((1-LRMES) * Market Capitalisation) | | | | -0.002*** (-3.703) | -0.001 (-1.128) | -0.000 (-0.117) |
| G-SIB=1 # Deposits/ ((1-LRMES) * Market Capitalization) | | | | | | -0.003** (-2.294) |
| Constant | -0.144*** (-9.297) | 0.121 (0.860) | 0.121 (0.849) | -0.144*** (-9.549) | 0.106 (0.719) | 0.110 (0.759) |
| $R^2$ | 0.2270 | 0.4793 | 0.5128 | 0.2431 | 0.4808 | 0.5176 |
| N | 41 | 35 | 35 | 41 | 35 | 35 |

Notes: Deposits are total customer deposits; Market Capitalisation is the bank market value (share price times number of shares outstanding); Tier 1 Ratio (%) is a bank's Tier 1 capital divided by risk-weighted assets; RWA / Total Assets is the bank's risk-weighted assets over total assets; NPL/Total Assets is non-performing loans over total assets; G-SIB is a dummy equal to one if a bank is a G-SIB. GIIPS Bank is a dummy equal to one if a bank is from Greece, Italy, Ireland, Spain or Portugal; LRMES is the Long-Run Marginal Expected Shortfall, the expected fractional loss of the firm equity when the MSCI World Index declines significantly in a six-month period. It is calculated as 1-exp(log(1-d)*beta), where d is the six-month crisis threshold for the market index decline and its default value is 40%; and beta is the firm's Dynamic Conditional Beta. LRMES is sourced from NYU's Volatility Lab, all other data from Bloomberg and Capital IQ. All publicly listed banks from the EBA stress test are included as well as the other European G-SIBs. Data as of 31 December 2022.

In column (3), we interact the *G-SIB* dummy with *Deposits/Market Capitalisation* and find in particular that G-SIBs performed worse when they had high deposit leverage.[20] Interestingly, the dummy variable *GIIPS Banks*, which is for banks headquartered in Greece, Italy, Ireland, Portugal or Spain, does not load significantly on stock returns. The traditionally high exposure of these banks to arguably riskier sovereign debt does not seem to be priced into stock returns during this period. We turn to the question of whether that means that sovereign risk is 'dormant' or that markets are no longer worried about sovereign–bank linkages in these countries in the next subsection.

In columns (4) to (6), we use a stressed deposit leverage ratio (measured as *Deposits*/[(1-*LRMES*) x *Market Capitalisation*], i.e. the deposit leverage of the bank if a stress scenario materialises (measured as of 31 December 2022). Consistent with the above, banks with higher stressed deposit leverage ratios also had lower stock returns during the SVB failure. The explanatory power of the test even improves when using the stressed (rather than the unstressed) measure for deposit leverage.

### 3.1.4 Sovereign–bank linkages: Dormant, for now?

Starting in 2008-2009, and accelerating with the sovereign debt crisis in 2011, European capital markets became increasingly fragmented, and notably so government bond markets. Large public sector debts – in part due to financial bailouts and recovery programmes – sparked doubts about the ability of some countries to repay. Yield spreads of peripheral countries (GIIPS: Greece, Italy, Ireland, Portugal and Spain) to German bunds widened and investors retrenched to their home market (Figure 3.12a plots the 10-year sovereign bond yields of Italy, Germany and Spain and 3.12b the difference between Italian and Spanish yields and that on German bunds). At the core of stresses were the 'home bias' in banks' bond holdings and the 'doom loop' between sovereign and financial sector credit risk. As domestic banks increased exposures to their government and sovereign credit risk heightened, concerns resurfaced about banks solvency, which further stressed sovereign bond markets, causing sovereign and bank credit default swap (CDS) spreads to move in lockstep.

20 We also included the LCR in unreported tests. As the ratio was not reported for all banks, the number of observations dropped to 30. Consistent with our previous analysis, LCR does not explain significantly stock returns during this period. We also do not find a significant differential effect between G-SIBs and non-G-SIBs.

FIGURE 3.12A **10-YEAR SOVEREIGN BOND YIELDS**

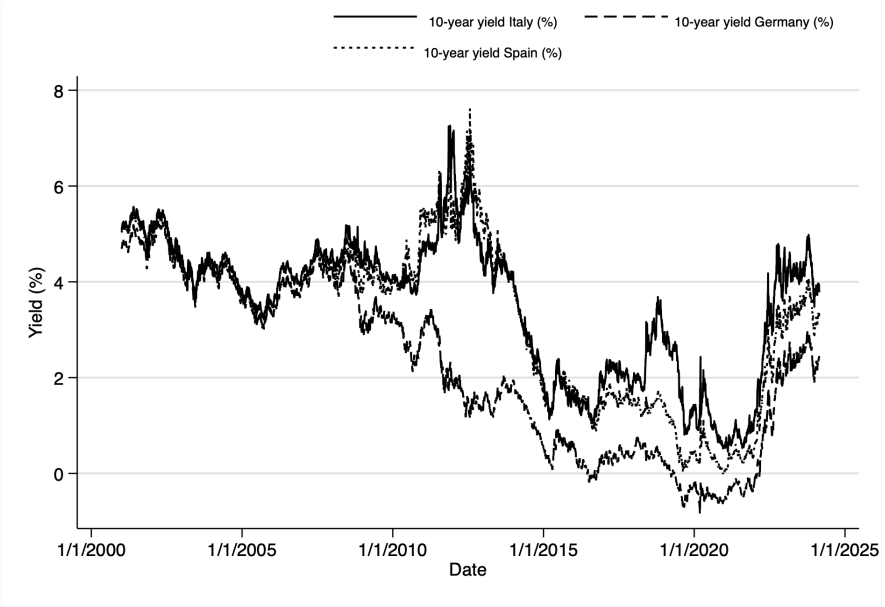
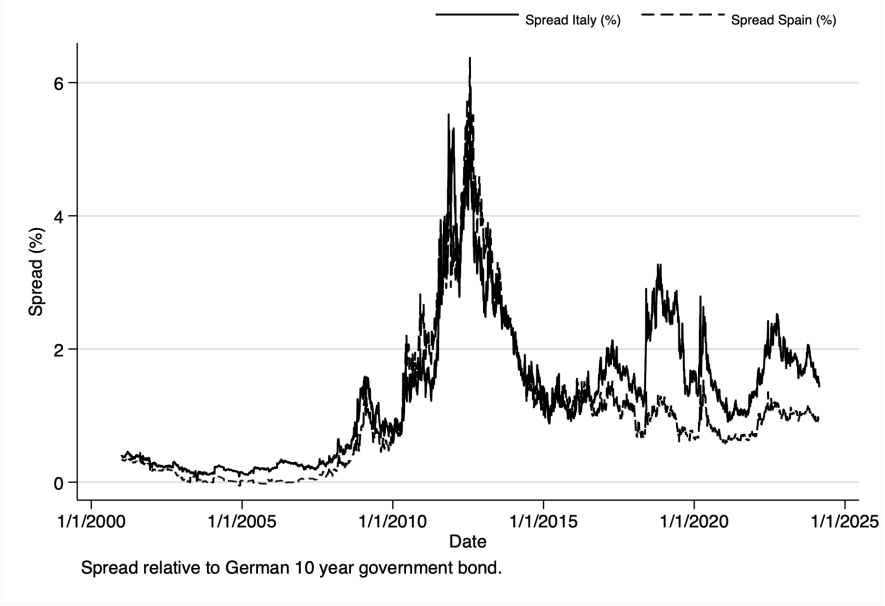



FIGURE 3.12B **SPREAD DIFFERENCES TO GERMANY BUNDS**




Source: Bloomberg.

As GIIPS banks had increased their home sovereign exposures significantly after the GFC while also shortening the maturity of their liabilities (Acharya and Steffen, 2015),[21] when spreads widened further, banks lost on both sides of this 'carry trade'.[22] After significantly increasing between 2010 and 2012, sovereign spreads dropped sharply following Mario Draghi's "whatever it takes" speech (Acharya et al., 2019). Since then, in part due to the ECB's government bond purchases (tilted towards GIIPS), spreads declined further. But Spanish spreads remained around 1% and Italian spreads around 2%, reflecting continued political and fiscal concerns. In the last 12 months, spreads have declined as yields overall have increased and economic conditions converged, and are currently below 2%. The exposures leading to the doom loop have declined but remain significant. Using quarterly data from the EBA transparency exercise, Figure 3.13a shows that between 2018 Q1 and 2023 Q1, the home bias – defined as domestic sovereign bond holdings as a share of total sovereign holdings – of non-GIIPS banks was relatively constant below 50%, while it declined for the GIIPS banks by about 10 percentage points to around 65%. For the Italian banks (panel b) home bias is now below 75%, and it is 77% for Spanish banks. But the exposure of GIIPS banks to all GIIPS sovereign bonds remains high at about 90%, whereas non-GIIPS banks' exposure to GIIPS sovereign bonds is just 10%.

Recently, even though the ECB started QT, risk spreads of GIIPS have declined markedly, more than seemingly justified by improved economic and fiscal prospects. The launch of the NewGenerationEU programme may have led markets to conclude that EU fiscal solidarity has structurally increased. This remains to be seen. With the sovereign bond market still fragmented and fewer or no ECB purchases of sovereign bonds, spreads might once again diverge and challenge European banks' stability.

Using the sample of stress test banks (and the reported sovereign bond exposures) as well as bank and sovereign CDS spreads, we investigated a possible re-emergence of the doom loop when interest rates had increased. Covering a sample of 14 countries (besides most euro area countries, also the United Kingdom, Denmark and Switzerland) and 68 banks (of which 34 with CDS information), and using Acharya et al. (2015) as the empirical framework, at the time of writing this report, there was no evidence of the re-emergence of a doom loop among European countries. Sovereign CDS spreads, however, price country-specific risks, notably the high domestic sovereign bond exposures, implying significant doom-loop risks remain.[23]

21 Acharya et al. (2021a) show that a lack of recapitalisation of European banks after the GFC provided incentives for banks to increase their sovereign bond exposures.

22 Banks can tilt their sovereign bond portfolios to domestic bonds for different reasons: (1) moral hazard of risky banks (Acharya and Steffen, 2015); (2) financial repression (Becker and Ivashina, 2018); (3) the positive correlation of sovereign bond returns with other sources of weak banks' revenues (Crosignani, 2021); or (4) better hedging against redenomination risk (Battistini et al., 2014).

23 Much evidence shows that the sovereign bond market problems spilled over to other markets and impaired bank intermediation activity. Heider et al. (2015) and Frutos et al. (2016) document segmentation in the interbank market due to asymmetric information about bank credit risk (e.g., because of sovereign bond exposures). Acharya et al. (2019) show that loan spreads charged by banks depend on bank risk. Popov and van Horen (2015) show that non-GIIPS banks with large GIIPS exposures reduced syndicated lending relative to non-exposed banks and increased home bias in loan portfolios. Similar evidence is provided by De Marco (2016) and Bofondi et al. (2013).

FIGURE 3.13A **HOME-BIAS OF GIIPS VERSUS NON-GIIPS BANKS**

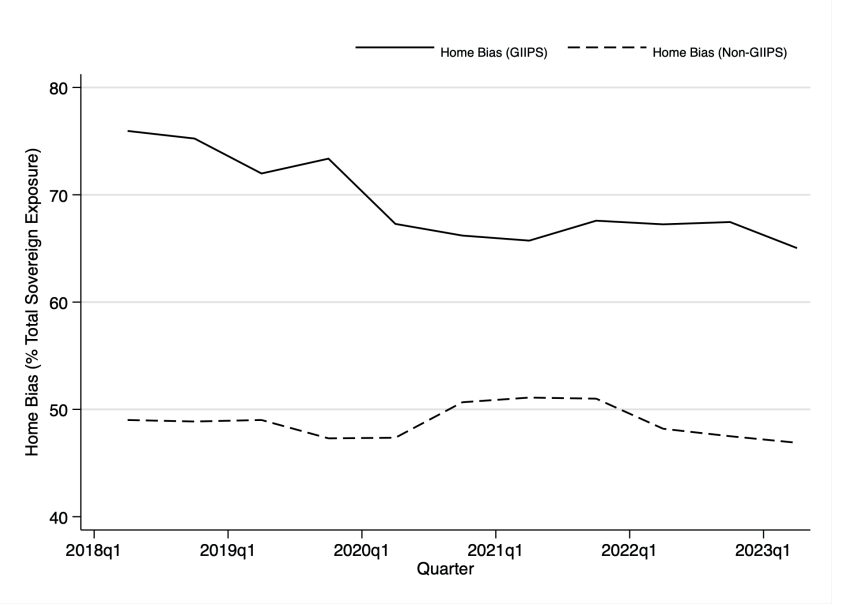
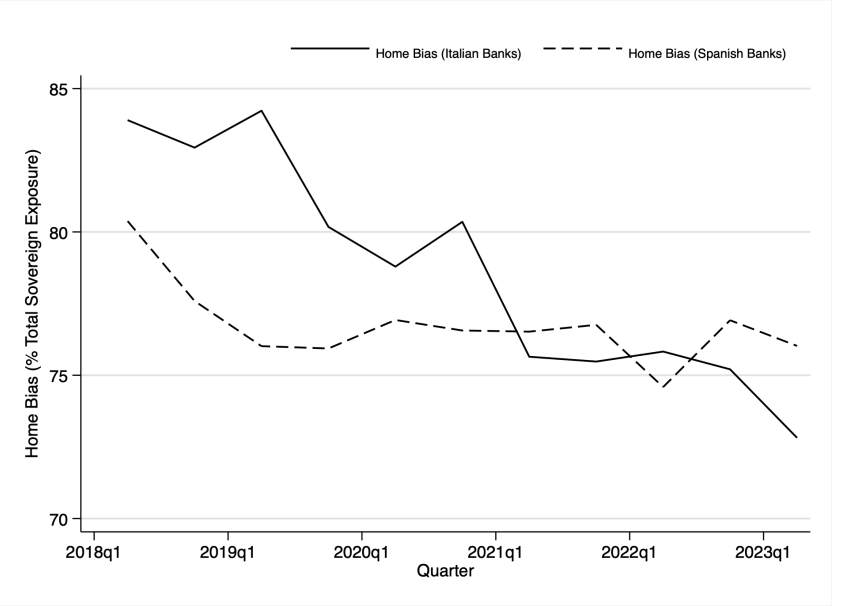



FIGURE 3.13B **ITALIAN AND SPANISH BANKS**




Source: EBA Transparency Exercise (2023).

### 3.1.5 Other known and newly emerging risks

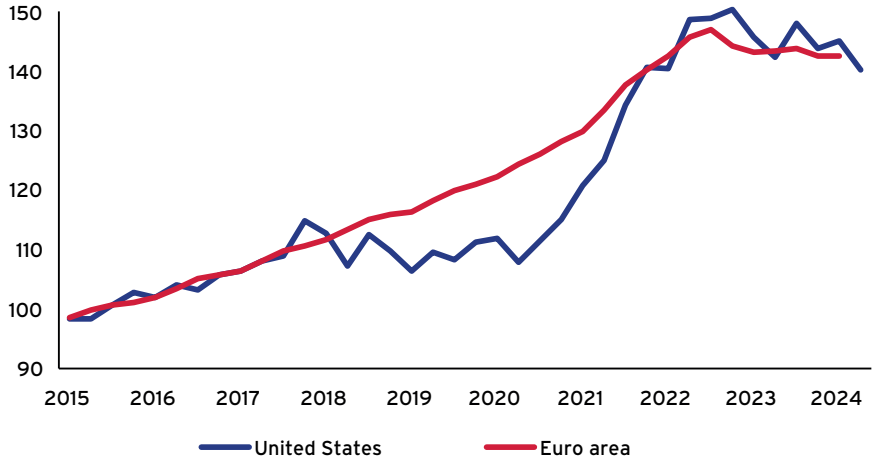
There are numerous other risks that can threaten European banks, ranging from interest rate risks to exposures to adverse real estate developments, a weaker global economy, as well as climate change. These, and other vulnerabilities, can add to the one analysed above to create a 'perfect storm'. Since many of these are well-known and included in EBA and other stress tests, as well in financial stability reviews (e.g., ECB, 2023), here we just discuss two: real estate and exposure to a China slowdown.

*Real estate blues*

After years of tailwinds from 'low for long' interest rates, real estate markets were hit by higher interest rates in 2022. The interest rate sensitivity of residential real estate (RRE) is well-known: house prices responded powerfully to the higher rates in both the United States and the euro area, although with a lower lower volatility on this side of the Atlantic (see Figure 3.14). Overall, the decline in house prices in the euro area is largely expected to have a macroeconomic drag, reinforcing the policy stance, but is not expected to lead to major financial stability risks, as repayment risks are small. Commercial real estate (CRE) differs. The reduced demand for office space after the pandemic, likely largely permanent, is hitting CRE hard. A recent ECB survey (ECB, 2023) reports that about 80% of experts expect a downturn going forward. While exposure of euro area banks is mostly to RRE and much lower than at the time of the GFC, it is still significant at close to 40%. Risks thus remain and losses could amplify other shocks.

FIGURE 3.14 **RESIDENTIAL REAL ESTATE PRICES: UNITED STATES VS EURO AREA**

Indices 2015=100




Source: FRED (https://fred.stlouisfed.org) and BIS.

*Effects of a possible China collapse*

Views on what a potential crisis in China, stemming from financial imbalances built up, may imply for the euro area vary. Policymakers often refer to the limited direct exposure of euro area banks to Chinese banks and other real estate entities. But indirect exposures are likely more important, and a crisis in China could significantly reduce exports from Europe. Furthermore, geopolitical tensions, the occurrence and implications of which are hard to predict, could affect imports from China.

A 2024 Deutsche Bundesbank report examines such dependences on China for the German economy, also considering second-round effects. Model simulations suggest that a slowdown of the Chinese economy (calibrated on historical experiences, excluding trade interruptions caused by geo-political tensions) would lower German GDP by 0.7 percentage points relative to the baseline. Further restrictions on German imports due to geopolitical factors (e.g., sanctions) would cause major production losses in German industries. Combining these results with other data suggests that the direct and indirect knock-on effects of such an export decline could amount to close to half of German banks' high-quality capital. Exposure is relatively higher for mid-sized banks, the financial backbone of the German *Mittelstand*.

The impact of such a shock on the broader euro area is likely lower, as Germany depends more on exports to China than the euro area on average. The European Commission's latest economic forecast (European Commission, 2023b), assuming a slowdown of China of comparable magnitude, points to a euro area effect of about 0.3 percentage points, consistent with the euro area's 'direct' exposure being about half that of Germany (for example, FDI investments are about three times those of Germany, similar to relative GDPs; see The Economist, 2023). But the links between Germany and the rest of the euro area are strong, with European value chains highly integrated, suggesting that the euro area impact may still be large enough to justify concern.

## 3.2 THE US BANKING SYSTEM: LESSONS FROM SVB'S COLLAPSE AND BEYOND

This section spells out the problems that became known around the failure of Silicon Valley Bank and discusses the broader policy lessons that emerged. First, it uses data to describe the core problem in what happened to SVB and to other banks during the recent monetary tightening cycle. Then it describes what might be a short-term diagnosis and solution before discussing the long-term solution to the problem.

### 3.2.1 Failures and some historical perspective

There have been several distinct episodes of failures in the US banking system over the past two decades or so. The financial crisis in 2007 saw many large bank failures, largely driven by credit risk the banks undertook (e.g., Washington Mutual). This was followed by a period of mainly small bank failures, more than 500 from 2008 through 2014, and

very few failures between 2015 and the end of 2022. More recently, the turbulence in the banking sector started in mid-March of 2023 with the failure of SVB. At the time of its failure, the rhetoric was that SVB might have been unique in why it failed. In what follows, we will argue that SVB's problems were not unique but are also present in many other US banks, because SVB and other banks took high interest rate risks and because they had a sizable proportion of uninsured debt (depositors) in their funding structure.



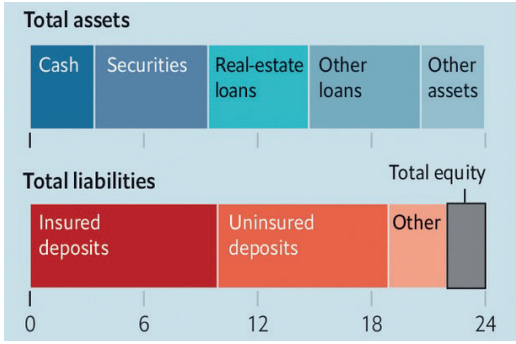


### 3.2.2 Uninsured leverage and the US banking system[24]

Uninsured leverage, which represents the amount of uninsured debt in the capital structure of a bank, has important implications for financial stability of banks. Uninsured depositors are more sensitive to information than insured debt, making them more 'run-prone'. Thus, for a bank that has a lot of uninsured leverage, small negative shocks to the value of its assets – given the substantial leverage of banks (Jiang et al., 2020) – could lead to fragility due to more run-prone debt in its financing structure. In the case of SVB, this decline in value of assets occurred due to an increase in interest rates between 2022 Q1 and 2023 Q1. We could ask what the increase in interest rates did for the market value of assets for the other 4,800 banks in the US banking system at the time of SVB's collapse. We could then assess what this decline in assets might mean for the banks' solvency, given the structure of their liabilities. This is indeed an exercise we did in Jiang et al. (2023a) and one that we will extend in this chapter.

As a starting point, it is useful to describe the entire US banking system before monetary tightening. The system had $24 trillion of assets held in securities, loans, and other assets (see Figure 3.15). On the liability side, there were $9 trillion of insured deposits and $9 trillion of uninsured deposits.[25] There was also $2 trillion in equity capital in the aggregate banking sector. The current configuration is similar.

FIGURE 3.15 **BETWEEN THE BALANCE SHEETS: THE AGGREGATE BALANCE SHEET OF US BANKS AS OF 2022 Q1 (US$ TRILLIONS)**




Source: Jiang et al. (2023a).

24 What follows relies heavily on work of Amit Seru with his frequent collaborators (Erica Jiang, Gregor Matvos, and Tomasz Piskorski), who have been extensively studying the structure of bank liabilities – in particular, the uninsured leverage of banks – for some time (Jiang et al., 2020).

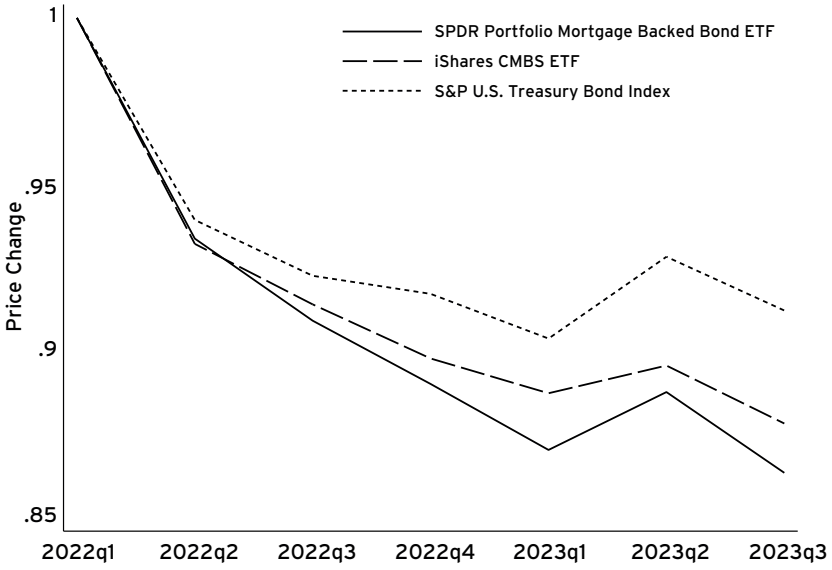
25 Note that by mid-May 2023, uninsured deposits had decreased to $7 trillion. As might be expected, some runnable uninsured deposits left the banking system during the recent turbulence in the banking sector.

### 3.2.3 Marked-to-market losses across banks

We use US bank call report data and assess the marked-to-market losses over the monetary tightening from 2022 Q1 to 2023 Q1 for different banks. In doing this exercise, we not only marked to market the securities owned by banks – that includes Treasuries and the other liquid securities like agency residential mortgage-backed securities (RMBS) – but also their loan portfolios. Notably, we use the information on the detailed maturity structure for the loans in call reports. When we did this marking to market, we found the banking system to have about $2 trillion of unrealised losses due to the monetary tightening.

Two issues are worth emphasising. First, this marking-to-market exercise involves a substantial proportion of liquid securities (such as Treasuries and Agency MBS). These are different than what is typically considered to be the long-term illiquid assets that banks might specialise in intermediating. But these safe and liquid securities all went down in market value when interest rates rose over the last year. As we can see in Figure 3.16, between 2022 Q1 and 2023 Q1, during which the Federal Funds Rate increased from 0.2% to 5.00%, the market price of US treasuries and RMBS decreased sharply. Notably, as can be seen, the Federal Funds Rate further increased after that time (to around 5.33% at the end of 2023 Q3). This has implications built up losses in the banking system and for policy, as we will discuss later.

FIGURE 3.16 **MARKET PRICE OF THE PORTFOLIO OF RESIDENTIAL MORTGAGE-BACKED SECURITIES, COMMERCIAL MORTGAGE-BACKED SECURITIES, AND US TREASURIES RELATIVE TO THEIR VALUES IN 2022 Q1**




Note: Normalised to one. We plot the prices from 2022 Q1 till 2023 Q3.

Source: Jiang et al. (2023a) and author calculations.

Second, large unrealised marked-to-market losses do not mean that the bank will face a run. A large literature (e.g., Drechsler et al., 2017; Egan et al., 2017) argues that banks possess franchise value due to market power over depositors. What this implies is that depositors may not care about unrealised losses that might have accumulated on a bank's asset side. Consequently, the unrealised losses may not translate into realised losses for the bank; that would occur only if enough depositors lined up to withdraw their funds, forcing the banks to liquidate some of their assets. This literature by and large assumes that uninsured depositors are as 'sticky' as insured depositors, which, as the SVB collapse shows, may not be a reasonable assumption when losses become large enough. We will return to this issue.





### 3.2.4 Commercial real estate losses

So far, we have only discussed the direct impact of an increase in interest rates on the banks' asset side. An additional factor that may also adversely impact the assets of some banks relates to the credit risk of CRE loans. These account for about a quarter of assets for an average bank, and about $2.7 trillion of bank assets in the aggregate (Jiang et al., 2023c). Property values have faced significant downward pressure as interest rates have increased. In addition, post-COVID-19, hybrid working patterns and a movement away from the centres of cities (with office buildings and shopping malls) to less densely populated suburban areas have put pressures on CRE loans. All of these forces imply that 14% of all CRE loans and 44% of office loans face 'negative equity' (i.e., the current property values are less than the outstanding loan balances). Moreover, the maturity structure of many CRE borrowers makes it clear that they would face challenges to meet their obligations as rates will be higher when their CRE loans are refinanced. We estimate potential CRE loan defaults of 10% due to all of these factors, conservative by historical standards, which would mean banks incurring about an additional $80 billion of losses (Seru, 2023c). What is important to note here is that some regional banks in the United States specialise in CRE loans. Thus, these losses would impact some medium-sized banks disproportionately.

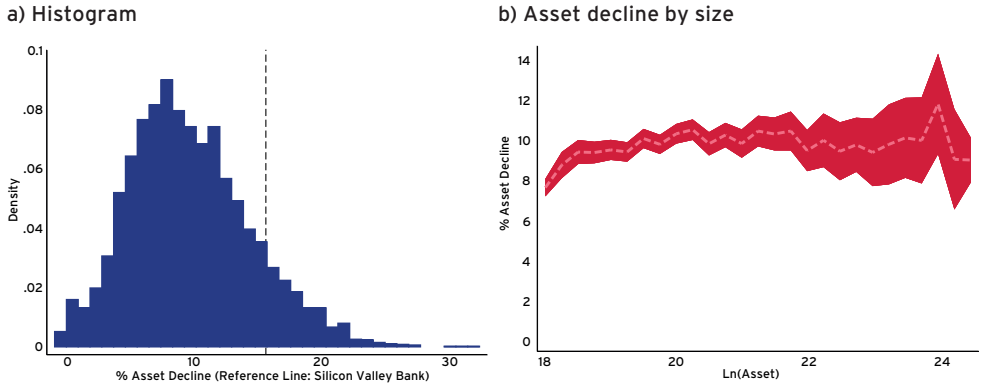
Note that even without the possible losses on CRE loans, our marked-to-market exercise alone reveals losses of more than $2 trillion across the banking system (with about 60% of these losses on securities and the rest on loan portfolios). Recall that the aggregate equity in the banking system is of similar magnitude. The losses, when compared with equity, tell us that there might be a quite a few banks that could be underwater on a marked-to-market basis. We now elaborate on these losses across the banking sector and discuss what they might imply for the equity value of banks on a marked-to-market basis.

Figure 3.17a plots the distribution of losses across the 4,800 banks in the US system. The average loss across the banking system is around 10% (about $2 trillion on $24 trillion). The vertical line depicts where SVB was in terms of its marked-to-market losses. The figure shows that SVB was not an outlier just because it had huge marked-to-market

losses; there are another 500 banks that had similar or larger losses than SVB. Figure 3.17b shows how the losses were spread across the size distribution (with banks put into size bins) in the banking sector. As is evident, banks across the size distribution faced substantial losses on the asset side. Thus, this is not just a small bank phenomenon.

However, we did not see 500 banks facing a run (of course, before the government interventions, which provided large support and made it difficult to assess such risks ex post). Why didn't all the banks face a run at that time (or even earlier)? As we have discussed, part of the answer could be the franchise value of deposits that might lead to depositors not withdrawing their funds even when banks face large unrealised losses. In addition, banks may have engaged in interest rate hedging, which would have dampened the marked-to-market losses that they might have been facing. We turn to this issue next.

FIGURE 3.17 **DISTRIBUTION OF UNREALISED LOSSES IN THE BANKING SYSTEM**




Note: This figure plots the histograms (density) of the percentage of a bank's asset value decline when assets are marked-to-market according to market price growth from 2022 Q1 to 2023 Q1 (panel a), as well as bank asset value decline by bank size (Panel b). The reference line in panel (a) indicates SVB's asset value decline. SVB's asset value declines by 15.7%, or $34 billion, after their assets are marked to market. The reference line is at 89th percentile. The 5th, 25th, median, 75th, and 95th percentiles in panel (a) are 4%, 6%, 9%, 13%, and 19%, respectively. In panel (b), the x-axis is asset value in log terms.

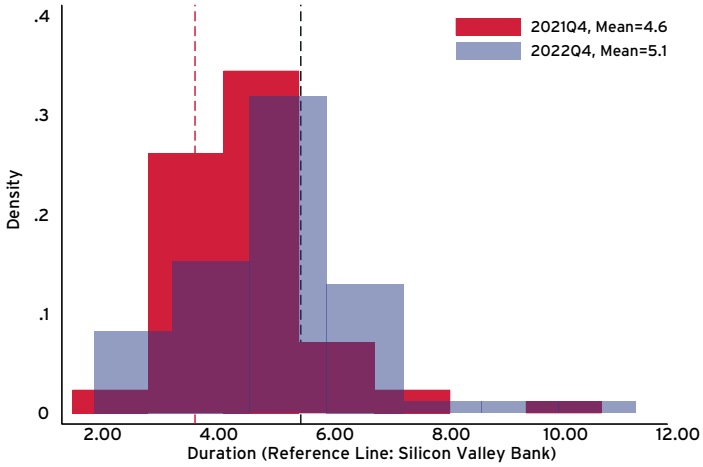
Source: Jiang et al. (2023a) and author calculations.

### 3.2.5 Interest rate hedging

We start by digging deeper into the issue of how much interest rate hedging banks undertook before the monetary tightening. Figure 3.18 plots the duration of bank's assets accounting for its hedging. The orange distribution depicts the duration of bank assets before the monetary tightening and the black distribution depicts the duration of assets during the early part of the monetary tightening, 2022 Q4. In this plot, we restrict attention to banks that report this statistic (some of the largest public banks) in their annual 10-K reports.

FIGURE 3.18 **NOT AS MUCH INTEREST RATE HEDGING IN THE BANKING SECTOR AS YOU WOULD THINK**

Duration of assets for banks that report these in their disclosures



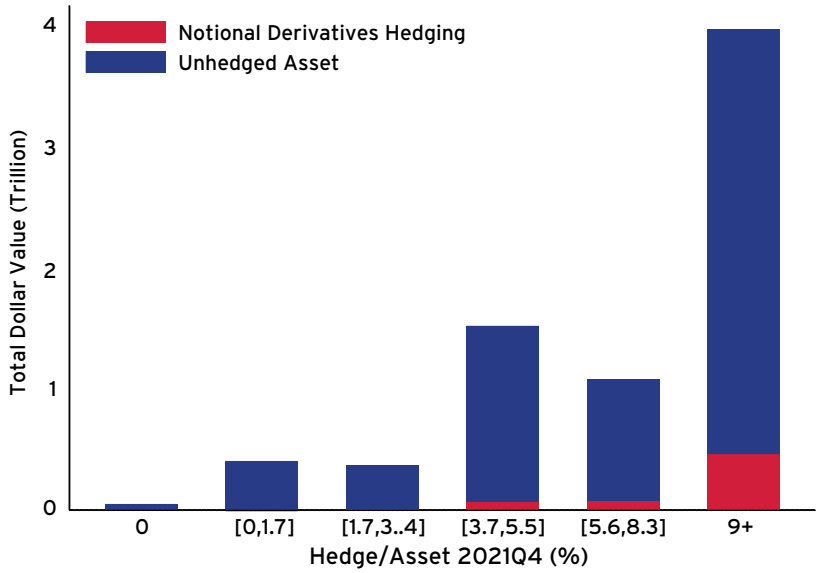

Source: Jiang et al. (2023b).

As is evident, banks that report these data show on average a duration of four or five years after hedging. This is the case both before and after monetary tightening. If anything, during monetary tightening some banks seem to have hedged less. Note that if banks had engaged in substantial interest rate hedging one should have observed a duration closer to zero. Thus, there is a lot of interest rate risk that resides with banks.

We dig deeper into this issue using other data. Using the data from 10-K and 10-Q filings for publicly traded banks in 2021 Q4, we find that only 290 out of 1,271 banks reported using interest rate swaps for risk hedging, most of which are large banks (Jiang et al., 2023b). As Figure 3.19 illustrates, even for banks with a high hedge ratio (over 9%), most of their securities, loans and other assets remain unhedged. Among all banks that reported hedging, banks with less than $250 billion in assets hedge about only 5% of their total assets. Larger banks with over $250 billion in assets hedge about 9% of their total assets or 30% of their securities. As a result, about 94% of total US bank assets were not hedged before the monetary tightening. Even if we focus only on securities (and ignore marked-to-market value declines in loans), the interest rate swaps banks held would only account for 20-25% of the mark-to-market loss in securities. Thus, hedging would be insufficient to protect banks from asset value decline due to an increase in interest rates.[26]

26 Finally, note that there is also limited evidence that riskier banks hedged more of their assets at the end of 2021. If anything, as the interest rise unfolded, riskier banks actually decreased their hedging. For example, SVB hedged about 12% of its securities holding at the end of 2021. Within only one year, SVB sold hedges that increased in value to record accounting profits. As a trade-off, SVB decreased the securities hedge ratio to 0.4%, increasing the duration of assets they held by almost two years, making itself more fragile to interest rate risk. It is worth emphasising that, just as with marked-to-market asset losses, SVB is not an exception on this either: over a quarter of publicly traded banks that held hedging derivatives reduced their hedging ratios. Those banks with lower hedging ratios experienced the largest decline in their hedging, reducing their assets covered by hedging by 3% between 2021 Q4 to 2022 Q4.

FIGURE 3.19 **HEDGED AND UNHEDGED ASSET VALUES BASED ON 2021 Q4 10-KS AND 10-QS**

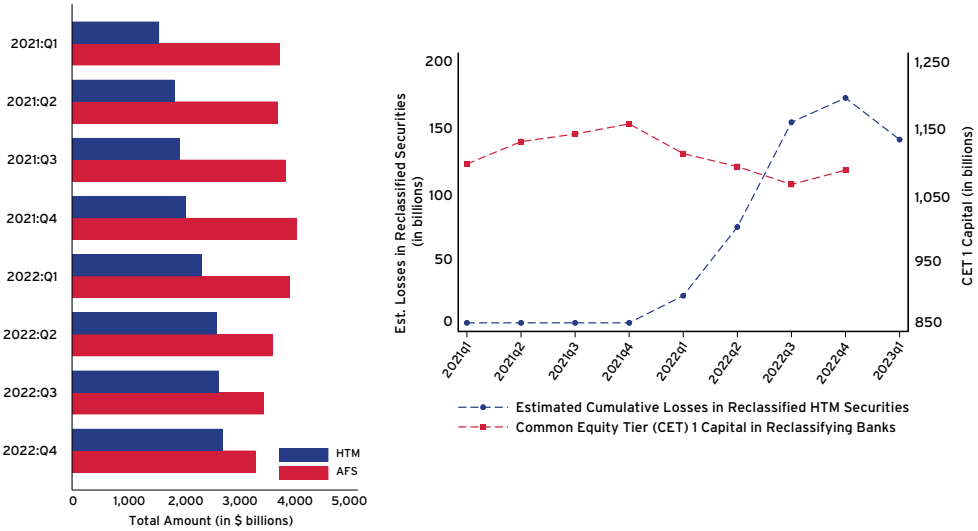



Note: The red bars indicate the notional value of hedges of all banks in each hedging ratio bucket. The black bars indicate the total unhedged asset value of all banks in each hedging ratio bucket, where unhedged asset value is calculated as total assets minus the notional value of the hedge. The first bucket includes banks with zero notional value of hedge, and the remaining hedging ratio buckets are constructed by dividing banks with non-zero hedging into five equal-sized groups based on their notional value of hedge to total asset ratio in 2021 Q4.

Source: Jiang et al. (2023b).

One might wonder why such high unrealised losses (with a high share of lossed on liquid securities) were not reported prominently in financial statements and disclosed by banks. In fact, banks avoided recording their mark-to-market loss on the balance sheet and income statement by reclassifying almost $1 trillion of their available-for-sale (AFS) securities holdings to held-to-maturity (HTM). Under the current account rules, banks can do this if they commit to keeping these securities on their books. At the beginning of 2022, about one-third of the $6 trillion securities held by banks were categorised under HTM. However, 12 months later, with total securities holding almost unchanged, about 45% were valued using HTM. As shown in the left panel of Figure 3.20, there was a gradual increase in the amount of HTM securities in US banks, while securities under AFS decreased over time. The right panel shows that by transferring almost $1 trillion of their securities from AFS to HTM, banks avoided recognising $175 billion in losses in 2022 Q4. Without this reclassification, the loss would reduce over 15% of capital in those banks. For more than 10% of reclassifying banks, the loss would represent over half of their CET1 capital.

FIGURE 3.20 **BREAKDOWN OF TOTAL SECURITIES BETWEEN HTM AND AFS BETWEEN 2021 Q1 AND 2022 Q4 (LEFT PANEL) AND ESTIMATED LOSSES ON RECLASSIFIED SECURITIES (RIGHT PANEL)**




Note: The blue line shows the time series of the estimated cumulative losses on reclassified HTM securities. The red line shows the Common Equity Tier 1 (CET1) capital of banks that reclassified their securities.

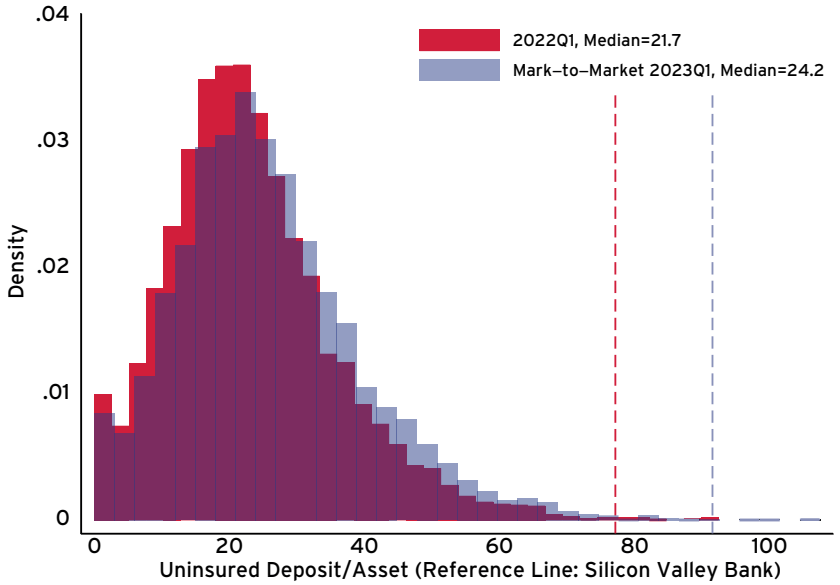
Source: Granja et al. (2023).

### 3.2.6 The role of uninsured leverage

As discussed above, many banks had losses that were similar to or larger than those of SVB. So why did we see a run in the case of SVB? And what does it tell us about the solvency of other banks? The answer lies with the uninsured leverage of a bank. Figure 3.21 depicts the distribution of 'uninsured leverage' (Jiang et al., 2020) in the banking system both before and after monetary tightening. The vertical line shows where SVB is in the distribution. SVB stands out because it had extremely high uninsured leverage in both the distributions. In fact, it was in the top percentile of banks in terms of uninsured leverage.

As noted before, uninsured depositors are sensitive to information and have the highest incentives among depositors to monitor the health of the bank. But when do such depositors run in the presence of unrealised losses on the asset side? Basically, when there are substantive unrealised losses on the asset side such that when enough uninsured depositors line up to withdraw from a bank, the bank is forced to liquidate its assets. Doing so turns unrealised (marked-to-market) losses into realised losses, thereby creating a possible 'solvency run' equilibrium. This scenario does not have to be realised. One could imagine a world where we end up with a 'no-run' equilibrium where, despite large unrealised losses, uninsured depositors do not run because other uninsured depositors would not run. That is, depending on the beliefs of the uninsured depositors, multiple equilibria can exist (Jiang et al., 2023a).

FIGURE 3.21 **DISTRIBUTION OF UNINSURED LEVERAGE ACROSS US BANKS**

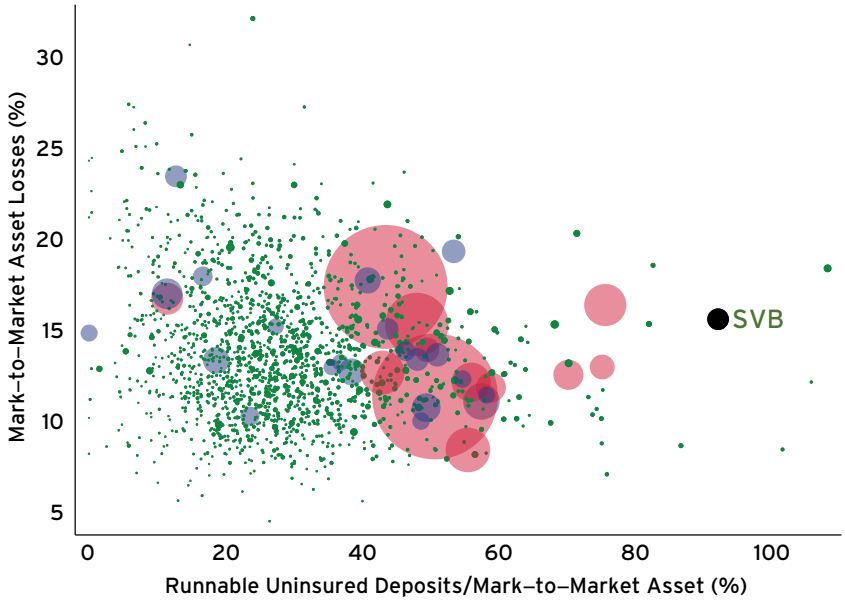



Note: This figure plots the histograms (density) of uninsured deposit to asset ratios calculated based on 2022 Q1 balance sheets and mark-to-market values using method employed by Jiang et al. (2023a). The reference lines indicate SVB's values. SVB's uninsured deposit ratio is 78% based on its 2022 Q1 balance sheet, which is about $169 billion. Its uninsured deposit to mark-to-market asset ratio is 92%. Both reference lines are at the 100th percentile.

Source: Jiang et al. (2023a).

Given this, how does one assess the fragility in the banking system? We know that both marked-to-market losses and uninsured leverage are jointly important determinants of this fragility. What is also critical is the proportion of uninsured depositors who might be withdrawing. One approach to analysing this is to take an extreme view and assume that 100% of uninsured depositors get spooked by the marked-to-market losses of a bank and run. We can ask if a bank would have enough funds to cover its insured depositors in that scenario. We consider a bank insolvent if the marked-to-market value of its assets, after paying all the uninsured depositors, would be insufficient to pay insured depositors. We plot all the insolvent banks using this scenario. Specifically, in Figure 3.22 we look at 'turbulence' on the asset side (i.e., marked-to-market losses faced by a bank) on the vertical axis versus 'flight risk' (proportion of uninsured depositors of a bank) on the horizontal axis. The size of the bubbles in the plot represents the assets of the banks, with the biggest bank in the plot having over £1 trillion of assets.

FIGURE 3.22 **UNINSURED LEVERAGE AND UNREALISED LOSSES ('FLIGHT RISK' VERSUS 'TURBULENCE')**



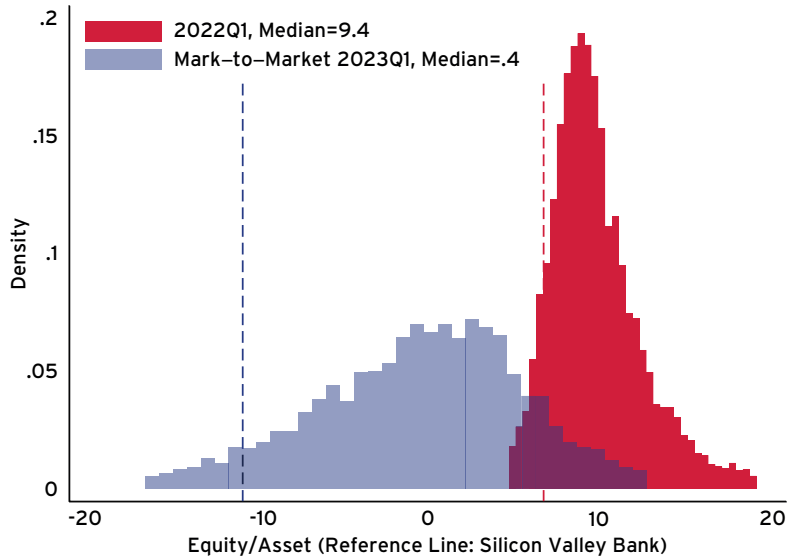

Note: A plot of the full set of 'insolvent' banks. A bank is considered insolvent if the mark-to-market value of its assets, after paying all uninsured depositors, is insufficient to repay all insured deposits. On the vertical axis we plot mark-to-market losses as a percentage of initial bank asset value. On the horizontal axis we plot uninsured deposits as a percentage of mark-to-market bank asset value. The assets are based on bank call reports as of 2022 Q1, and banks with larger asset size are marked with bigger dots. Banks in the top right corner, where SVB is, have the most severe asset losses and the largest runnable uninsured deposits to mark-to-market assets. The red dots correspond to the ten largest insolvent banks. Out of these, one has assets above $1 trillion, three have assets above $200 billion (but less than $1 trillion), three have assets above $100 billion (but less than $200 billion), and the remaining three have assets greater than $50 billion (but less than $100 billion). We also show SVB (assets of $218 billion in the plot).

Source: Jiang et al. (2023a).

SVB stands out, but it is clearly not an 'outlier'. Several other banks of similar size or even larger than SVB in the system would be insolvent under the extreme scenario we consider. Put another way, in this scenario, several other banks clustered around SVB would also be susceptible to the same run risk as SVB. This inference can also be seen in Figure 3.23, where we plot distributions of equity over assets, with orange representing the distribution before the tightening and black the distribution after the tightening with assets that are marked to market. SVB is shown with vertical dotted lines in both cases.

As Figure 3.23 shows, the equity in the entire banking system was what would be considered 'well capitalised' before the monetary tightening. Even in the extreme scenario that assumes that all the uninsured depositors run, given that there were no marked-to-market losses before tightening, one can see that the entire marked-to-market value of equity to assets distribution is well above 0%. However, after the tightening, the equity of many banks on a marked-to-market basis is below 0%, that is, many banks are potentially underwater and insolvent.

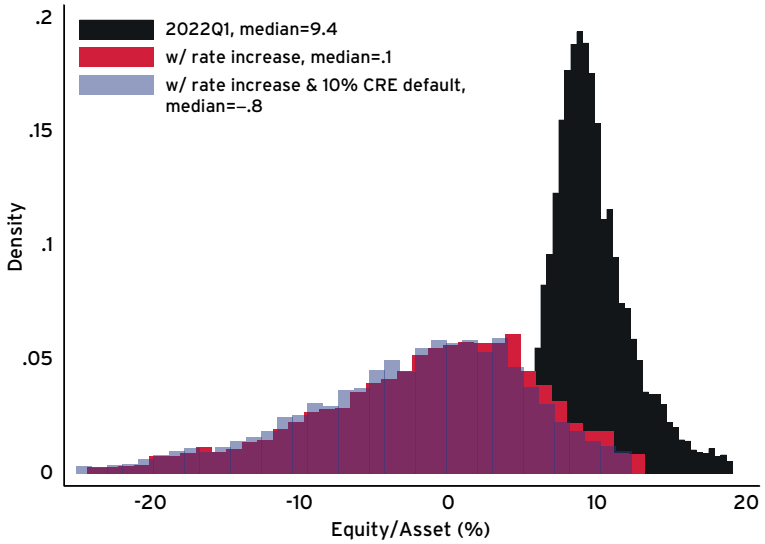
FIGURE 3.23 **DISTRIBUTION OF EQUITY/ASSETS OF US BANKS**




Note: This figure plots the histograms (density) of equity-to-asset ratios calculated based on 2022 Q1 balance sheets and mark-to-market values using the method in Jiang et al. (2023a). The reference lines indicate SVB's values. SVB's equity-to-asset ratio is 6.7% based on its 2022 Q1 balance sheet. The ratio of its equity to mark-to-market assets is -10.7%. The red and grey lines are at the 10th and 7th percentiles, respectively. Prior to the monetary tightening, the banking system (on average) was well capitalized, based on the orange distribution of the chart. The black distribution illustrates that after the tightening, the equity at several banks was underwater.

Source: Jiang et al. (2023a).

FIGURE 3.24 **HISTOGRAM (DENSITY) OF THE EQUITY-TO-ASSET RATIO, VALUING ALL NON-EQUITY BANK LIABILITIES AT FACE VALUE**




Note: The equity-to-asset ratio is plotted for three cases. The distribution that also incorporates losses from the CRE distress scenario assumes a 10% default rate on commercial loans at each bank and a 70% recovery rate.

Source: Jiang et al. (2023c).

The banking sector could be in a worse shape if we also took CRE default risk into account. In Figure 3.24, we overlay an additional distribution that shows how the losses would look if we added a 10% CRE loan default rate to the marked-to-market losses we presented in Figure 3.23. As can be seen, the distribution will shift further to the left, putting several other US banks underwater.





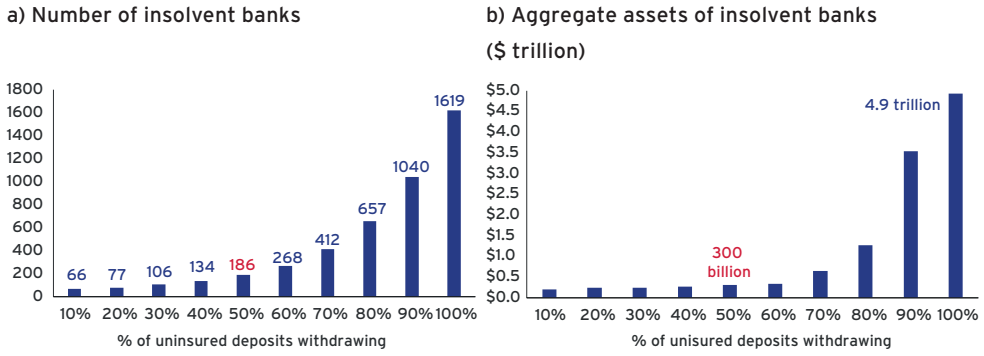
So far, we have taken an extreme view in assuming that all uninsured depositors run. As noted before, there might be multiple equilibria possible in such a situation depending on the magnitude of marked-to-market losses and the proportion of uninsured depositors who might run. The equity capital of a bank also matters, since it can absorb losses before they might impact the value of depositors.

It is worth emphasising that the setting we are confronted with during the 2023 banking turmoil is not a classic Diamond-Dybvig model of bank runs (Diamond and Dybvig, 1983). In that model, bank runs are triggered by a potential change in the value of illiquid assets. Solvency runs – the ones we are confronted with – are triggered by declines in the value of liquid (and some illiquid) assets as interest rates rise sufficiently. In addition, enough uninsured depositors need to think that other uninsured depositors would be running from the bank, because of these (unrealised) losses. Finally, the runs are accentuated if the bank does not have enough equity to absorb the losses that would be realised when it would have to liquidate some of its assets to fulfill the withdrawal demand of depositors. When this occurs, unrealised marked-to-market losses become realised, potentially prompting more depositors to withdraw, triggering a self-fulfilling solvency run. If the bank had enough equity, that would alleviate the concerns of uninsured depositors since its buffer could absorb the losses that occur when selling assets.

It is also clear that a bank is more likely to face a solvency run if it has a higher proportion of uninsured depositors. Recall that the figures above consider an extreme version where all uninsured depositors ran. In Figure 3.25, we consider different scenarios. On the horizontal axis in both charts are different scenarios in which the proportion of uninsured depositors running varies, ranging from zero to 100%. The chart on the left plots the number of insolvent banks on the vertical axis. The chart on the right reflects the assets (in trillions of US dollars) at risk of such a run for different scenarios. Assuming half the uninsured depositors run, we would have about 200 banks potentially underwater, with $300 billion of assets at risk.

FIGURE 3.25 **WHERE ARE SELF-FULFILLING SOLVENCY RUNS POSSIBLE?**

Based on our analysis and model, when interest rates rise, solvency runs are more likely in banks where equity capital is low and where a substantial proportion of uninsured depositors provide funding to the bank




Note: This figure presents the number of insolvent banks (left) and their aggregate assets (right) associated with a given uninsured deposit withdrawal case. We consider ten cases ranging from 10% to 100% of uninsured deposits being withdrawn at each bank. The bank is considered insolvent if its mark-to-market value of assets – after paying a given share of the uninsured depositors – is insufficient to repay all insured deposits.

Source: Jiang et al. (2023a).

### 3.2.7 What about supervisors/regulators?

Why did the regulators and supervisors fail to catch all this? It is possible that the focus of regulators was on the 'credit risk' of banks, in line with bank failures from the Great Recession. Indeed, most of the tools in the regulatory toolkit were geared to dealing with such runs, and not solvency runs driven by high interest rates. The diagnosis of regulators on 'what was behind SVB and other failures' suggests this might not be far-fetched. For instance, the Barr Report (FRB, 2023) mentions the word "liquidity" in relationship to SVB's failure 320 times, while "solvency" is only mentioned once.[27] But there were also structural weaknesses in supervisory arrangements that help explain the poor record (reviewed in Chapter 4).

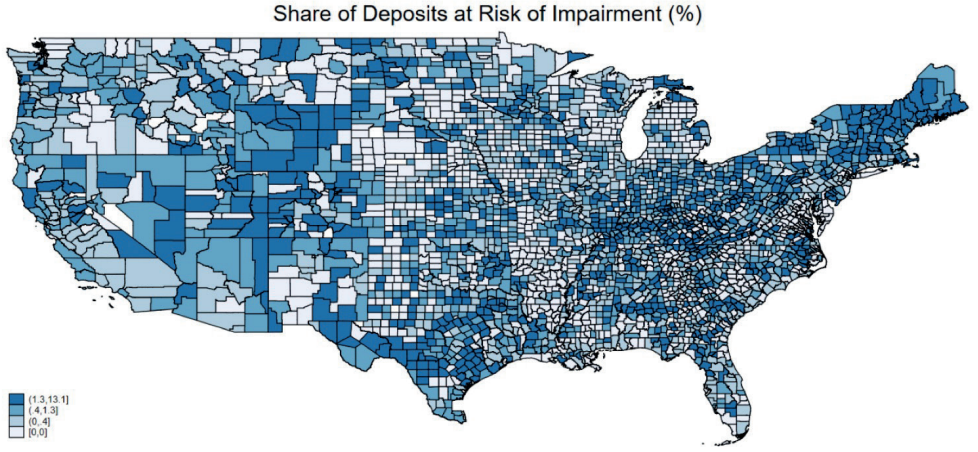
### 3.2.8 Was this just a tech phenomenon?

As we have already seen, the losses were spread across banks in the banking system. Moreover, the widespread presence of solvency run risk, which combines the losses with uninsured leverage of the bank, clearly shows that SVB is not an outlier. The question is whether this is really a 'tech phenomenon' occurring only to banks in California and maybe on the East Coast.

Figure 3.26 plots deposits in the US across regions that are at risk

27 On 28 April 2023, the Federal Reserve Board released its *Review of the Federal Reserve's Supervision and Regulation of Silicon Valley Bank*, led by Vice Chair for Supervision Michael S. Barr. As is noted in the report, the failed banks all had bad management and governance practices.

FIGURE 3.26 **BEYOND SVB? A LOOK AT THE GEOGRAPHIC DISTRIBUTION OF 'DEPOSITS AT RISK'**




Note: The figure displays, based on the analysis, the extent to which deposits in banks are at risk. Darker colours convey more bank deposits are at risk.

Source: Jiang et al. (2023a).

As can be seen, deposits are at risk across the United States. While this is based on the call report data and marked-to-market exercise we conducted earlier, there is an independent verification of the extent of the problem. Before government intervention after SVB's failure, the equity prices of the few publicly traded regional banks across the country had fallen dramatically. In fact, even after the government intervention, the market value of equity of these banks continues to be lower relative to before the banking turmoil started in the United States. This points to the pervasiveness of the problem that is spread across the banking system.

### 3.2.9 What is next in the 'short run'?

The Federal Reserve has extended deposit insurance to uninsured deposits in the aftermath of SVB's failure. In addition, it started the Bank Term Funding Program (BTFP), which buys underwater assets at par. All of this has been useful in the short run to alleviate the worries of market participants. But because there are many potentially insolvent banks, we need to worry about economic outcomes that might resemble those in early 1980s during the 'Savings and Loans Crisis'. That crisis unfolded with a series of similar initial events: (i) several financial institutions in trouble (i.e., potentially insolvent) due to high interest rates in the economy; and (ii) short-term support from the government to the institutions to alleviate concern among market participants. The support ended up incentivising many insolvent institutions to 'gamble for resurrection' – where these institutions took substantial new risks – leading to substantial long-term losses for taxpayers.

We are certainly facing a comparable situation with many potential insolvent banks getting government funds in support. Tracking which banks have been using government support and what they might be doing with these funds could provide us with some guidance. Although the Federal Reserve has not disclosed the detailed funds they distributed through this programme, some information is now available in the bank call reports. The borrowing under BTFP (and from FHLB) is short-term (i.e., within one year), which shows up as the "other borrowings with a remaining maturity of one year or less" in the participant bank's call report. In the left panel of Figure 3.27, we see endangered banks (i.e., those that were potentially insolvent as of 2023 Q1 if a substantive proportion of their uninsured deposits withdrew) getting help from the BTFP and FHLB with an increase in their short-term borrowing. However, this does not seem to be helping with their situation: depositors are still withdrawing their funds from those banks. On the right panel in Figure 3.27, we still see a significant decline in their deposits after 2023Q1. As these potentially insolvent banks continue to lose funding from their deposits, they will become even more reliant on government funding, putting them at an elevated risk of 'gambling for resurrection'.[28]

The issue with the short-term lending programme is that it does not fundamentally address the interest risk faced by banks, and we witnessed more bank failures following SVB: immediately on 12 March 2023, Signature Bank closed; despite the launch of BTFP, on 1 May 2023 the FDIC announced the closure of First Republic Bank, which was sold to JPMorgan Chase. All three failed banks had suffered significant mark-to-market losses and relied heavily on funding from uninsured deposits. We also witnessed substantial uninsured deposit withdrawals in each of these banks before their closure. As long as interest rates remain high, substantial interest rate risk-induced unrealised losses will persist in the banking sector (see Figure 3.28). Short-term borrowing also does not address the risk associated with CRE loans. Such risk is particularly salient among small regional banks, which hold about 80% of these CRE loans.

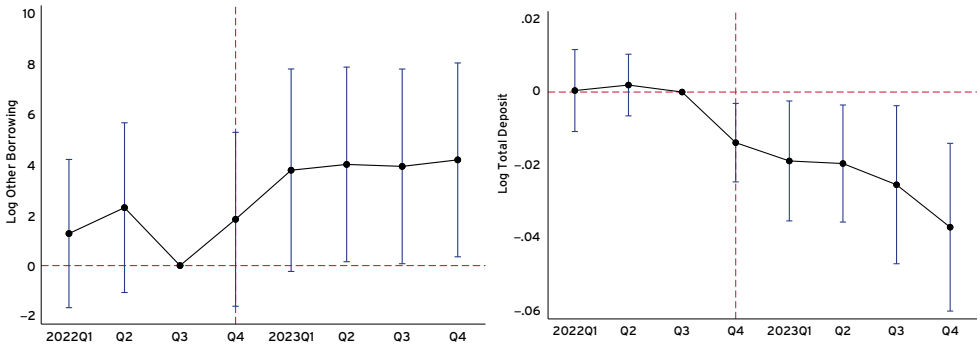
Put simply, what we saw during the Savings and Loan Crisis was several insolvent banks taking inordinate and imprudent risks when their liability side was protected by the government. That resulted in long-term losses that were absorbed by taxpayers. The current situation is not too dissimilar to how the Savings and Loan Crisis unfolded slowly over many years. Today, the United States has many potentially insolvent banks together with many solvent, but illiquid, banks. Already many banks need to raise capital to cover their existing losses, as shown in Figure 3.29 (and discussed in detail in Chapter 5). Policymakers need to address this situation to ensure that history does not repeat itself. We turn to possible policy solutions in Chapter 5.

28 As noted, we already saw some evidence of banks 'gambling for resurrection' with respect to their hedging activity: banks increased their current earnings by selling profitable hedges while exposing themselves to even larger interest rate risk. If the interest rate declines and the bank survives, the shareholders benefit from this strategy. However, the FDIC, and ultimately taxpayers, will have to bear the cost if the bank fails (Seru, 2023a).

FIGURE 3.27 **BORROWING FROM GOVERNMENT**

a) Borrowing from Federal Reserve programme

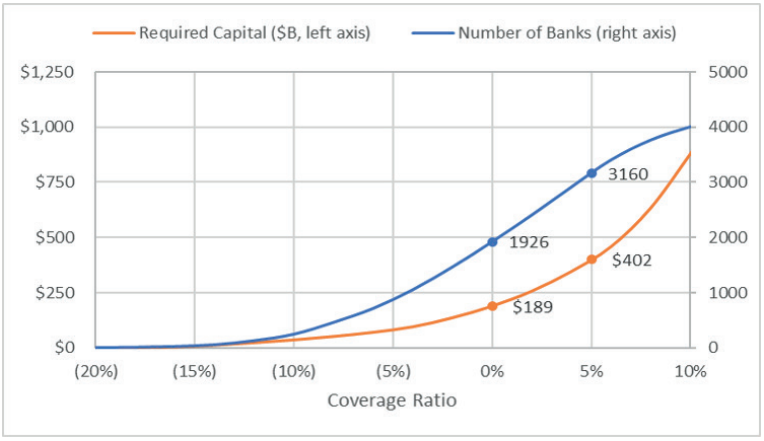
b) Total deposits




Note: The left panel plots how other borrowings change for endangered and non-endangered banks. The right panel plots shows how total deposits change for endangered and non-endangered banks. The figures plot $\beta_t$ from the specification estimated using bank quarterly call reports from 2022 Q1 to 2023 Q4: $Y_{i,t} = \Sigma_t \beta_t(I_t \times Endangered_i) + \gamma_t(I_t \times Size_i) + \mu_i + \nu_t + \epsilon_{ti,t}$ where $I_t$ is a date indicator. $Endangered_i$ is an indicator for whether the bank is classified as endangered in 2023 Q1. It is classified as one if it cannot pay debtholders with its mark-to-market assets, under 50% uninsured deposit withdrawal. $Size_i$ is log asset in 2022 Q1. $\mu_i$ and $\nu_t$ are bank and quarter fixed effects.

Source: Bank call reports and author calculations.

FIGURE 3.28 **NUMBER OF ENDANGERED BANKS AND EQUITY NEEDED TO RAISE THEIR COVERAGE RATIOS**




Note: The blue line shows the number of banks below each coverage ratio. The orange line shows the total capital required to restore a coverage ratio for all banks. A negative coverage ratio indicates insolvency on a marked to market basis, i.e., banks with negative coverage ratio have the mark-to-market value of their assets below the level of their existing deposits and government-backed loans.

Source: DeMarzo et al. (2023).

# CHAPTER 4



# Failures in supervisory, regulatory and monetary policies and coordination

This chapter analyses a number of failures in supervisory, regulatory and monetary policy, as well as in coordination and other areas that have plagued the European and US banking systems for some time and that contributed to the financial turmoil in March 2023. Policy implications follow in Chapter 5.

## 4.1 EURO AREA BANKING INTEGRATION: WHY SO LIMITED, WHAT COSTS, AND WHAT HAS BEEN DONE?

A long-standing, far-reaching and difficult to address issue has been the segmentation of the euro area banking sector along national lines. As of today, with harmonised regulation and ten years after the launch of the Banking Union and a generally recognised successful centrally (SSM-)led supervision, banking in the euro area remains a collection of loosely connected national systems, rather than an integrated system. If anything, banking has become more fragmented along national lines in recent years. Why this failure? What are the costs, today and going forward, of this fragmentation? What has been tried to address it? And what can be done better?[29]

The fragmentation has several proximate causes and one deeper one. One proximate cause is that the policy efforts devoted to 'de-risking' banks after the euro crisis of 2010-2012 often involved reducing cross-border exposures, as these are harder to assess and often riskier. A second is that banking legislation, although formally called 'single', is not cross-border friendly. Prudential norms still prohibit or discourage the free movement across borders of capital and liquidity between subsidiaries of banking groups. Besides regulatory barriers, supervision retains many national 'ring-fencing' elements. Third, crisis management framework and practices still rely mainly on national liquidation rules. Finally, the fundamental cause of fragmentation is that banks are backstopped by national deposit insurance schemes and other national resources. This means there is no euro area-wide burden-sharing scheme for weak banks. This leads to home bias. When banks remain national 'in death', they will refrain from being international 'alive', reversing the metaphor popularised by Thomas Huertas (2009) and Mervyn King (2010).

29 Further details on causes, implications and remedial actions can be found in a report presented to the European Parliament (Angeloni, 2024).

The euro area does not have other risk-sharing mechanisms that are typical of federal jurisdictions like the United States and Germany and crucial for well-functioning economies. Cimadomo et al. (2018) compare risk-sharing in the United States and the euro area using a methodology borrowed from Asdrubali et al. (1996) and Asdrubali and Kim (2004). They show that in the United States, state-specific idiosyncratic shocks are smoothed by financial markets (30%), credit (20%), and fiscal transfers (10%). In the euro area, such shocks are largely borne at the country level as financial markets and public budgets play virtually no risk-sharing role, and credit often acts in a perverse manner, exacerbating national shocks. With fiscal union not likely soon (while the sizeable NextGenerationEU is funded in part by common resources, it remains a one-off) and the Capital Markets Union essentially just a blueprint, for the near future risk-sharing will happen either through banks or not at all.

This fragmentation is costly. A banking system that is more integrated is more resilient and suffers less from national biases, including the associated bank–sovereign doom loop. Besides risk-sharing, cross-border banking is a powerful engine for competition, innovation and efficiency, elements that are missing in the euro area. Integrating the banking sector is even more essential for Europe today given the large investment needs related to structural changes. Four such changes stand out: addressing climate change; enhancing security and defence; reaching and staying close to the digital frontier; and making the economy less dependent on exports to ensure its sustainability in a less globally integrated world.

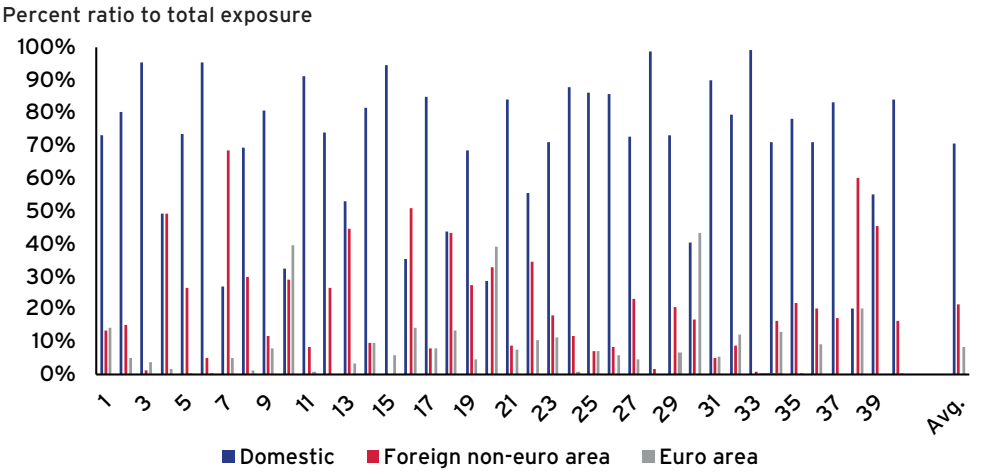
An integrated banking market does not require all banks to adopt euro area business strategies. A euro area-wide presence is only realistic for those banks with the necessary size, structure, management and ambition. The United States, a well-integrated economy, shows this as only a few banks have national reach there (Angeloni et al., 2021). Today, only very few euro area banks are active across the euro area and outside. These banks have long had international footprints, with entities in other countries, and have continued to expand across borders throughout recessions and the pandemic. But, as Figure 4.1 shows, their euro area exposures are still most often less than their non-euro area exposures – let alone their domestic exposures.

Figure 4.2 shows the cross-border exposures within the euro area for each of the top 40 banks.[30] In addition to the level of these exposures (as a percentage of a bank's total assets) in 2017, it shows the change between two subperiods: 2010-13 and 2014-17 (2017 is the latest year available for these data). Also reported are the means and (two times) the standard deviations. The data on levels show that the typical within-euro area cross-border exposure is quite low: only in three out of 40 cases – BNP Paribas, ING and UniCredit – is the exposure sizeable (around or above 40%). The data also reveal

30 Charts from Angeloni (2024), based on data from Duijm and Schoenmaker (2020).

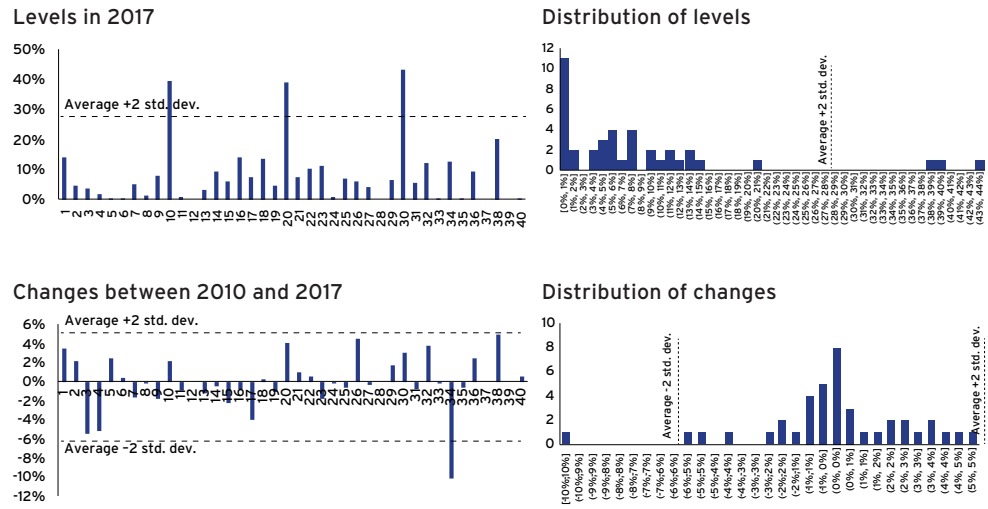
that for most banks there was no change at all between the two periods. Angeloni (2024) shows that banks with larger intra-area cross-border exposures tended to increase their exposures between the two periods and to expand their cross-border presence over a large number of countries.

FIGURE 4.1 **CROSS-BORDER EXPOSURES OF THE 40 LARGEST EURO AREA BANKS**




Note: Shares of total exposures of all forms (direct lending across border, indirect lending via subsidiaries and branches, securities holdings, etc.). See Angeloni (2024) for sources and details.

FIGURE 4.2. **WITHIN-EURO AREA CROSS-BORDER BANKING IS FOR A FEW BANKS ONLY**




Notes: Total exposures in all forms (domestic and foreign euro- and non-euro-area; shares to total). Level and changes, their distribution and confidence bounds.

Recent reform efforts by the European Commission have not explicitly focused on furthering an integrated banking market. Instead, they have concentrated on enhancing the framework for crisis management. In April 2023, the Commission tabled a set of legislative amendments, to be considered by the EU co-legislators, with its approval process expected to last no less than two years. While useful, the initiative does not sufficiently address fragmentation. It is motivated principally by issues facing small and medium-sized banks and aimed at strengthening early actions before resolution (reforms involve encouraging the adoption of a European resolution process in lieu of national liquidation, giving more resources to resolution authorities, notably by involving deposit insurance schemes, and promoting more effective cooperation among the authorities involved). But the focus of reforms should be more on creating the conditions for those banks with international ambitions to operate in more countries within the euro area. A window of opportunity exists now, with the profitability of most euro area banks boosted by larger interest rate margins and many bank valuations at a six-year high. A specific proposal follows in Chapter 5.

## 4.2 THE UNITED STATES: THE CONTINUED SUPERVISORY FRAGMENTATION AND ITS COSTS

Both regulation and its enforcement in the banking sector in the Unites States are fragmented and pretty complex. The vast majority of mid-sized banks like SVB and First Republic Bank are regulated and overseen by multiple supervisory agencies – state and federal – with overlapping coverages. While such a fragmented regulatory structure with overlapping regulators might have benefits (for example, more comprehensive information), it is particularly vulnerable when risk, such as liquidity risk, builds up quickly. Furthermore, it can end up focusing on narrower issues and not picking up broader trends (such as the commonality of large increases in Treasury security holdings by banks). In addition, one must confront the political economy of such a regulatory system. It, like the parts of supervision in the euro area that are national-based, can create a home bias, further weaking supervisory effectiveness.

About a decade ago, Agarwal et al. (2014) pointed out the large inconsistency in the enforcement of straightforward rules due to multiple supervisors enforcing regulation in US banks. The authors found that different regulators implemented the same rules for a given bank differently. Local (state) regulators tended to be too soft on the bank, especially when the local economy was not doing well.

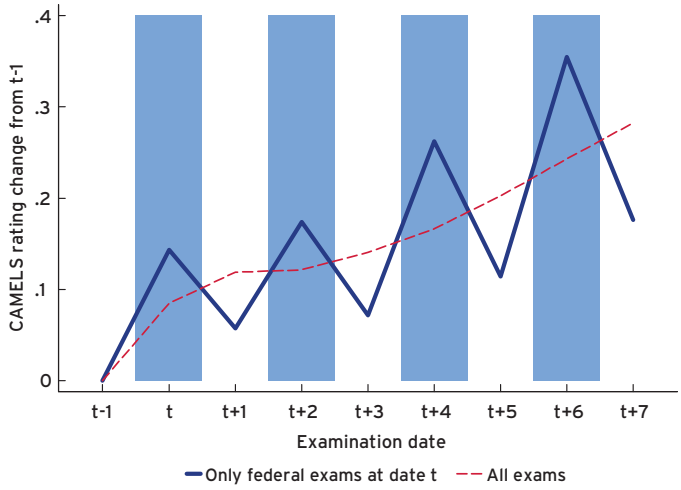
The main finding is summarised in Figure 4.3. The white vertical zones in the figure indicate when state regulators are in charge of enforcement at a bank, and the grey zones are when federal regulators are in charge of the same bank in rotation. What is plotted is

the CAMELS rating, which drives all the regulatory actions and their severity.[31] A good rating (i.e., a smaller number) implies a healthy bank, which translates into regulatory actions such as approvals to acquire; a bad rating (i.e., a higher number) implies a bank with weak health, which translates into regulatory actions such as a higher FDIC deposit insurance premium. The figure shows that during the spell of a federal regulator, CAMELS ratings go up (i.e., the arm's length regulator is tougher on a bank). This is partially undone when the state regulator spell follows (i.e., the local regulator is softer on the same bank at virtually the same time). Agarwal et al. argue that this is the case because a local bank (like SVB) is pretty important to a state regulator, given its importance to the local economy. Federal regulators, being more arm's length, were tougher on banks.

What did this all mean last year and in the current context? To gauge whether such fragmented regulation might have impacted potentially troubled banks highlighted earlier, Figure 4.4 plots the same picture as Figure 4.3 but illustrates how many of the potentially insolvent banks are regulated by state and federal regulators in tandem. As can be seen, a substantial number of potentially insolvent banks were regulated under the dual structure. For a large majority of banks in the United States (including SVB and First Republic), federal and state agencies oversee a given bank in rotation.

FIGURE 4.3 **WHAT ABOUT REGULATORY ENFORCEMENT?**

Based on our analysis, banks such as SVB (and First Republic), which are regulated under dual regulators in rotation, face potentially inconsistent enforcement of regulation

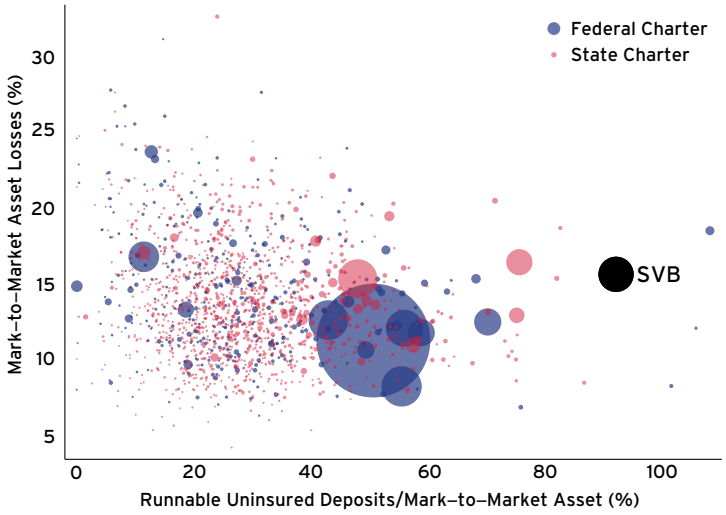



Note: This figure plots the average cumulative CAMELS rating change from the level prior to each exam to the level at the exam (shown as the first rotation) and afterwards (the second to the eighth rotation). The solid line shows the average cumulative CAMELS evolution for all examinations in the sample. The dashed line, instead, shows the average cumulative CAMELS evolution conditional on the first exam being conducted by a federal agency. Because the examiner rotates at each exam, federal exams occur at odd rotations (highlighted as the grey bars), while state rotations occur at even rotations.

Source: Agarwal et al. (2014).

31 The CAMELS rating system is used to assess a bank's overall condition. It is an acronym for capital adequacy, assets, management capability, earnings, liquidity, and sensitivity.

FIGURE 4.4 **UNINSURED LEVERAGE AND UNREALISED LOSSES ('FLIGHT RISK' VERSUS 'TURBULENCE') WITH FRAGMENTED REGULATORY STRUCTURE**




Note: A plot of the full set of 'insolvent' banks. A bank is considered insolvent if the mark-to-market value of its assets – after paying all uninsured depositors – is insufficient to repay all insured deposits. On the vertical axis we plot mark-to-market losses as a percentage of initial bank asset value. On the horizontal axis we plot uninsured deposits as a percentage of mark-to-market bank asset value. The assets are based on bank call reports as of 2022 Q1, and banks with larger asset size are marked with bigger dots. Banks in the top right corner, where SVB is, have the most severe asset losses and the largest runnable uninsured deposits to mark-to-market assets. Red dots correspond to state-chartered banks. Green dots correspond to federal chartered banks. SVB is state-chartered; 77% of insolvent banks are state-chartered. Federally chartered banks own $3 trillion in assets in total, and state-chartered banks own $2 trillion in assets in total.

Figures 4.3 and 4.4 illustrate that inconsistency due to a fragmented supervisory structure can be particularly problematic when conditions affecting a bank's health change rapidly. Recall that the rotation from state to federal supervision (or vice versa) occurs once every year or year and a half. The turmoil in the banking sector, driven by steep monetary tightening in the latter half of 2022, unfolded relatively quickly. Our findings suggest that a fragmented and inconsistent supervisory structure, with diffused responsibilities across regulators with potentially different incentives, may struggle to adapt swiftly and address gaps that arise across multiple unhealthy banks in the system.

## 4.3 G-SIB RECOVERY AND RESOLUTION: STILL UNTESTED AND NOT TRUSTED

Resolution regimes for G-SIBs post-GFC have been using as guidance the "Key Attributes of Effective Resolution Regimes for Financial Institutions" (henceforth, "Key Attributes"), introduced by the Financial Stability Board in 2011 (FSB, 2011). The Key Attributes represent the policy response to the challenge of managing the failure of systemically important financial institutions (SIFIs) without resorting to taxpayer-funded bailouts. The Key Attributes are the international standard for effective resolution regimes, aiming to minimise the systemic risks posed by failing financial institutions while safeguarding financial stability and reducing the need for taxpayer bailouts. They consist of twelve essential features (see Box 4.1).

The 2021 FSB review of the 'too big to fail' (TBTF) framework (FSB, 2021) offered a favourable assessment of policymakers' efforts. It documented the considerable progress made in implementing resolution reforms and the greater market confidence in the credibility of addressing weaknesses of systemically important banks. Most home and host jurisdictions had comprehensive regimes for resolving failing banks, with many authorities producing resolution plans for G-SIBs. Cross-border crisis management groups were established, and cooperation agreements signed. Moreover, most G-SIBs met TLAC requirements, ensuring they had sufficient equity and debt resources to absorb losses and recapitalise without taxpayer support. Market evidence suggested that resolution had become more credible. Funding cost advantages of systemically important banks had decreased post-reforms, though remaining high. Credit rating agencies had removed assumptions of sovereign support in several jurisdictions, expecting bail-ins for failing G-SIBs. Overall, the report accordingly depicted an increasingly favourable view of resolution regimes, especially in jurisdictions hosting G-SIBs (Figure 4.5).

BOX 4.1 **SUMMARY OF THE "KEY ATTRIBUTES OF EFFECTIVE RESOLUTION REGIMES FOR FINANCIAL INSTITUTIONS"**

The Key Attributes outline funding arrangements, powers, requirements for cross-border cooperation and planning to facilitate effective resolution, and legal safeguards.

**Funding:** Resolution regimes should provide options for privately financed resolution funding to avoid reliance on public funds. If public funds are used, mechanisms should be in place to recover them from the firm, its creditors, or the broader financial sector. Access to temporary liquidity for firms in resolution needs to be ensured.

**Resolution powers and tools:** Resolution authorities should possess a broad range of tools and powers to manage the failure of a G-SIB while ensuring the continuity of its critical functions. These may include transferring ownership or assets, writing down liabilities, imposing temporary stays on termination rights, and liquidating all or part of the G-SIB. Home country resolution authorities have to be able to write down unsecured liabilities or convert them to equity with the purpose of absorbing losses or providing capital ('bail-in'). Such bail-in powers are supported by the FSB TLAC framework requiring G-SIBs to hold bail-in-able liabilities.

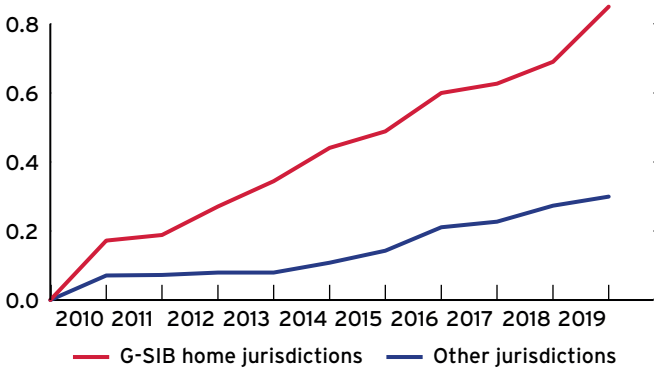
**Cross-border cooperation:** The Key Attributes emphasise the importance of cross-border cooperation and information-sharing. Crisis Management Groups (CMGs) of home and host authorities of the G-SIBs are established to facilitate coordination and information exchange and resolution planning. National legal frameworks should provide timely processes for giving legal effect to resolution measures of a foreign G-SIB in resolution (e.g., conversion of bail-in bonds).

**Recovery and resolution planning:** G-SIBs are required to maintain and regularly update recovery and resolution plans, outlining strategies for restoring financial soundness and detailed operational plans for implementing resolution strategies ('living wills'). Recovery plans should offer realistic solutions for restoring financial or operational stability under different stress scenarios. Authorities should assess the feasibility of these plans and be empowered to enforce measures to ensure resolvability.

**Legal safeguards:** The Key Attributes include legal safeguards to protect the rights of creditors and shareholders during the resolution process. The 'no creditor worse off' principle ensures that losses incurred during resolution are no greater than they would have been in a liquidation scenario.

Source: See https://www.bis.org/fsi/fsisummaries/fsb_key_attributes.htm

FIGURE 4.5 **RESOLUTION REFORM INDEX (RRI) SCORE FOR G-SIB HOME AND OTHER JURISDICTIONS**




Notes: Higher is better.
Source: Figure 5 in FSB (2021).

However, the review also identified gaps in the framework which turned out to be important in the case of Credit Suisse, the first real life test of a G-SIB resolution. These included the following:

1. **One important gap shown was that many jurisdictions lack adequate provisions for funding in resolution**. Any failing bank will face significant liquidity stress, both before and in resolution. Thus, for an orderly resolution, regulatory authorities must be able to mobilise liquidity, besides within the bank, from the central bank and/or through public backstops. This gap continues to exist in the European Union, where the backstop for the SRB is still being held up. It was also a gap in Switzerland until the Credit Suisse failure, but by March 2023 there was no choice. As the run on Credit Suisse escalated, the SNB first extended its emergency liquidity assistance, supported eventually by a fiscal backstop.[32] The Swiss government then provided SNB a guarantee of CHF 100 billion (about 12% of Swiss GDP) using an emergency law. This allowed SNB to provide Credit Suisse at peak CHF 1680 billion. The clear lesson is that potentially exceptionally large sums of funding in resolution a G-SIB are necessary. This calls for a mechanism to be established to provide such liquidity that is credible, i.e., not limited ex ante. Otherwise, the authorities will resort to fixes and bailout rather than bail-in.[33]

32 In the end, the backstop was not used since there were no losses (and the government and the central bank actually made significant profit from the guarantees when UBS returned them five months later). Nevertheless, having to resort to emergency law and provide state support was shocking and damaged authorities' reputation.

33 Switzerland had been debating for years the establishment of a public liquidity backstop to support the central bank in case of losses in its provision of liquidity for a bank in resolution. However, the proposal had faced strong resistance because of fears of moral hazard and violating the principle of not putting any taxpayer money at risk and lacked urgency. To avoid having to resort to an emergency law again, the government introduced in 2023 a bill of law to establish a public liquidity backstop on a permanent basis. The proposal is that G-SIBs should be required to pay a compensation (a form of insurance premium) for the state guarantee, the level of which was still under discussion at the time of publication.

2. **A second lesson is that the untested bail-in resolution regime remains poorly understood and is perceived as being 'too risky'**. Outside a narrow circle of supervisory authorities directly involved in the crisis management committee, there was (and remains) a widespread misunderstanding of how the resolution regime would have worked. A particular confusion was between a bail-in resolution and a bankruptcy saving only the Swiss systemic parts of Credit Suisse. During the crisis weekend, the option of a bail-in resolution was dismissed and instead the Swiss authorities facilitated a distress merger of Credit Suisse with UBS (Box 4.2). This leaves open the question of whether the orderly bail-in resolution of a G-SIB, under preparation for over a decade, would have worked. Many doubted that it could have been implemented and spoke of incalculable risks to financial stability; others pointed to technical hurdles and operational hurdles, but not to an impossibility or an overly high risk.





BOX 4.2. **OPTIONS AND CHOICES IN THE RESOLUTION WEEKEND OF CREDIT SUISSE**

In the run up to the resolution weekend, the Swiss authorities had considered four options:

1. **Bail-in resolution of Credit Suisse.** FINMA declares the point of non-viability and orders restructuring and capital measures. This was the TBTF resolution option and had been prepared by the international crisis management group. But it required an emergency law to secure funding in resolution.
2. **Nationalisation and temporary public sector ownership.** This option is not foreseen in the Swiss TBTF regime and was dismissed.
3. **Assisted merger of Credit Suisse with UBS.** This option that was chosen, but it also required emergency law to secure funding in resolution.
4. **Bankruptcy and activation of Swiss emergency plan.** This would only have been a last resort if the other options were deemed infeasible.

In the end, the merger was considered the least risky option. It involved the following:

- UBS paid shareholders CHF 3 billion to acquire Credit Suisse (with additional public support). Note that shareholders were not fully wiped out.
- Credit Suisse's Additional Tier 1 (AT1) bonds (CHF 16 billion) were wiped out, possible since they contained a clause which allowed for a full write-down if public support was provided.
- Liquidity support totalling up to CHF 250 billion (from the SNB), of which CHF 100 billion was backed by a federal default guarantee, a public liquidity backstop, enacted by an emergency legislation.
- The Swiss federal government assumed a second loss tranche guarantee capped at CHF 9 billion for certain hard to value assets. UBS took the first loss of CHF 5 billion.

On 11 August, UBS returned the guarantees and paid the government about CHF 200 million in fees.

Source: FINMA (2023, p. 19ff).

What would have happened if the open bank bail-in option had been applied? FINMA would have declared the point of non-viability (PONV), taken control, written down Credit Suisse's equity and Additional Tier 1 bonds (AT1s), ordered the conversion of all remaining TLAC into equity, and appointed a new management. On Monday morning, the 'New Credit Suisse' would have started with an equity ratio of about 40%. The new management would have had time for recovery and to design a new strategy. This option had been prepared within the crisis management group – Credit Suisse's supervisors in Switzerland, the United Kingdom and the United States – for six months, and members stated that they were confident in it, even though it was not without risks. Risks include that the New Credit Suisse might continue to bleed liquidity and that the new management would have insufficient time to rebuild trust. Additionally, contagion of the largest bail-in to date (some $70 billion), difficult to determine, could have been large and threatened overall financial stability.[34] And there were legal obstacles (see below).

3. **A third challenge is assuring legal and other preparedness**. An open bank bail-in, involving the conversion of bail-in bonds into equity may face legal challenges, not sufficiently appreciated before the Credit Suisse case. Most relevant was the US SEC as US investors held some of the bail-in bonds issued. Under US law, the conversion to equity would have constituted a sale and all offers and sales of securities must either be registered or exempt from registration. The latter can be a lengthy process[35] and thus challenge the possibility of any open bank bail-in.[36] Legal certainty will generally remain unclear until all jurisdictions provide the necessary assurances that they will accept foreign bail-in. This affects all G-SIB resolution strategies where the home country supervisor bails-in all TLAC. It thus needs to be addressed urgently at the international level so that bail-in bonds can be converted with legal certainty and no challenge.

   More generally, the case showed that resolving a G-SIB over a single weekend is incredibly challenging, even without any technical obstacles. Authorities face extremely tough decisions. Fear of contagion and foreign pressure counsel against a sudden bail-in, so having more resolution options helps. Allowing for taking

34 On one hand, it could have been substantial, mainly because investors were not anticipating the bail in (see below). Even the smaller AT1 bail-in (CHF 16 billion) caused significant market jitters in European AT1 markets and rumors started to circulate that 'Deutsche Bank would be next'. The German Chancellor ever saw fit to intervene verbally on behalf of Deutsche. On the other hand, many market participants argued that contagion from the bail-in would have been contained because Credit Suisse was perceived as being unique.

35 Registration involves filing a registration statement with the SEC, accompanied by comprehensive disclosures, and updated financial statements which will be virtually impossible over a weekend and in the middle of a bank run. Registration typically takes months. Alternatively, issuers could seek exemptions from the SEC. While in the case of Credit Suisse, FINMA had spent month preparing and had involved the SEC in the crisis management group, the issue was not fully resolved. According to SEC staff, the financial institution bears the burden of proving qualification for exemption on a case-by-case basis. The SEC will not provide ex-ante comfort – even if the US council of the firm provides a positive legal opinion. The SEC retains the discretion to disagree and evaluate the case when it happens.

36 Just imagine the chaos if FINMA had announced the bail-in on Sunday evening and the SEC on Monday morning (New York time) had said that it first needed to review the file and could not be sure it would grant an exemption.

control of the bank and partial transfer to a bridge bank provides for more time for a sale or other resolution. The US FDIC has these options for its banks and the European Union is introducing more flexibility in resolution for all its banks (see further Chapter 4 in the Acharya et al., 2024). It should be explored for G-SIBs too.

4. **Major weakness in the recovery phase**. Ideally the endgame of resolution is credible but never tested. Preferably, the bank's course changes before it reaches the point of non-viability or a run precipitates its end. As is, achieving recovery is riddled with incentive problems, exacerbated in times of 'instant runs'. In principle, bank management and its board are responsible for taking actions when a bank is fragile. Detailed recovery plans are supposed to be in place to ensure recapitalisation, possible partial sales and other restructurings. In practice, management is overoptimistic about its plans and strategies, and does too little too late. As it prefers to reassure markets and clients of its soundness and outlook, it will avoid any actions that might 'look desperate' or signal trouble, including by not calling AT1 bonds or deferring AT1 interest payments. Supervisors also prefer not to send publicly negative signals, as these may accelerate non-viability and cause an instant run, and thus they refrain from intervening and also act 'too little, too late'. The multiple supervisors within and across jurisdictions typically involved with G-SIBs create further scope for incentive and coordination failures.

   A major specific problem is that AT1s are (also) supposed to be going concern capital, to serve as a 'reserve battery' when the main battery is running low. A high capital trigger could lead to automatic recapitalisation when capital is running lower and a discretionary trigger could secure additional capital in case of a viability event with public support. Swiss AT1s correspond to this design, but most European AT1s have too low a trigger to serve as an automatic going concern recapitalisation. And in practice, AT1s are used more in gone concern situations. The reactions of supervisors and market participants after the Credit Suisse write-down showed the need for more clarity on the role and design of AT1s. Market practices treat AT1 like high-yielding bonds and expect them to be called at the first date and always pay coupons. Not calling or not paying interest becomes a red flag, with potentially strongly negative market reactions, which a fragile bank will avoid at all costs. Overall, AT1s thus do not properly serve their function of going concern capital and are de facto procyclical in a fragile situation.

5. **Strengthening early intervention**. Resolution, especially across borders, will always remain difficult because of its complexity, possible adverse market reactions and contagion risks. Strengthening the recovery options is therefore crucial. In Chapter 5, we propose a special recovery regime for G-SIBs which endows supervisors with the powers to change a bank. The regime also mandates early supervisory intervention, to overcome the waiting problem, and protects

supervisors legally. Transparent early intervention may lead to earlier negative market reactions. However, since the current model incentivises supervisors and bank management to 'stay away' from early intervention, triggers should improve this trade-off, thus on balance strengthening the overall resilience of the system.

In the European Union, the Commission tabled a package of proposals in April 2023 to buttress the EU early intervention and some other crisis management-related weaknesses. The 2014 Bank Recovery and Resolution Directive (BRRD) already requires the preparation of recovery plans and assigns to the supervisor specific powers, besides determining the start of the early intervention. But provisions are weak and were in fact never implemented in full: recovery plans are not mandatory (management can always ex-post deem its implementation unnecessary) and the distinction between normal supervisory and early intervention measures is unclear (because measures under BRRD largely overlap with those of the Capital Requirements Directive of 2014 (CRD) and the SSM regulation).

The proposal aims to strengthen provisions by enhancing and clarifying the powers of the supervisor (including removing senior management, appointing special administrators) and by explicitly requiring the supervisor to start the early intervention phase early on, in collaboration with the resolution authority. While the new proposals do not differ from the BRRD in spirit, they have more detail and assign additional powers to the supervisor. Once in force, they should thus help ensure that, in future, early intervention will be undertaken more frequently and more effectively. However, the proposal does not improve on going-concern recapitalisation. The supervisor can only require a capital increase to be placed on the agenda of a shareholder meeting, with actions discretionary. There are still no provisions, either in the BRRD or in the proposed amendment, that prescribe the issuance of going concern ('high-trigger') AT1 instruments to ensure automatic recapitalisation of a bank before it reaches the point of non-viability. The 2023 proposal also provides for more recourse in the early intervention phase to national deposit guarantee schemes (DGSs), without ensuring that such schemes remain sufficiently funded so as to be able to insure all deposits covered.

The approval process is expected to be long – two years or more – and the changing Commission may cause further delay. However, overall, while the proposals could have been more ambitious in the areas mentioned and others as well, the priority now is to approve them as early as possible without further watering down.

## 4.4 FAILING TO INTEGRATE MONETARY AND FINANCIAL STABILITY POLICY – HOW IT MATTERED THIS TIME

Even by the widely varied case history of banking crises, the March 2023 banking turmoil had some rather unusual features. To start, it did not prominently have the typical warning signs of consumer and investor exuberance ('manias') followed by fear-driven

retrenchments ('panics'); nor was it accompanied by a build-up and then a burst of asset prices, including of real estate ('bubbles'). Neither was it preceded by the typical high credit-to-GDP gaps, and indicators like household leverage, debt service ratios, and financial valuations did not flash red. Relatedly, the banks that failed mostly – at least in the United States – continued to enjoy hefty revenues, solid growth and confidence, with limited signs of declining returns, excessive costs, funding issues, or rising risks detected by customers or markets.





The literature has recently revisited the origin of crises (as reviewed in Box 4.3), putting more emphasis on monetary policy. And in several ways, monetary policy did play a role this time, as we argue in five steps. To lay the ground, we chronicle the conduct of monetary policy in the United States over 2018-2023, also comparing it with the euro area. We then highlight commonalities, differences, and points of strength and vulnerability among the three failed US banks related to these monetary policy developments. Next, we consider monetary aggregates and balance sheet data, arguing that more attention should be given to these indicators, in conjunction with others) as they sounded warning bells before the failures. We end with lessons on how to use such indicators in the future, leaving policy recommendations for Chapter 5.

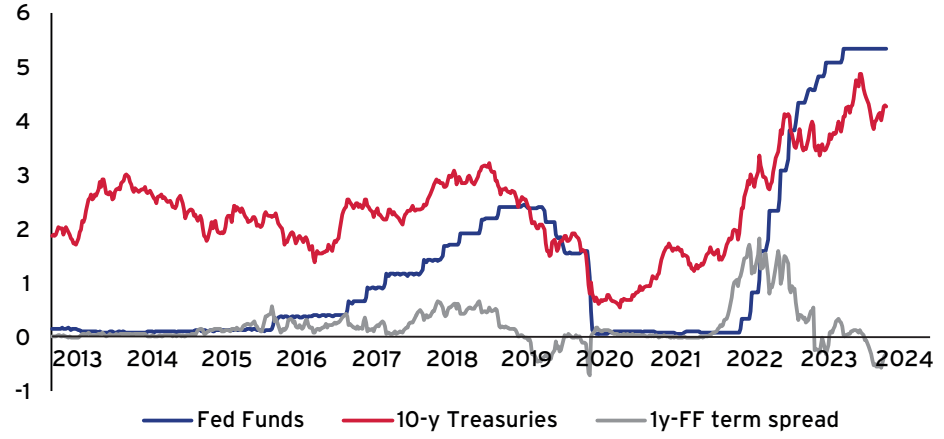
Our interpretation of the sequence of events partially contrasts with those provided by the two main federal supervisors – the FDIC and Federal Reserve. In short, we emphasise monetary policy (not noted by either supervisor) and argue that a prolonged period of extraordinarily expansive monetary policy, maintained even as inflation rose, followed by it becoming extraordinarily quickly restrictive, made for a lethal combination for banks. Our interpretation does not call for 'leaning against the wind' in all circumstances; rather, that it may be necessary at times. And it calls for considering more indicators than is typically done, combining macroeconomic and banking variables, since macro-monetary conditions, if extreme, can make banks unstable even if generally well managed and regulated.

### Monetary policy from 2013 to 2023

Figure 4.6 summarises US monetary policy over the last ten years using the Federal Funds rate, the 10-year Treasury yield, and the 1-year yield spread (1-Year Treasury rate minus the Fed Funds rate). After 2018, it shows three distinct periods: pre-COVID-19 pandemic (up to end-2019); the post-pandemic expansion (2020-2021, 'biennium'), and then the monetary tightening (2022 onwards). The pre-pandemic period is characterised by a strongly growing US economy and a gradual normalisation of interest rates. The 'biennium' saw interest rates at zero and very large sovereign bonds and other asset purchases by the Federal Reserve. That ended on 16 March 2022, when the Federal Reserve lifted rates by a quarter percentage point motivated by a strong economy, tight labour markets and inflation running "well above" the target. Interest rates were then raised in rapid succession by a further 500 basis points.

FIGURE 4.6 **US INTEREST RATES, 2013 TO TODAY**

Weekly averages ending Friday




Note: Weekly averages ending Friday
Source: FRED.

During the pandemic, policymakers focused on limiting damage to the economy and supporting livelihoods. Much focus was placed on helping banks, notably small and community banks with their borrowers, preventing company failures (especially SMEs), and limiting the adverse impacts on banks. Attention was thus mostly on banks' asset side, and less on funding and related liquidity and interest rate risks. Federal programmes such as the Paycheck Protection Program supported the economy and, indirectly, the banking sector. With interest rates exceptionally low, funding plentiful and government expansionary, banking conditions seemed generally good. But risks grew. Bank balance sheets became unbalanced as uninsured demand deposits grew fast, in response to QE and the low opportunity costs of investing elsewhere. Regarding the asset size, while credit risks remained steady, asset sensitivity to interest rate risk rose, especially at the banks that would soon fail.

### Developments at the three banks

Table 4.1 provides basic information for the three banks, before and during March 2023. All banks had a specific business model. SVB served venture capital firms and First Republic Bank catered to high net-worth individuals, while Signature Bank was more diversified. All had grown fast, especially in recent years, benefiting from an inflow of large (and therefore uninsured) deposits, in turn related to the monetary and fiscal policy stimulus and weak demand, something common to other banks. Then came the impact of higher interest rates: SVB had massive losses on its sovereign bond holdings; Signature as well, but less so; and First Republic's margins risked going negative as its deposits repriced while its assets – largely low fixed-interest-rate mortgages – did not.

TABLE 4.1 **A CLOSER LOOK AT THE THREE FAILED BANKS**

| | Year of founding | Region | Business model | Asset price (pre-crisis) | Asset growth (2019 to 2022) | Type/ extent of exposure | Unisured deposits pre-crisis | Securities portfolio loss | Size of deposit run | Date of crisis (peak) |
|---|---|---|---|---|---|---|---|---|---|---|
| **SVB** | 1983 | California | Venture capital firms | $209 bn. | 350% | Long-term Treasuries (strong) | 88% | 104% | -42% | Wednesday 8 March 2023 |
| **Signature** | 2001 | New York | Diversified retail | $74 bn. | 250% | Digital payments (moderate) | 67% | 30% | -20% | Friday 10 March 2023 |
| **First Republic** | 1985 | California | Diversified wholesale | $233 bn. | 180% | Diversified credit mix (moderate) | 70% | 20% | $100 bn. in 2023 Q1 | Friday 28 April 2023 |

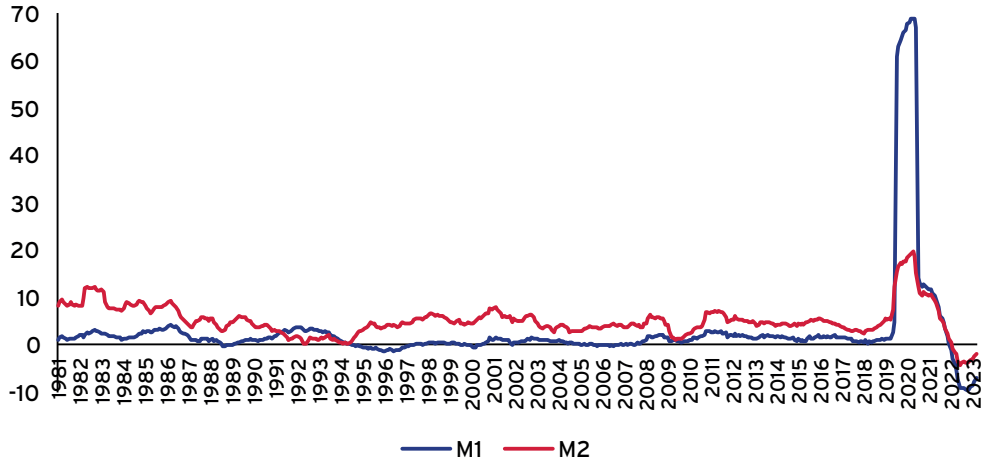
Source: FRB (2023), Gruenberg (2023) and FDIC (2023).

### Developments in monetary aggregates and balance sheets

Figure 4.7 shows the dynamics of M1 and M2 in the United States over the last 40 years, presented as ratios to bank assets to assess their impacts on bank balance sheets. It shows that while, historically, M1 growth to bank assets (the blue line) oscillated below 4%, occasionally going below zero, and on average being 1.2%, in the first half of 2020 it rose to nearly 70%, staying at that level for some time.

FIGURE 4.7 **M1 AND M2 IN THE UNITED STATES**

Yearly flows as a percent of bank liabilities




Note: Yearly M1 and M2 flows divided by total commercial bank assets, in percent.
Source/Notes: FRED.

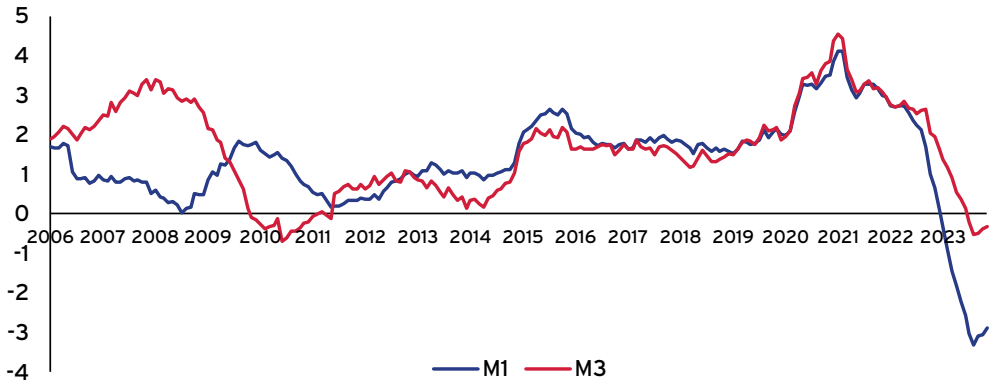
Several factors contributed to the explosion in M1 (and M2) in 2020. One was the sharp reduction in interest rates, which brought the opportunity cost of holding money back to zero, and the new wave of QE. Another was apparently minor regulatory changes: the elimination of reserve requirements on the most liquid components included in M1 and of the limits on the frequency of withdrawals on less liquid instruments included in M2 (FRED Blog, 2021). These changes enhanced the effects of the monetary policy expansion in terms of both M1 and M2. Additionally, the federal budget was particularly expansionary in the pandemic years, with many support programmes. The US federal government holds its cash largely with the Federal Reserve, as opposed to commercial banks, hence fiscal policy impacts bank deposits as well as monetary aggregates. Overall, the combination of the various monetary and fiscal expansions and actions meant large changes in banks' liabilities.

Figure 4.8 shows the corresponding developments for the euro area (note the difference in scale; the data go back only as far as 2006). While much less than for the United States (Figure 4.9), growth in euro area monetary aggregates was also unprecedentedly high during the pandemic years, peaking as a ratio to bank liabilities between 4% and 5%, against a pre-pandemic average of 2.5% for M1 and 2.8% for M3.



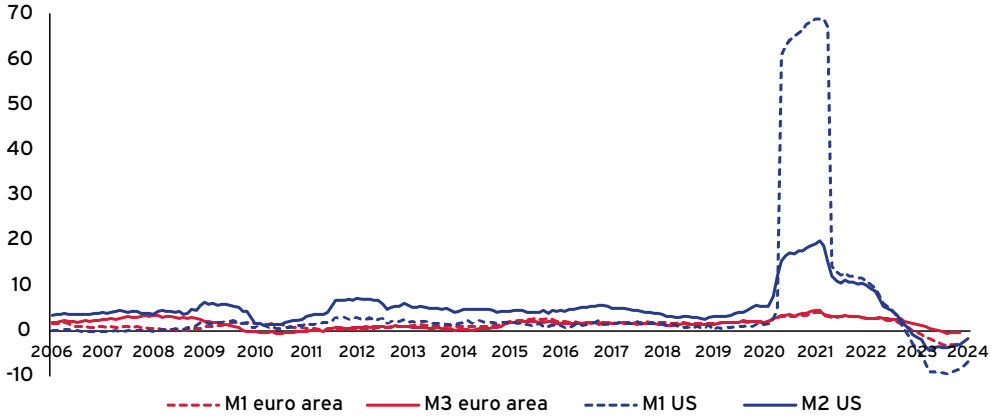


FIGURE 4.8 **M1 AND M3 IN THE EURO AREA**




Source: ECB.

FIGURE 4.9 **MONETARY AGGREGATES IN THE EURO AREA AND THE UNITED STATES**




Note: The peak value of M1 in the US is 68.9%.

Sources: Fred and ECB.

The large differences between the United States and the euro area can be explained by two factors. To start, the Federal Reserve mainly purchased securities from non-banks, using broker-dealers as counterparties, meaning asset purchases had a dollar-for-dollar direct impact on bank deposits (Acharya et al., 2023b). By contrast, the ECB mostly bought securities from banks, increasing banks' deposits with the central bank but not the public's deposits with banks. This made for a difference on impact, also because, in the short run, individual banks are largely quantity-takers in deposit markets (Tobin, 1982).

Over time, a second factor mattered. Individual banks can exert control over the deposits they receive by adjusting the conditions attached to them – mainly the interest rates and related services. For the banking system as a whole and in equilibrium, what matters too is the demand for money, which is a function of the opportunity cost of holding money and interest rate expectations. Here the difference in the lower interest rate bound and the QE strategy mattered. The ECB applied a negative rate on bank deposits between 2014 and 2022 (making it, given the ample reserves, effectively the key policy rate), with a low of -0.5% between 2019 and mid-2022. Importantly, it never disclosed its effective lower bound (ELB). By contrast, the Federal Reserve did not bring rates to (below) zero and made clear that it would not do so. There was, therefore, only one-way risk for the policy rate in the United States, but two-way risk in the euro area, which given a 'speculative' motive for money demand (Tobin, 1958), could help explain why money demand grew more in the United States.

Table 4.2 compares movements in key components of US banks' balance sheets between December 2019 to December 2021 and December 2021 to December 2022. In the first period, balance sheets increased by $4.8 trillion, or 27.9%, largely due to the deposit inflows. This increase was matched by higher loans (by a small amount, $$2.3 trillion, which includes central bank deposits), Treasury and Agency securities ($1.6 trillion), and a small residual. With demand for loans suppressed during the pandemic, the (unexpected) deposit inflow was allocated to 'buffer' assets: cash and government paper, the latter largely long-term.[37] Movements broadly match what happened at the three specific banks (see Table 4.1). Overall, in the pandemic period, the increase in monetary aggregates therefore impacted US banks' balance sheets in ways that they could hardly control, with little choice in adjusting their funding and asset structures.

In the subsequent period, when monetary policy started tightening, only part of the growth in the holdings of government paper by US banks was undone: deposits declined by just $0.2 trillion, public sector paper declined by the same amount, loans increased by $1.2 trillion, matched by lower cash. The deposit overhang inherited from the pandemic period thus persisted. Evidence actually shows that, in response to QE, US banks weakened their liquidity management over time (Acharya et al., 2024), making the effects linger on.

While the euro area adopted broadly similar interest rate increases (trough to peak, 5 and 4.5 percentage points, respectively), the growth in its money aggregates and impact on bank liabilities was more limited. It seems that euro area banks displayed less movements because the ECB's lower bound on its interest rate and QE policies differed from those of the Federal Reserve.

37 There is no breakdown between short-term bills and long-term bonds, but partly given 'search for yield' and as the T-bill market is too small to absorb such large inflow (about 10% of total US government debt was in form of T-bills), it had to be mostly long-term.

**TABLE 4.2 COMMERCIAL BANK BALANCE SHEETS: CHANGES OVER TWO TIME PERIODS**

| | Securities | … of which: Treasury and Agency | Loans | … of which: industrial | … of which: real estate | … of which: consumer | … of which: other | Cash | Total assets | Deposits |
|---|---|---|---|---|---|---|---|---|---|---|
| **2021-2019[a]** | 1.9 | 1.6 | 0.8 | 0.1 | 0.2 | 0.1 | 0.4 | 2.3 | 4.9 | 4.8 |
| **2022-2021[a]** | -0.2 | -0.2 | 1.2 | 0.3 | 0.6 | 0.2 | 0.2 | -0.9 | 0.3 | -0.2 |
| **2021-2019[b]** | 49.6 | 53.3 | 7.5 | 6.3 | 4.1 | 3.9 | 23.7 | 134.9 | 27.9 | 35.9 |
| **2022-202[b]** | -3.6 | -4.6 | 11.4 | 12.8 | 11.6 | 10.7 | 9.5 | -22.8 | 1.3 | -1.0 |

Note: End-December to end-December. [a]Flows expressed in trillion US dollars. [b]Percent changes.

Source: FRB (2024b).

### Post-mortem official reviews

This evidence suggests an interpretation of the events that deviates from the common one. In his testimony to Congress on 28 March 2023, FDIC Chairperson Gruenberg identified interest rate risk and the inadequate internal governance of the banks as causes. Monetary policy was not mentioned (Gruenberg, 2023). But there was a 'reach for yield', in that many banks bought long-term government bonds. While it counted as 'liquidity' for regulatory purposes – SVB's liquidity, for example, doubled from 5.7% of assets to 9.6% – it involved a large build-up of interest mismatches. The Barr Report from the Federal Reserve, a month later, did highlight failures at the bank as well in the Federal Reserve's own supervision. It noted that, at times, supervisors and the bank moved uncoordinatedly: notably in 2022, when faced with large deposit inflows and as supervisors belatedly raised concerns about risks, SVB actually removed interest risk hedges. Monetary conditions, however, were not noted as contributors to those risks, at least not before the turmoil. More generally, while central bank reports on unconventional monetary policies written before the March 2023 events (e.g., CGFS, 2019; 2023; Markets Committee, 2019; 2022) did note several (unintended) side effects of such policies, effects on bank funding structures were not highlighted.

### Lessons

The banking turmoil of March 2023 in the United States would not have happened without the massive inflow of deposits, which was in part a direct consequence of the monetary policy pursued. Deposit inflows of such magnitude are hard to control by banks; individual banks do just not turn away depositors bringing more money, and the banking system as a whole has to accommodate the effects on deposits from the central bank's asset purchase programmes. The experience in the euro area provides a counter-example to this. Equally clear, however, is that the events in the United States would have been much less likely and far less consequential had the banks been more cautious in their risk management and their supervisors more alert and proactive, forcing individual banks to be more conservative. Detailed policy implications are presented in Chapter 5.

#### BOX 4.3 MONETARY POLICY AND FINANCIAL STABILITY: BACKGROUND CONCEPTS

The question of whether and how monetary policy can contribute to financial stability is old and often revisited. Actually, the origins of many central banks arise from bouts of financial instability. Early central banks like the Swedish Riksbank (founded in 1668) and the Banque de France (1800) originated, in large part, from a desire to avoid the repetition of the episodes of banknote over-issuance that had led to bankruptcies and monetary disorder in the respective countries. For the Federal Reserve (1913), the purpose of having an 'elastic currency' which would prevent banking panics was even more explicit to its founding (Barr, 2023). Based on historical experiences, Padoa Schioppa (2002) concluded that financial stability is part of the 'genetic code' of central banks, a statement which was meant primarily to emphasise the involvement of central banks in banking supervision, because of the link between supervision and lending of last resort.

BOX 4.3 **(CONTD.)**

In spite of these precedents, before the GFC the prevailing view among academic economists was that the pursuits of price and financial stability should be kept separate, the first being the goal of the central bank, the second to be attained by prudential authorities. The two functions were intended to be disjoint in two institutions, or at least separated by effective firewalls if hosted in a single institution. Each should have its own instruments, rules and accountability frameworks. Some went further, claiming that pursuing price stability was the best way to ensure financial stability as well. Along these lines, Bernanke and Gertler (2000) argued that "... flexible inflation-targeting provides an effective, unified framework for achieving both general macroeconomic stability and financial stability. Given a strong commitment to stabilizing expected inflation, it is neither necessary nor desirable for monetary policy to respond to changes in asset prices, except to the extent that they help to forecast inflationary or deflationary pressures." Later, Bernanke (2022) stated the separation principle as follows: "Use the right tool for the job".

Around the same time, however, Andrew Crockett (2001), General Manager of the BIS, advocated for monetary policy to be involved in the pursuit of financial stability: "... at a minimum, it seems reasonable to suggest that, in formulating monetary policy aimed at an inflation objective, central banks should take explicit account of the impact of financial developments on the balance of risks." On how to do this, Crockett was quite specific: "it might be appropriate for the authorities to aim for price increases in the lower part of the target corridor, or else to aim at a slowing in the overall rate of credit expansion. In particular, rapid credit growth should prompt the central bank to look extra hard for inflation risks." Here, "look extra hard" should reasonably be intended to mean reacting more promptly and/or more forcefully to those risks.

The GFC further influenced this debate, moving the balance of opinions more towards the involvement of monetary policy in financial stability. The reason was a broad-based perception that the financial exuberance that had preceded the crisis, and to a significant extent caused it, was not only accompanied but actually fuelled by the accommodating monetary stance prevailing globally and in particular in the United States. The tilt in the balance, however, did not produce a consensus on how such involvement should take place. Still, post-GFC, the academic literature has provided important analytical input to this debate and related actions, along four strands.

The first was to produce much evidence showing that the stance of monetary policy influences the propensity to assume risk – the easier the stance, the more risk economic agents (individuals, banks, portfolio managers) are inclined to bear. Many agree now on the relevance of the 'risk-taking' and 'search for yields' channels of monetary policy, with evidence including econometric tests (e.g., Altunbas et al., 2010), survey evidence (Maddaloni and Peydró, 2011), model simulations (e.g., Angeloni et al., 2015; Faia and Karau, 2021 ) and experimental results (e.g., Zijlstra and Ma, 2018).

The second consisted of analyses showing that, in models explicitly including endogenous banking crises and a bank lending transmission channel, monetary policy and capital regulation perform complementary roles in attaining price and financial stability simultaneously. Using both in a coordinated way allows one to attain superior outcomes. This line of work includes, among others, Angeloni and Faia (2013) and Abbate and Thaler (2023). Greenwald et al. (2024) study the interaction between the two for the recent case in the United States. They show empirically that banks that experienced larger losses on their securities during the 2022-2023 monetary tightening cycle extended less credit to firms. And they confirm in a structural model that interest rate transmission is stronger the more banks are required to adjust their regulatory capital for unrealised value changes of securities.

BOX 4.3 **(CONTD.)**

Jeremy Stein (2013) singlehandedly contributed a third line of argument in an influential speech delivered as a member of the Federal Reserve Board. Stein noted that monetary policy can be uniquely effective in maintaining financial stability by prevent overheating in financial markets, because "... while monetary policy may not be quite the right tool for the job, it has one important advantage relative to supervision and regulation--namely that it gets in all of the cracks. The one thing that a commercial bank, a broker-dealer, an offshore hedge fund, and a special purpose ABCP vehicle have in common is that they all face the same set of market interest rates. To the extent that market rates exert an influence on risk appetite, or on the incentives to engage in maturity transformation, changes in rates may reach into corners of the market that supervision and regulation cannot". Conditional on the existence of risk-taking behaviour, Stein's by now famous 'cracks argument' provided a powerful counterweight to views according to which monetary policy is less effective than prudential regulation as tool for maintaining financial stability.

The fourth strand, developed largely within the BIS, produced a stream of influential empirical papers studying the characteristics of macroeconomic and credit cycles around financial crises. In particular, Borio and Drehmann (2009), and more recently Aldasoro et al. (2018) and Borio et al. (2019), identified patterns that regularly precede crisis episodes, among which prominently are credit booms, large property price increases, and equity price booms. Indicators, including credit/GDP gaps and measures of 'excessive' appreciation of property or equity markets, which help predict crises have become standard monitoring tools for central banks and macroprudential authorities. However, these indicators per se do not imply that monetary policy should necessarily lean against the wind. This is one possible interpretation (Borio and Zhu, 2009), but others are possible, for example, relying on counter-cyclical macroprudential instruments.

A separate issue is how an active role for monetary policy in maintaining financial stability can be reconciled with existing central bank charters. Different institutional settings matter here. The Federal Reserve, with its dual mandate (maximum employment and price stability) and using its 'third mandate' of moderate long-term interest rates, has more leeway to bring financial stability into monetary policy. A recent statement by Barr (2023), the Vice Chair for Supervision, leaves little doubt that the Federal Reserve regards financial stability as essential for the pursuit of its (at least, dual) mandate. For the ECB, with its single mandate of price stability, the integration is harder, though not completely off; past experiences demonstrate that financial crises can mean deflationary risks. As part of its 2021 monetary policy strategy review, the ECB revisited the matter, but the outcome (ECB, 2021) arguably falls short of providing clarity on whether financial stability actually enters into its strategy and how.

# CHAPTER 5

# Overall diagnosis and recommendations



Important parts of the global banking sector were hit once again by major stresses in March 2023. The encouraging news was that, thanks to post-GFC reforms, the banking systems on both sides of the Atlantic stabilised quickly. But it took large public interventions, in various ways, and left bad legacies in terms of once again needing government bailouts. In terms of lessons, the events made clear that some reforms had lagged and, in some cases, even gone into reverse. Here, the simple lesson is to do better. But the events also taught that the reform programmes remain incomplete as important new risks emerged and old, but forgotten, lessons were reconfirmed. This was notably so on the need for proper liquidity management at both the bank and system levels and the necessity to coordinate better monetary and financial stability policies and actions. These and other lessons apply to both the United States and Europe (the European Union, the United Kingdom and Switzerland), but in different ways. Accordingly, our policy recommendations differ in detail, but are common in spirit and all urgent as the costs of not acting are large in both jurisdictions.

## 5.1 DIAGNOSIS OF REFORMS TO DATE AND LESSONS LEARNED

1. **Reforms helped.** In the United States, the crisis would likely have been worse and recovery more extended had capital and liquidity buffers been less strong, as they were before the GFC. The post-crisis reforms also provided the Federal Reserve and the FDIC with the intervention tools that proved crucial at the peak of the turmoil to defuse systemic risk. In the European Union, the fruits of the post-crisis reforms were evident too. The Single Supervisory Mechanism, covering all euro area countries, strengthened prudential buffers, cleaned up balance sheets and built more effective and transparent supervision. This allowed euro area banks to navigate the turmoil virtually unscathed. And in Switzerland, the sector overall proved not only resilient but supported the authorities in managing the failure of a very large bank, Credit Suisse.
2. **More reform is needed.** It is equally evident that the reforms so far fell short of what was planned. Recent actions in the United States amounted to a weakening of post-GFC supervisory standards (the decision in June 2019 to exempt banks with assets between $100 billion and $250 billion from stress tests and ease their liquidity and capital requirements is a well noted, but not the only example). Even

worse, the United States is not yet on track to adopt the Basel III endgame, and recent official statements suggest some serious backtracking. In the European Union, the Banking Union remains incomplete; only one of the three 'pillars' announced in 2012 – supervision – is up and running satisfactorily, the single euro-wide deposit insurance seems postponed forever and the resolution framework, never truly tested, is undergoing a major refurbishing subject to a multi-year approval process (see also Veron, 2024). Crucially, the Banking Union never became a single market: banking in the euro area is as fragmented along national lines as it was before 2012, maybe even more so. To have a genuine Banking Union requires changes going beyond regulatory harmonisation and more work on crisis management. While Switzerland had implemented many reforms in line with the FSB Key Attributes for effective resolution regimes, the first test case showed the lack of a mechanism to secure funding. It also made clear that a global resolution needs legal certainty on the treatment of bail-in in key foreign jurisdictions, to avoid questioning the entire structure of loss absorption in gone concern. And the fear of contagion remained large, even in an idiosyncratic case, casting doubt on the feasibility of bail-in resolution and thus on the entire 'too big to fail' framework built after the GFC.

3. **New lessons emerged and old ones were confirmed**. The turmoil in the United States showed once again that monetary policy, interacting with other factors, can affect financial stability, but this time in new ways. A rapid shift from the extreme and prolonged expansionary monetary policies under QE and during the pandemic to the sharp and unexpected tightening of interest rates and a start of QT contributed to destabilising banks, especially those whose deposit funding had grown fast. Concurring factors were, no doubt, banks' weak risk management and poor governance practices that were tolerated by supervisors. Yet, the turmoil would not have happened how it did had monetary policy been less extreme in both phases. Analysis of monetary aggregates and balance sheet data show that the system and many banks (not only those that failed) received massive inflow of deposits between 2020 and early 2022. These deposits were often large, and therefore uninsured, and more than banks could productively lend out. With the excess invested in, besides central bank deposits, long-duration Treasury (including Agency) securities, banks became extremely vulnerable to interest rate risk. At the time few, in private and official circles alike, expected the sharp and sudden interest rate increase, but it should have been analysed in a stress scenario. More generally, events showed monetary and financial stability policies were still poorly integrated. Euro area banks, largely immune from the turmoil, provide counterfactual evidence of the relevance of monetary factors in destabilising banks. Comparable developments did in fact occur there too, but much less extreme, thus avoiding extreme liquidity mismatches and bank failures.

## 5.2 RECOMMENDATIONS

Our recommendations, chosen based on priority, cover the common issue of the need for greater coordination of monetary and financial stability policies, address key specific challenges for the United States and Europe, and develop options for recovery of weak banks and making orderly resolution of large G-SIBs feasible. While global financial markets are calm as we write, most of the vulnerabilities and potential triggers of turmoil have not disappeared, making bank instability again realistic. Even after a significant monetary tightening, financial conditions in the United States are actually not materially different now than before the turmoil. And while European banks have solid capitalisation and benefit today from higher net margins, their valuations remain below those of US banks. Structurally, little has changed as regulatory reforms are just being discussed and most bank, supervisory and other adjustments are yet to come. This combination does not necessarily signal impending turmoil, but financial and economic conditions could change quickly, and regardless policy needs to provide more coherently the overall direction. The most urgent reforms are integrating financial stability considerations more into monetary policy and operations, which could start with monetary policy decisions in the near future; more quickly fostering integrated banking markets by adopting the European Bank Charter; conducting a liquidity-based stress test in the United States with required equity injections; and enhancing the G-SIB resolution and recovery frameworks.



### 5.2.1 Monetary and financial stability policy coordination

A prominent lesson for both the United States and Europe is how costly the poor integration of monetary and financial stability analyses and policies, including prudential, in relevant organisations in the run up to the crisis was. Some integration could have taken place as part of macroprudential policy. But, if it happened, it was likely limited to traditional instruments (such structural and cyclical capital buffers, loan-to-value limits and the like). Coordination should be much broader. While some financial stability analysis likely featured work on the role of monetary policy in fostering risk-taking in lending and subsequently leading to distressed assets, it largely ignored what monetary policy meant for bank funding structures. And most financial stability analysis did not seem to have fed into monetary policy decisions. Analyses and policy interactions should be two-way, with monetary policy affecting micro- and macroprudential decisions and monetary policy considering all its financial stability implications, given prudential choices.

Specific recommendations relevant for central banks and prudential authorities include:

1. **Greater integration across policy domains**. Within central banks, analytical and decision-making processes for monetary, financial stability and supervisory policy should be better integrated. Analyses related to the interactions between monetary policy and financial stability should be routinely conducted and brought to relevant policymaking committees (e.g., the Federal Open Market Committee,

the ECB Governing Council and Executive Board). Preserving the necessary independence in decision making, analyses of possible effects on financial stability should enter explicitly and systematically into monetary policy preparations, and vice-versa, analyses of the possible effects on monetary policy should enter into financial stability decisions, including microprudential and macroprudential, and supervisory and bank internal stress tests should explicitly consider implications of alternative monetary policy paths, including extreme ones.

2. **Decision makers' skills and accountability processes should better reflect the interactions**. Competencies of committee members and other decision makers need to include skills in both monetary policy and financial stability, and their interactions. Policy committees should have overlap in membership and display a mix of cross-disciplinarity skills. Monetary policy decision makers should be equipped to discuss financial stability implications explicitly, and vice versa, and both domains should assess the joint impact of policies. Decision processes should have specific accountabilities for the interactions. At the same time, monetary policy and financial stability need to have their own independent accountability processes, also to avoid conflict of interests.

3. **Communication of decisions should reflect the interactions**. Analyses and debates among decision makers – including differences in views – should be transparently communicated. Financial stability implications should become part of central bank monetary policy communication, calling them, when necessary, to the attention of banks and other intermediaries. In monetary policy press conferences, more active participation by financial stability officials – for the Federal Reserve, the Vice-Chair for Supervision; for the ECB, the Vice President – is advised.

4. **Internal coordination and staffing can be better**. Obstacles limiting interdepartmental professional interaction and information exchanges should be re-examined and as much as possible be removed. Similarly to at the decision-making level, data and analyses on monetary policy and financial stability should be shared at the staff level as the norm, while safeguarding necessary data confidentiality and avoiding conflict of interests. In recruitment, a multidisciplinary background in relevant areas should be counted as an asset. Mobility of staff across monetary policy and financial stability units should be favoured.

5. **More and better analyses and data on interactions are needed**. Analyses should consider explicitly the interactions between monetary policy and financial stability. Macro-financial analyses, including econometric modelling of monetary–financial interactions, should be the norm. Macroprudential and microprudential assessments should consider the effects of monetary policy choices and implications for financial stability. Issues analysed should include factors affecting money demand and supply – returns and opportunity costs to hold deposits, central bank

intervention modalities including counterparty and collateral policies, and how banks' liquidity management relates to monetary policy. Relevant data to be used include balance sheets, monetary aggregates, securities statistics, flow of funds (including security type and holdings), and non-bank intermediary data.

6. **Adapt monetary policy decisions in content, communication and accountability**. Monetary policy should be timely given macroeconomic and price developments to limit those abrupt adjustments harmful to financial stability that are necessary when action is delayed. If consistent with the primacy of price stability, monetary policy should avoid excessively rapid tightening or loosening to allow banks and financial markets time to adapt. Planned interest rate paths to be decided on should, if feasible, include intended endpoint interest rates. To the extent possible, central banks should communicate on endpoint rates, noting the contingency on available information and associated uncertainties.

7. **Calibrate prudential policies to monetary policy choices.** The calibrations of countercyclical macroprudential requirements should take the monetary policy cycle, including monetary aggregates, into account, in addition to customary variables such as credit gaps, asset prices, and so on. Microprudential and macroprudential attention should include the liability side of banks, an aspect lost in recent decades with academic researchers and central bank analysts tending to concentrate on bank assets, in particular credit exposures with their determinants and characteristics. More stringent liquidity requirements and prepositioning of collateral are useful, but they should have a countercyclical dimension, not just a structural one.



### 5.2.2 Banking regulation in Europe

While the EU Banking Union is mature from a supervisory viewpoint, two shortcomings remain: large banks have never expanded euro area-wide; and while many small and medium banks have legacy issues, their crisis management framework remains incomplete and ineffective.

*Euro area-wide banking*

Banking is far from fully integrated in the euro area, in contrast to its unified legislative and supervisory systems. A fully integrated euro area-wide banking system is necessary to support the increasingly European integrated economy. It also complements the integrated capital markets the European Union aims at with its Customs Market Union project. The failure to attain integration, ten years after the onset of single supervision, signals the need for bolder regulatory actions, moving beyond incremental reforms aimed at harmonisation. Achieving it requires a stand-alone, coherent set of rules based on the overarching principle of operating across borders in the Banking Union 'blind' to country-specific regulation, supervision and crisis management. This calls for adopting a 'European Bank Charter' reserved for those financial institutions able and willing to be active across borders and satisfying a set of qualifying prudential and structural

characteristics. The charter proposed therefore encompasses a set of structural and prudential criteria to be satisfied by those banking groups that conduct, or realistically aspire to conduct, substantial euro area-wide business. It would require legislative changes at four levels:

1. **Fully liberalising intra-group movements of capital, liquidity and other resources.** Provisions in European banking law – directives and regulations – that prohibit or severely limit intra-group movement would not apply to a (restricted) class of cross-border institutions. And nation-based supervisory actions that amount to ringfencing would be prohibited for these groups.

2. **Strengthening intra-group capital and liquidity support**. Provisions governing the internal support in case of distress within those groups would be established and made mandatory and enforceable, both before and after the entity (whole group or subsidiary) reaches the point of non-viability.

3. **Placing cross-border groups under exclusive European jurisdiction**. Cross-border groups and their entities, if declared in a state of failure by the supervisor, would be resolved and if necessary liquidated by the European authority (the SRB) and according to European rules, not nationally.

4. **Severing links between cross-border banks and national DGSs**. Deposit insurance functions for these groups would be performed by a dedicated scheme, contributed to by the groups themselves, separate from the existing deposit insurance and supported by a European public backstop.

*Crisis management*

The second key reform area is crisis management for mid-sized banks. This has recently been the object of much study (e.g., Acharya et al., 2024) and some policy action (European Commission, 2023a). Most observers and authorities concur that the resolvability of small- and mid-sized banks needs strengthening on multiple fronts: enhancing resolution funding and facilitating access to it; empowering European authorities, primarily the Single Resolution Board, by granting it new powers and instruments; strengthening supervisory actions at an early ('recovery') stage, i.e. before the ailing bank reaches the point of non-viability; and centralising, to the extent possible, deposit guarantee funds. In April 2023, the Commission tabled a comprehensive legislative proposal on this. Overall, we support the proposal though it could have been more ambitious in certain respects, notably as to anticipating some of lessons now even clearer regarding recovery and resolution for G-SIBs (see Section 5.2.4). The main concerns are not its shortcomings but rather that, since the Commission had to make compromises, it may be further watered down and have a long approval process ahead. Both are problematic since these 'middle class' banks still face significant vulnerabilities and weaknesses (see Section 5.2.6).

### 5.2.3 Banking supervision and regulation in the United States

*Liquidity and capitalisation*

Today, the United States has a banking system with many potentially insolvent banks together with many solvent but illiquid banks. This mix makes it even more important to put the post-GFC agreed reforms in place, notably Basel III, for all types of banks to ensure they have solid capital and liquidity positions. But Basel III may not suffice and anyhow it will take time (and political will). To save taxpayers from losses arising from confidence crises affecting many banks, a 'market test' could help separate insolvent banks from solvent but illiquid banks. In short, banks would be asked to promptly raise equity or other private or public capital. The extra capital will reduce fragility, and asking for it will provide a real market test to identify truly solvent but illiquid banks from insolvent ones. If banks are judged not to be able to raise equity right away for various reasons, the regulators would instead carry out a stress test so that the market can get a sense of which banks are solvent and which are insolvent. This will also help regulators craft a plan to consolidate or merge insolvent banks.

The realism of this proposal depends on how much additional equity might be needed. DeMarzo et al. (2023) estimate that additional equity of between $190 and $400 billion would suffice to prevent bank runs, given the potential insolvency in the banking system.[38] This number is relatively small compared to the supply of risk capital: there is over $3 trillion dry powder in the private equity industry alone. In contrast, resolving all endangered banks' assets would require over $2 trillion in support. Reducing the supervisory fragmentation would be another important complementary step to strengthen bank oversight.

### 5.2.4 G-SIB resolution and recovery

*Fix resolution, the endgame*

The post-GFC reforms are meant to assure that globally active banks are not too big to fail – they should be resolved in an orderly manner across borders without causing major stress. The Credit Suisse case showed that reforms remain incomplete in technical feasibility and lack the credibility of a bail-in resolution. To achieve a credible 'endgame', the TBTF architecture needs, at a minimum, to:

38 To derive these numbers, they calculated the 'coverage ratio' for each bank, the gap between a bank's liabilities and assets after accounting for mark-to-market losses. Banks with a negative coverage ratio would be unable to satisfy deposit claims and FHLB loans with their mark-to-market assets. As shown in Figure 3.29 in Chapter 3, 1,926 banks have such a negative coverage ratio. Making them whole requires equity of $189 billion in total, or $98 million per bank. Raising the coverage ratio to a safer range (e.g., 5%) would require $400 billion in new capital. This analysis is broadly confirmed by others using more recent data. For example, Doolittle et al. (2024) identify 185 banks with $524 billion of assets that, as of Q4 2023, had unrealised securities losses that exceeded their shareholders' equity. In addition, they show that these banks are likely to have significant commercial real estate loan losses.

1. **Assure a mechanism for sufficient funding is in place**. The home jurisdiction of any G-SIB needs to ensure that funding in resolution is robust. The lender of last resort should be prepared to extend emergency liquidity assistance against a wide range of collateral and be able to mobilise liquidity in foreign currency at short notice. In resolution, a 'wall of liquidity' must be in place to discourage depositors from withdrawals or to contain an ongoing run. This likely requires a fiscal backstop, which is currently lacking in most G-SIB jurisdictions.

2. **Broaden the spectrum of resolution options**. Currently, resolution needs to be finalised very quickly ('over a weekend'). This limits the number of options that can be pursued (for example, a merger or sale of parts of the distressed institution may be a preferable to a bail-in but typically requires more time). Allowing a bridge bank, controlled by the resolution authority, would open up additional options.

3. **Test G-SIB resolvability with all concerned parties**. In any G-SIB resolution, multiple jurisdictions will be concerned. Even if the institution has a small presence in a jurisdiction, indirect contagion effects might still be of concern. Therefore, resolvability should be regularly tested and discussed beyond the crisis management group, and with all authorities and (political) decision makers that may be involved in a resolution. Educating the public on TBTF regulations would also be helpful.

4. **Ensure legal certainty of foreign bail-in in all relevant jurisdictions**. To make bail-in resolution a viable option requires a process through which all relevant jurisdictions can provide ex-ante assurance that they will accept foreign bail-in and enforce conversion of bail-in bonds instantly.

5. **Clarify and standardise Additional Tier 1 (AT1)**. AT1s are supposed to be going concern capital, but in practice they are more used in gone concern situations. To rectify this, the capital trigger should be high to lead to automatic recapitalisation before capital is running low. A discretionary trigger should secure additional capital in case of a viability event with possible public support. To qualify as AT1, such instruments should be perpetual and interest payments at the discretion of management.

6. **Carry out stress tests and scenario analyses as to intra-group capital and liquidity fungibility**. These should analyse the possibility of capital and liquidity being trapped and take action to reduce such frictions.

*Design a special recovery regime*

Ideally the endgame should be credible but never tested. But current practices suffer from incentive problems among banks, supervisors and market participants. To make recovery an effective tool calls for a special regime combining clearly bound activation, and thus legal certainty, greater corrective action powers for supervisors and mechanisms to prevent the risk of run and avoid broader contagion:[39]

1. **Binding triggers**. Activation of the special recovery regime should be quasi-automatic, based on a well-defined set of indicators, and leave only limited room for supervisory discretion. Capital should be the primary trigger, while secondary triggers to cover other fragilities could include market-based indicators or significant liquidity events. To be credible, the triggers should be largely observable by markets; however, supervisors should retain the option to override the activation, in which case they would have to explain their choice.[40]

2. **Supervisors equipped with sufficient powers and instruments to change the bank.** In the recovery regime, supervisors should have intervention powers that go beyond those available in the normal regime. Supervisors may suspend calling AT1 and suspending interest payments. The bank needs to be viable going forward, which likely requires correcting flaws in its management. Supervisors should be able to take all actions, including possibly changing management or the board, to assure flaws are corrected and the bank is sound in the long run.

3. **Mechanisms to mitigate the risk of runs and reduce consequences if they were to occur.** Triggering the formal recovery regime can lead to runs. To manage these, supervisory actions may be needed which can include imposing (flat) redemption charges for large withdrawals (like MMFs).

### 5.2.5 Other important and complementary reforms

Causes of the events have been identified by many other observers. Work to address deficiencies is already underway in many jurisdictions and globally – see, for example, FSB (2024) on the general reforms and BCBS (2023a) specifically on prudential regulations that need revisiting.[41] And many different changes have been proposed and noted in reports published recently (e.g., Acharya et al., 2023d, 2024; Group of 30, 2024). We do agree with most suggestions, as some proposed overlap with ours while others advocated are necessary and complementary to ours. We do not comment on these other reforms

39 See further Perotti and Martino (2024) and Weder di Mauro (2024), on which this section draws.

40 The first formal intervention regime was the Prompt Corrective Action (PCA) introduced in the US in 1991. It is triggered by a breach of a capital threshold and foresees mandatory recovery actions. The EU Early Intervention Measures (EIM), adopted in 2014, has a broader set of triggers and greater discretion. It is being revisited.

41 Banking regulations need continuous adaption to changing circumstances and actual bank behaviour. For example, the BCBS has a proposal out for consultation (BCBS, 2024c) to change the rules for calculating the capital surcharge applied to G-SIBs to address window dressing by moving from using end of period to average data. On interest rate risk in the banking book, an updated standard was issued in July 2024 (BCBS, 2024d).

(we refer to the other analyses for details) but summarise them here into two groups: those that aim to reduce the build-up of vulnerabilities and the risks of stress occurring in the first place; and those that aim to improve the modalities for crisis management (the following section draws on the Group of 30 report).

The first group includes the following. Changes to the accounting rules are necessary in the United States to make financial reports, and disclosures more generally, better reflect the banks' true position, notably as to the recognition of (interest rate related) valuation losses in income for smaller and mid-sized banks. More generally and globally, there is much scope to improve bank disclosure to at least allow for greater market discipline, understanding that this discipline is hard to achieve in practice. In the United States, there is also a significant need to enhance and harmonise more across types of banks prudential requirements, notably to ensure that there is an adequate capital requirement for interest rate risk in the banking book for all banks.[42] In the European Union, but not only there, some changes to the corporate governance of banks can be helpful in improving banks' management. In all jurisdictions, bank liquidity management needs to be enhanced, including by raising the so-called run-off ratios (as used in the Liquidity Cover Ratio, or LCR) for different liabilities.[43] This would have to done, however, considering the deadweight costs of banks holding larger amounts of HQLA.[44] And it may be a less efficient solution than raising capital adequacy requirements. Besides the specific improvements to supervisory arrangements suggested for the United States and the European Union, supervisory agencies need bolstering. Agencies need the powers, resources and right governance to be able and incentivised to detect emerging risks in a timely manner, including through stress tests, to follow up with disciplinary actions on banks (that are required and penalised if not made), and, if necessary, restructure or resolve weak institutions, including those with low franchise values.

The second group includes the following. As to the lender of last resort, improvements are urgently needed in the United States and in some other jurisdictions to deal with the more rapid outflows of deposits and other liabilities. An LOLR that is effective in providing liquidity rapidly in case of stresses, which in the United States would include the removal of the stigma of using it, reduces the risks of contagion and provides more time to organise a restructuring of the bank (see further Group of 30, 2024; and Tucker, 2023, as to the Swiss case). Well-designed, which would include requirements for banks to preposition some collateral at the central bank, an LOLR can be an incentive for banks to improve their liquidity management. As to deposit insurance, the more rapid pace of runs should be reflected. This could mean for some jurisdictions a review of the deposit

42 While all banks should be subject to some capital charge, there could be some adjustments in the specific rule by, for example, size or complexity of the bank's businesses.
43 The run-off ratios used are likely under revision given events. Aldasoro and Faia (2016) find that a uniform LCR may have detrimental financial stability effect by impeding the efficient redistribution of liquidity across heterogeneous banks, making differential requirements based on balance sheet characteristics advisable.
44 It may also consider any changes to the LOLR. Specifically, besides funds available from selling HQLA (possibly adjusted for its liquidity), the LOLR, although meant more for times of acute stress, could also make funds available.

insurance coverage and design, notably as to the size of corporate transaction deposits (e.g., those used for salary payments) covered and the level and structure of insurance premiums. But greater and higher coverage of deposit insurance undermines market discipline, notably as a bank approaches failure (e.g., Martin et al., 2023). As the final goals of the deposit insurance scheme remain the same, any changes will need to strike a balance between, on the one hand, increasing moral hazard, and on the other hand, mitigating the risk of runs.





### 5.2.6 The risks of not acting

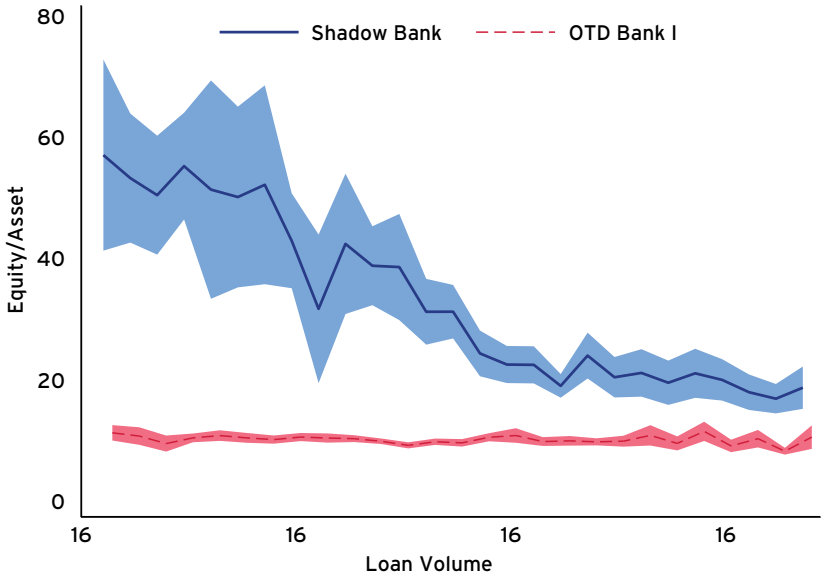
The consequences of not acting are many, hard to predict and vary by jurisdiction. But they can include a repeat of events last year as well as structurally poorly performing financial systems.

*United States*

Currently, as shown in Chapter 3 and noted above (Section 5.2.3), many US banks already need to raise capital to cover their existing losses. In a perfect storm of tighter financial conditions, larger valuation and real estate losses, and adverse confidence shocks, more banks will have such a de facto negative capital position and face possible liquidity runs. Authorities are surely closely reviewing the viability of all their banks, but risks remain and a repeat of the events of last year cannot be ruled out unless, as suggested above, the authorities pre-emptively take actions to force equity injections. Otherwise, they once again may have to dramatically expand the public safety net.

What about the long-run future of banking? With the sector increasingly facing shocks from unanticipated directions, it would be prudent for all banks to internalise more of the risks they take by having higher equity buffers. The worry frequently voiced is that this would deteriorate banking services (the argument banks frequently raise in opposition to the Basel III endgame). But some evidence suggests that this is overstated. Figure 5.1 plots amounts of (bank and non-bank) lending in the $12 trillion mortgage market on the horizontal axis. On the vertical axis, it shows the equity-to-asset ratio for traditional deposit-taking banks, with their large, government subsidised liability structure (the orange line) and that of the shadow banks or non-banks, which are largely funded by uninsured debt (the dark black line). It makes clear that non-banks have substantially higher equity than banks do, while both segments provide the same intermediary services. The reason is intuitive: the market forces non-banks to have higher equity because they have a substantial proportion of runnable uninsured debt, but no direct access to the public safety net. Thus, while providing similar services as traditional banks, they need significantly more equity capital to account for their higher runnable risk of uninsured debt.

FIGURE 5.1 **WHAT ABOUT REGULATING THE BANK IN THE LONG RUN?**




Note: The black line plots the equity-to-asset ratio of shadow lenders (i.e., nondepository institutions) providing mortgages to US households. The orange line plots the equity-to-capital ratio of traditional banks providing the same service. The lending volume of various institutions is on the x-axis, and the y-axis plots the equity-to-assets ratio.

Source: Jiang et al. (2020).

This comparison shows that having more equity does not immediately hamper intermediaries' services. Of course, this is just based on provision of mortgages. Other services that traditional banks provide might necessitate more debt. But what these services are and how much additional debt (instead of equity) might best be provided to these services remain open questions. Until then, it seems prudent to think that the answer to financial stability may not be tinkering with regulations or adding more liquidity requirements, but rather asking traditional banks to have a significant amount of equity capital to internalise more of the risks they take (Admati and Hellwig, 2014; Seru et al., 2023; Seru, 2023b).

*Europe*

In the euro area, the failure so far of the Banking Union to attain a genuine single banking market is costly, as argued in Chapter 4. Over time it may even endanger the progress achieved on the prudential side, with the establishment of the SSM, because the existence of a centralised supervisor is harder to justify if banking markets remain fragmented nationally. For these reasons, we advocate forceful actions specifically aimed at unblocking banking cross-border integration.

The main risk if crisis management does not progress significantly and rapidly is the emergence of zombie banks. These are institutions that, though close or maybe even beyond the point of non-viability, remain active. They lack buyout opportunities and survive by relying on ample public support and a reluctance of the authorities to act in a timely manner or otherwise to intervene. A stable and efficient banking sector is indispensable

for the adequate financing of the real economy. This applies even more so for Europe as bank financing remains the primary funding source for firms: a quarter century after the introduction of the euro, European firms are as dependent on bank credit as before. Reforming capital markets would help, but the Capital Markets Union project remains a blueprint. And if it succeeds, the highest-quality and transparent firms will leave for the capital markets, since they do not require significant screening or monitoring, lowering the quality and profitability of the marginal bank borrower and making the emergence of zombie banks more likely.

The extent of the zombie bank phenomenon and its development are hard to judge. The more rigorous supervision and more effective and transparent – though far from perfect – resolution over the last ten years, thanks to the Banking Union, have greatly reduced the presence of zombie banks. But it is conceivable that there are still zombie banks and firms out there and that new zombies will emerge (for a review, see Acharya et al., 2022). The pandemic crisis and the slower economic growth have certainly meant losses in credit portfolios, parts of which still have to crystallise. One indication is that most euro area banks' stocks still trade well below book values. This is a long-standing feature (ECB, 2019), and it persists despite the increased profitability recently of euro area banks due to their higher margins. Chart A in ECB (2023), and related discussion, attributes the low valuation to the high cost of capital, in turn caused by a high equity premium, and the rise in interest rates. At least the last factor is unlikely to be relevant, though, since rates have risen in the euro area no less than in the United States. As such, poor fundamentals (low efficiency, limited future growth opportunities) more likely weigh on market valuations.

The small median size of euro area banks, especially in some countries, plays a role too. Banks below a €30 billion asset size threshold continue to be supervised by national authorities (the SSM contributes only as 'indirect' supervisor). Some of these supervisors may be more lenient than the SSM is. Furthermore, with a less than fully reliable resolution framework for these banks, market discipline is not effective. Consistent with this, share valuations have not been very sensitive to the recent increase in profitability as investors may believe the higher returns to be not sustainable over time, even as persistent regulatory weaknesses will continue to allow banks to operate. Altogether, the risk of a significant and growing share of zombie banks in the European Union cannot be excluded.

# Discussions

## INTRODUCTION, REVIEW OF RECENT EVENTS, WEAKNESSES IN EUROPE (CHAPTERS 1, 2 AND 3, PART 1)

**Chaired by Marlene Amstad, FINMA**

**Petra Tschudin**, *Swiss National Bank (focus on the European part of Chapter 3)*
Good morning. Thank you for inviting me. It was a pleasure to read the report, and it is a pleasure to be here.

Let me start by saying that this is a very insightful report. What I particularly appreciate is the analysis of commonalities and differences between crises. When examining the common features, we observe weak risk management and poor governance structures that failed to handle risks effectively in both the US and Credit Suisse cases. Another shared characteristic was the rapid flight of deposits.

The differences stem from the immediate causes of the crises. In the United States, rising interest rates and unrealised valuation losses due to materialised interest rate risk were pivotal. In Switzerland, the primary factors were business risk and a general loss of confidence in Credit Suisse. It is also worth noting that no crisis occurred in the rest of Europe.

I would like to address two points: first, the methods for monitoring risk; and second, the relationship between central bank monetary policy and banks' risk-taking behaviour. Starting with risk monitoring, there is no silver bullet. We have regulatory metrics and market indicators. Both have strengths and weaknesses. Regulatory metrics are useful measures of risk in most circumstances. But in certain cases, they can appear sound during stable periods, only to move sharply during crises. The much higher than anticipated speed of outflows in both the US and Credit Suisse cases is a case in point. Stress tests attempt to evaluate the robustness of regulatory metrics under various economic conditions. But they are not perfect measures of risk, either, because it is difficult to simulate the next crisis.

Market indicators can capture risks that regulatory ratios and stress tests might miss. For example, European banks currently appear weaker compared to US banks when market indicators are considered, potentially due to sovereign debt risk and the risk weights of government bonds. However, market indicators are susceptible to reacting to rumours and can be manipulated, so they are not a perfect instrument to monitor risk either.

We need to adopt a broad perspective, considering all available indicators of risk, and ideally acting early when identifying potential financial stability issues. This approach is challenging because pre-emptive actions can face criticism if the anticipated crisis subsequently does not materialise.

Turning to the link between monetary policy and banks' risk-taking, the primary connection is the maturity mismatch. Policy rates fluctuate, but longer-term rates might not follow in tandem. The report's discussion on the impact of quantitative easing (QE) on banks' risk-taking is very useful. However, the report could have better clarified the different channels through which this operates. Table 1 summarises the channels through which QE affects banks' risk taking.



TABLE 1 **MONETARY POLICY AND BANKS' RISK-TAKING: THE IMPACT OF QUANTITATIV E EASING**

| | HQLA | Maturity mismatch | Balance sheet size |
|---|---|---|---|
| QE with banks as counterpart | (↑) | ↓ (reserves in exchange for other assets) | |
| QE with non-banks as counterparts | ↑ | ↑ (customer deposits)<br>↓ (more reserves) | ↑ (customer deposits and reserves increase) |
| QE coincides with interest rate cuts | | ↑ (customers shift from time to demand deposits)<br>↑ (asset values rise) | ↑ (asset values and equity rise) |

If a central bank conducts QE with commercial banks as counterparts, the banks sell assets to the central bank and receive reserves, reducing their maturity mismatch, as reserves have an overnight maturity. QE can also increase the High-Quality Liquid Assets (HQLA) and hence the bank's Liquidity Coverage Ratio (LCR), depending on the assets sold.

If the counterpart of the central bank is not a bank but the bank's customer, then there is an impact on both the maturity mismatch and on the balance sheet size of the commercial bank. QE leads in this case to both an increase in deposits and in reserves, which expands the bank's balance sheet and affects the leverage ratio. At the same time, the maturity mismatch can move up or down because there are additional items on both the asset and liability side entering with short maturity. The additional reserves also result in an increase in banks' HQLA.

The report also thoroughly discusses the shift from time deposits to demand deposits. It is important to note that this shift is not only determined by banks' decisions but also by their customers' decisions. Central banks adopt QE at times when they have already significantly lowered interest rates. There is therefore a money demand response by banks' customers. The opportunity cost of holding money decreases, prompting customers to switch from time to demand deposits, thereby increasing the maturity mismatch. This shift thus occurs without any action taken by the commercial bank. Simultaneously, the value of assets rises due to low interest rates, further expanding the size of long-maturity assets on the balance sheet through valuation effects.

Banks and supervisors must be prepared for rising interest rates. Ideally, in the first-best world, well-prepared banks would not face significant issues when central banks need to raise interest rates and policymakers would not need to worry about financial stability. However, if preparedness is lacking, the report suggests that central banks might need to increase rates gradually, which is what I consider a third-best option. The second-best option is that the central bank tightens policy to achieve price stability and offers lender-of-last-resort liquidity against collateral if banks are ill prepared for the higher interest rates. However, it is important to note that lender-of-last resort liquidity cannot address fundamental insolvencies that arise due to the materialisation of interest rate risks. The granting of solvency support and thus the decision whether to support a bank with public funds and at taxpayers' risk must be taken by the government and parliament.

**Daniel Kalt**, *UBS (focus on the European part of Chapter 3)*
Thank you for inviting me to this session. I agree with the report that the regulatory and supervisory framework for the banking sector should be adaptive and constantly adjusted. Learning from crises is crucial, and the report is an important contribution towards that goal.

Regarding last year's events, it is important to note that it was primarily a US crisis, not a European one, except for what we saw in Switzerland. Europe's early implementation of the Basel III framework and a consistent supervisory framework has provided more stability to the system. However, this stability came at a cost. European banks have lost substantial market share in investment banking over the last decade, recorded lower profitability, and posted lower price-to-book ratios. Despite these costs, having a more stable system was likely worth it.

The unfinished banking union in Europe has also contributed to these phenomena. In Europe, we have less consolidation, fewer economies of scale, and a shallower financial securitisation market compared to the United States. For instance, US banks have been able to offload low-margin loans from their balance sheets, which has not been the case in Europe. Regarding Credit Suisse, I largely agree with the report's assessment.

Finally, on the transmission of QE and QT on funding risks vulnerabilities, I agree with Petra Tschudin that banks have limited control over their funding structure. The shift from time deposits to demand deposits results from a complex interaction influenced by how banks price their deposits and the term structure of the yield curve. Banks do not fully control this structure because thousands of depositors make decisions based on monetary policy and central bank actions.

### Floor discussion (Chapters 1, 2 and 3, part 1)

**Jeronimo Zettelmeyer** (Bruegel) asked if the authors considered the impact of interest rate rises on doom loop mechanisms and if they explored whether differential responses of bank spreads exist depending on the sovereign nexus level in each country. Regarding liquidity dependency, he asked whether the report recommends managing down balanced sheets or if it should be addressed through supervision. Finally, he asked whether the high capitalisation of European banks could explain the low profitability.

**Anthony Smouha** (Atlanticomnium SA) questioned why unlimited central bank support was not provided to Credit Suisse, expressing a personal view that there would have been zero risk from offering a larger guarantee.

**Stefan Gerlach** (EFG Bank) noted that the recent tightening of monetary policy had been unprecedented in terms of the number of central banks raising interest rates, and the sheer size and speed of the increases. The fact that three small and very poorly managed banks in the United States collapsed was not a bad thing and did not warrant a redirection of monetary policy towards financial stability.

**Katrin Assenmacher** (European Central Bank) concurred with Petra Tschudin that the report should look at the impact of asset purchases on the distribution of reserves and the subsequent actions of banks' customers, which can lead to balance sheets maturity mismatches at the individual level. She also noted a significant increase in non-financial corporation deposits in the euro area due to carry trade practices (banks attract uninsured deposits at very low interest rates and place them as reserves on central banks' balance sheets). She found it puzzling that issues with uninsured deposits were more prevalent in US banks given the more limited carry-trade opportunities.

**Stijn Claessens** (Yale School of Management) responded to the question on capital and profitability, stating that well-capitalised and well-run banks can be very profitable. He acknowledged that rapid capital increases might reduce short-term profitability but emphasised that the two can coexist well in the long run. He argued that the profitability issue in Europe is related more to the banking structure, with too many banks. He also discussed the link between monetary policy and financial stability, suggesting that policymakers should integrate possible financial stability concerns during periods of QE and QT but not necessarily to the extent of adjusting the monetary policy stance. He also pointed out that monetary policy could inadvertently increase risks to the banking system. Given the presence of multiple banks with vulnerable profiles in the United States, he acknowledged that there was a need to intervene to prevent a systemic collapse, despite the moral hazard concerns. He also concluded by suggesting that adjusting monetary policy on a day-to-day basis is not practical.

**Sascha Steffen** (Frankfurt School of Finance and Management) indicated that a detailed analysis of the dynamics of banks' funding structure in Europe was not possible due to a lack of data. However, he noted that in the United States, banks did actively manage deposit spreads. On the doom loop, he acknowledged the need for further econometric analysis but pointed out descriptive evidence of risk-taking behaviours, such as an increase in the share of sovereign debt holdings with longer maturity, a sell-off in German sovereign bonds, and the purchase of Italian and Spanish sovereign bonds, consistent with carry-trade activities. He also mentioned the complexities in analysing spread developments due to the ECB's large asset-purchase programmes. On liquidity dependence, he noted that there is a knowledge gap regarding the optimal size of central banks' balance sheets. He also noted that policymakers should consider how money should be deployed in future QE rounds by considering possible limits on central banks' liquidity dependence and higher quality collateral. He also disagreed with the notion that there are no macroeconomic costs associated with liquidity dependence. He pointed to the dash-for-cash episode in 2020 in the Unites States, marked by a liquidity drain in the system, reducing the supply of credits, which has important consequences at the macroeconomic level.

**Petra Tschudin** suggested estimating money demand equations to understand shifts from time to demand deposits. She also emphasised the importance of preparing collateral for central bank liquidity support, noting that taking on risks by providing unlimited and/or unsecured financial support is a fiscal decision that should be taken by government and parliament.

**Daniel Kalt** highlighted the role of held-to-maturity securities classifications on banks' equity positions and noted the importance of monitoring such risks in Europe.

## LONG-TERM WEAKNESSES IN THE UNITED STATES (CHAPTER 3, PART 2) AND RESOLUTION (CHAPTER 4, PART 3)

### Chaired by Jean-Pierre Roth, former Swiss National Bank

**Charles Goodhart**, *London School of Economics (focus on the US part of Chapter 3)*
It is a pleasure to be here. Approximately three weeks ago, I attended the 50th anniversary of the Basel Committee on Banking Supervision. The committee's name seems somewhat misleading, as it has focused extensively on regulation rather than supervision, except for occasionally issuing and revising the core principles.

In the United States, the failures in March 2023 highlight the partial role of regulatory shortcomings. Regulators had reduced equity requirements for medium-sized banks, but more notably, supervisors failed to act promptly or decisively despite being aware of issues. Supervision is particularly challenging for economists due to the lack of data, which complicates issue resolution. I commend the report's Section 4.2 on the CAMELS ratings, which I found excellent. However, the supervisory side requires significantly more effort.

My preferred Latin phrase is "*quis custodiet ipsos custodes*", which translates to "who guards the guardians?" Who oversees the supervisors? Where is the quality control in supervision? I propose the release of supervisory reports on individual banks after a suitable period, perhaps five to ten years. This would facilitate the verification that supervisors identify risks, recommend improvements, and confirm the implementation of those improvements. The prospect of historical scrutiny would promote better practices.



One of the significant advancements in supervision in the United States following the Lehman Brothers collapse was the introduction of stress tests. However, the section on the United States in the report lacks discussions of stress tests. I am surprised that I cannot recall a stress test involving higher interest rates. If such tests were not conducted, what was the reason? Before criticising bankers and supervisors, it is important to remember that until around 2022, mainstream economists believed interest rates would remain low for an extended period and that inflation increases were temporary. Under this belief, lengthening the maturity of debt was sensible.

In Section 3.2, the report attempts to mark to market not only securities but also everything else including loans. This approach has advantages, especially for commercial real estate. However, alongside considering the downsides, it is crucial to recognise the upsides. When interest rates rise, the net interest margin and profitability often increase, serving as a counterbalance. Focusing exclusively on potential credit and interest rate losses is one-sided.

The call from nearly every economist in this field is for increased equity, but it is unlikely to happen. The banking community strongly resists this, as evidenced by the lobbying against the Basel III implementation in the United States. We need to consider alternatives to merely demanding more equity, as this approach is likely to fail.

I would like to conclude by highlighting a footnote at the end of Section 3.2, which reads: " We already saw some evidence of banks 'gambling for resurrection' with respect to their hedging activity: banks increase their current earnings by selling profitable hedges while exposing themselves to even larger interest rate risk. If the interest rate declines and the bank survives, the shareholders benefit from this strategy. However, the FDIC, and ultimately the taxpayers, will have to bear the cost if the bank fails." Limited liability creates a significant moral hazard, with bankers benefiting from the upside through bonuses without facing the downside.

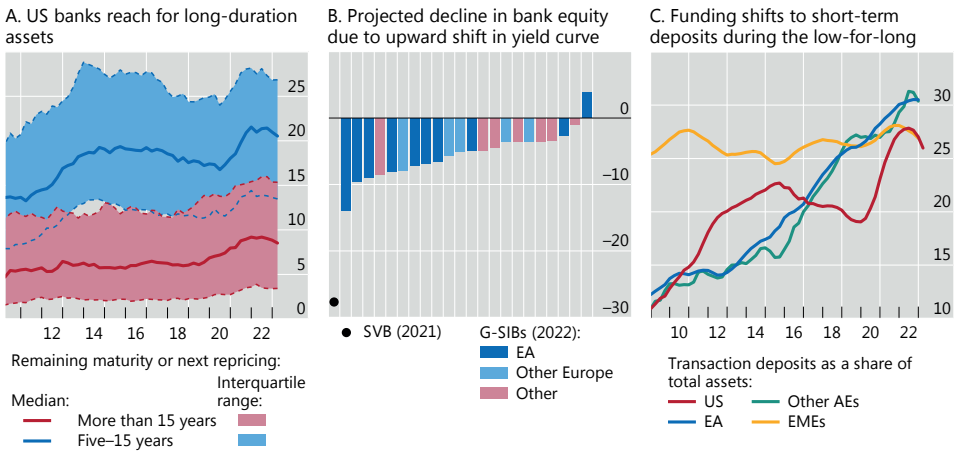
An alternative to demanding more equity is to remove limited liability for leading banks and institute multiple or even unlimited liability for CEOs and senior bank executives. This approach might be easier to implement, as no bank executive believes they will lead their bank into a default crisis.

**Deniz Igan**, *Bank for International Settlements (focus on the US part of Chapter 3)*
Thank you very much. After listening to Charles Goodhart, I believe that my arguments may complement his, supported by some illustrations.

On the main findings of the report, there is broad consensus. The combination of uninsured deposits and mark-to-market losses caused the collapse of Silicon Valley Bank (SVB) and two other banks. The primary shock was the increase in interest rates. While agreeing on these points, I will focus on two questions: How widespread and significant is the problem? Is SVB an outlier? Additionally, what other factors failed, particularly in terms of supervision and regulation?

In the latest BIS Annual Economic Report, we analysed what went wrong and noted that US banks reached for long-duration assets while shifting their funding structure towards short-term deposits, thereby increasing the risk of outflows (see the left and right panels of Figure 1).

**FIGURE 1 THE LONG SHADOW OF LOW-FOR-LONG**

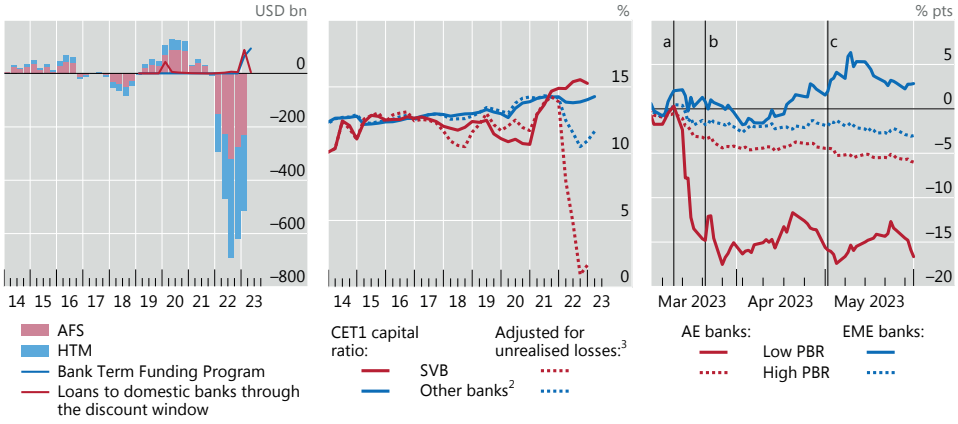



Source: BIS (2023).

The middle panel of Figure 1 presents stress tests conducted to assess the impact of an upward shift in the yield curve on bank equity. Although SVB was not included in the official stress tests, applying similar scenarios reveals that SVB was an outlier, significantly more vulnerable than other banks. The left panel of Figure 2 illustrates the substantial mark-to-market losses for available-for-sale and hold-to-maturity securities, as well as the intervention through the Bank Term Funding Program (BTFP). While the magnitude of the BTFP appears minor, other measures extended beyond this including deposit insurances. The middle panel of Figure 2 highlights that the recognition of unrealised losses affecting capital ratios was considerably worse for SVB compared to other banks.

The right panel of Figure 2 also shows that equity investors differentiated among banks based on their price-to-book ratios following the news of SVB's failure. Advanced economy banks with low ratios suffered more, while emerging market banks with healthy ratios interestingly experienced less impact.

FIGURE 2 **RISING INTEREST RATES TEST RESILIENCE**




Source: BIS (2023).

Table 3 ranks US banks by the share of uninsured deposits and the ratio of loans and hold-to-maturity securities to total deposits. SVB ranked second, Signature Bank fourth, and First Republic tenth – each of which faced significant difficulties. The combination of these vulnerabilities was crucial. For instance, Bank of New York Mellon did not encounter issues because it lacked the vulnerability associated with a high share of loans and hold-to-maturity securities.

TABLE 3 **TOP TEN US BANKS BY PROPORTION OF UNINSURED DEPOSITS AT END-2022**

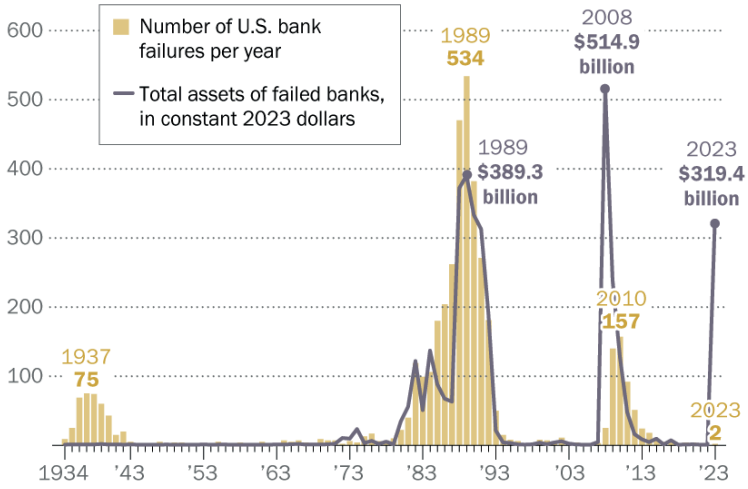
| Bank | A. Uninsured deposits as share of total deposits (%) | B. Loans + HTM securities as share of total deposits (%) | Ratio A/B |
|---|---|---|---|
| Bank of New York Mellon | 96.5 | 31.2 | 3.1 |
| Silicon Valley Bank | 93.9 | 94.4 | 0.99 |
| State Street Bank & Trust Co | 91.2 | 40.1 | 2.3 |
| Signature Bank | 89.7 | 93.3 | 0.96 |
| Northern Trust Co | 83.1 | 54.5 | 1.5 |
| Citibank | 77.0 | 64.6 | 1.2 |
| CIBC Bank USA | 73.2 | 87.1 | 0.84 |
| HSBC Bank USA NA | 72.5 | 47.4 | 1.5 |
| City National Bank | 70.4 | 93.6 | 0.75 |
| First Republic Bank | 67.7 | 110.6 | 0.61 |

Source: S&P Global

Interestingly two other banks, CIBC Bank USA and City National Bank – both owned by Canadian institutions – had low ratios of uninsured deposits to mark-to-market losses. This observation may warrant further investigation.

The actions of supervisors also warrant scrutiny. As illustrated in Figure 3, the year 2023 was notable not for the number of bank failures but for the size of the banks affected. This raises the question of whether these events were merely due to bad luck or indicative of deeper issues, especially since interest rate risk is a fundamental banking risk.

FIGURE 3 **A HISTORICAL OVERVIEW OF US BANK FAILURES**




Note: As of 11 April 2023. "Failures" includes federal assistance transactions. "Banks" includes savings-and-loans and other similar deposit-taking institutions.

Source: Pew Research Center analysis of data from Federal Deposit Insurance Corp.

Some of the analysis in the report deserves scrutiny in assessing the extent to which what happened in the spring of 2023 was systemic and a repeat may be likely. The report claims that resolving all endangered banks' assets would involve $2 trillion but it assumes a 100% run on uninsured deposits. However, we should consider a more realistic scenario as the baseline as outlined in Table 4.1 of the report, such as the 42% run experienced by SVB.

Another dimension to consider is the concentration of uninsured deposits. While the report discusses geographical distribution, it could examine more thoroughly the concentration of uninsured deposits. The commercial real estate (CRE) exposure combining interest rate and credit risks is another intriguing point. Clearer key takeaways on this overlap would be beneficial. The report would also benefit from systematically comparing the current situation to the 1980s Savings and Loan Crisis.

Lastly, regulatory capture is a concern. The stress test thresholds and regulatory requirements for US banks were relaxed in 2018-2019, heavily lobbied by mid-sized banks. The evidence of regulatory leniency and differentiation for the same bank is troubling and deserves more discussion. Understanding the relationship between regulators, supervisors, and banks is crucial for avoiding suboptimal outcomes. Addressing these cultural and governance issues might facilitate the completion of Basel III and prevent the easy reclassification of assets.





**Eva Hupkes**, *International Association of Deposit Insurers (focus on recovery and resolution)*

I am delighted to be here. I think the report and its recommendations are excellent, and I endorse them fully. I have identified three issues that I feel have not been addressed or could be explored more in the report. These relate to the post-global financial crisis reforms and why some have not been fully implemented, the tension between recovery and resolution, and the underlying governance and institutional arrangements required to implement the recommended actions.

First, all the recommendations in the report align with those made after the global financial crisis and issues identified at that time. The issue is less about analysis and understanding, and more about action – or rather, inaction. Consider the key attributes of 2011 and the Basel Committee's recommendations that preceded them. These recommendations called for a broad range of resolution actions, including bridge banks and bail-ins. I am very grateful to Stijn Claessens, who showed the Financial Stability Board (FSB) traffic light table, which indicated a lot of green, some yellow, and some red. However, because it relies on self-assessment, I question if all authorities have the capability to operationalise these tools.

In 2013, the FSB issued guidance on recovery triggers and stress scenarios, calling for a combination of qualitative, quantitative, automatic, and discretionary triggers, and emphasising that these triggers should not link to lagging metrics. In 2016, the FSB issued principles on resolution funding, calling for an explicit liquidity backstop and recommendations addressing the liquidity and the fungibility of liquidity resources in times of stress. More recently, there was work on unallocated Total Loss Absorption Capacity (TLAC) resources to ensure loss-absorbing capacity is not pre-positioned.

The 2018 bail-in execution principles addressed legal complexities that remained unresolved. The key attributes required top officials to review plans annually. For example, the chairman of the Swiss National Bank would have been required to annually sign off on Credit Suisse's resolution strategy. One post-global financial crisis proposal not implemented at all was the 2010 G20-endorsed FSB framework on reducing the moral hazard risk of systematically important financial institutions (SIFIs). This framework called for home jurisdictions of global SIFIs to subject their policy measures for globally systemically important financial institutions (G-SIFIs) to peer review by a council. However, this peer review council, comprising senior members of authorities overseeing

G-SIFIs, was never established. The authorities implemented an annual resolvability assessment process that is no longer really annual and regular reporting of Good Practices for Crisis Management Groups (CMGs) to the FSB on resolvability. However, this reporting quickly shifted to a technocratic level, excluding very senior officials. Possible reasons for the inaction include unwillingness, loss of momentum, and erosion of political will. The question now is whether the recommended actions will be fully implemented.

My second point concerns recovery plans. While recovery plans should receive more attention, is it feasible to optimise recovery and resolvability simultaneously? There are tensions, such as in liquidity management. Resolution planning requires banks to maintain pools of liquidity in various subsidiaries and jurisdictions such as the US Resolution Liquidity Execution Need (RLEN). However, during periods of stress, such a mechanism might trap liquidity in some subsidiaries, while the bank might need to deploy liquidity to the parts experiencing the most stress, potentially impeding recovery. An academic proposal by Cumming and Eisenbeis (2010) suggests a single financial charter to address this issue by having a systemically important bank operate as a single entity across jurisdictions.

Another issue is whether AT1 bonds can practically serve as a going-concern source to reinforce the capital positions during recovery. Ensuring timely conversion to support recovery involves tricky issues, such as automatic versus supervisory discretion and negative signalling.

Third, regarding governance and institutional arrangements, the report recommends various recovery and resolution measures but remains silent on who should be responsible for adopting them. In Switzerland, the prominence of UBS obscures the line between micro- and macroprudential oversight. Swiss citizens have an interest in ensuring that authorities consider their concerns when resolving G-SIBs in Switzerland. Various actors in the financial stability framework have distinct mandates, but these need to work seamlessly in a crisis. Without codified arrangements or rule-based systems, authorities might focus only on their roles and responsibilities.

### Floor discussion (Chapter 3, part 2 and Chapter 4, part 3)

**Amit Seru** (Stanford Graduate School of Business) highlighted the complexity of managing interest rate risks in a world with multiple equilibria, explaining that depositor behaviour and bank profitability can vary significantly based on the prevailing equilibrium. He discussed the potential for minor losses in banks if depositors do not react to rising interest rates, but also highlighted the alternative possibility of large losses in the case of self-fulfilling prophecies if a small proportion of depositors start withdrawing their funds. He noted that government backstops complicate the analysis of assessing whether a multiple equilibria situation would have emerged had the government not intervened.

He also pointed out that the issue of uninsured depositors at banks like Silicon Valley Bank could lead to significant financial risks. He concluded by emphasising the need for better information sharing and the challenges of ensuring regulatory action in a timely manner.



**Beatrice Weder di Mauro** (Geneva Graduate Institute, INSEAD and CEPR) emphasised the importance of acting on warnings from institutions like the FSB and questioned whether we are effectively applying current lessons from situations like Credit Suisse. She pointed out the challenges in cross-border banking resolutions and the necessity for greater cooperation and trust between home and host authorities to ensure adequate liquidity and capital within different jurisdictions.

**Dirk Niepelt** (University of Bern) questioned whether the ownership of convertible bonds, especially by US investors, should be treated differently. For instance, he inquired whether convertible bonds issued under US law and held by US investors should be classified as TLAC. He also queried whether regulatory incentives targeted at shareholders effectively influence bank management.

**Yves Bonzon** (Bank Julius Baer & Co. AG) highlighted the impact of rapid balance sheet growth on the losses at SVB, using it as a cautionary example against overly rapid expansion in both regulated and shadow banking systems. He also endorsed the concept of clawbacks and advocated for more symmetrical payout structures for bank executives, although he expressed scepticism regarding unlimited liability.

**Cédric Tille** (Geneva Graduate Institute) questioned how to ensure the actual implementation of plans for improving banking resolution when needed, citing the Credit Suisse case as an example where the will to act was lacking. He pointed out that politicians hold ultimate decision-making power, complicating efforts to hardwire a commitment to act during crises.

**Agnès Bénassy-Quéré** (Banque de France) discussed how the European Union has tackled the issue of unrealised losses in relation to interest rate variations through Pillar 2 the Basel III framework. She mentioned the use of outlier tests and supervisory dialogue to manage these risks, and questioned whether this approach might be a viable alternative to more equity or marking all assets to market.

**Amit Seru** agreed that the rapid growth of uninsured deposits post-COVID in the United States is a potential issue, noting that asset-side exposures have also increased. On Pillar 2 of Basel III, he pointed out that in the United States, post-global financial crisis accounting was not adequately tied to the liability side. He discussed the appropriateness of classifying certain assets, such as Treasury bonds, as hold-to-maturity, given the potential liquidity risks associated with runnable deposits.

**Beatrice Weder di Mauro** stressed the importance of achieving legal certainty in bail-in processes and coordination through the FSB. She argued for early intervention triggers and the necessity of political preparedness to handle resolutions effectively. She emphasised the need for technical, rather than political, decision-making in the resolution process, advocating for clear legal frameworks and early intervention to mitigate risks.

**Charles Goodhart** (London School of Economics) argued that current stress tests, involving interest rate changes of merely 200 basis points, are insufficient. He warned that increased volatility in interest rates is likely as monetary policy confronts higher debt ratios, significantly complicating debt management. He argued that recent gradual increases in interest rates would not be sustainable in the future, as they will coincide with challenges in financing deficits. He emphasised the necessity of rapidly adjusting both thinking and strategies to address these forthcoming challenges.

**Eva Hupkes** reiterated her inquiry regarding the full implementation of current recommendations and necessary actions to ensure better preparedness for the next crisis. She advocated for a rules-based, predictable framework for decision-making in the recovery and resolution of G-SIBs, emphasising the importance of executive involvement and international cooperation due to the global nature of banks.

## REVIEW OF WHAT IS AMISS (CHAPTER 4)

### Chaired by Martin Schlegel, Swiss National Bank

**Jean Pierre Landau**, *Sciences Po (focus on banking integration in Europe and financial stability and monetary policy coordination)*
Thank you very much. I will comment on the relationship between financial stability and monetary policy with respect to banking factors, and I am pleased to do so for three reasons. First, the monetary drivers of the recent crises are extremely important, and we should intervene. Second, these monetary drivers are often overlooked, so we should pay attention to monetary aggregates. Third, the report provides very interesting insights that I support, and I am pleased to contribute further to the discussion.

The report discusses the succession of monetary expansions through quantitative easing and contractions through quantitative tightening that left banks with fragile funding structures. Conducting QE involves either buying bonds from banks, which increases reserves, or buying bonds from non-banks, which increases both reserves and broad aggregates. Conducting QT then leads banks to experience a funding shortage because they have used that funding to grant credit or buy bonds. This should have triggered more supervisory reaction, either by monitoring interest rate risks or the credit activity of banks. It is the role of macroprudential policy to ensure that monetary policy does not lead to excessive credit expansion and amplify credit cycles.

I think the diagnosis in the report about the relationship between monetary policy and financial supervision is correct. The M2 monetary aggregate to GDP ratio in the United States has significantly increased since 2010, coinciding with the implementation of QE. This trend raises many questions and can be extremely informative.

I will focus on two questions. Were the recent events a pure banking issue, or were they a manifestation of something broader (NBFIs, the 'dash for cash', the liability-driven crisis)? Was it a solvency, risk, or liquidity event, or was it a pure liquidity shock? I would like to elaborate more on the liquidity view. Imagine taking a long sabbatical on a deserted island from 2018 to 2023. Upon returning, you would notice the 2019 repo crisis in the United States, the 2020 'dash for cash, the 2022 liability-driven crisis in the United Kingdom, and the 2023 SVB collapse. Each event saw massive central bank interventions, suggesting something deeper than just a banking phenomenon and indicating a new era of central bank intervention. I believe there are some questions to consider.

First, has the financial system, including both banks and non-banks, become more liquidity dependent? My answer is probably yes, given the events we have seen. Second, is this liquidity dependence a consequence of central bank actions or exogenous factors? I believe it is both, with exogenous factors playing a significant role. A liquidity preference is emerging in the system. Third, why would sophisticated treasurers hold large uninsured deposits instead of Treasury bonds with the same yield? This abnormal monetary demand requires explanations.

The absence of opportunity cost in 2020 does not entirely account for the rigidity of uninsured deposits. It is irrational for sophisticated treasurers to prefer an asset with no additional benefits when they could obtain the same yield from a safer asset. This scenario is reminiscent of the dash-for-cash episode, where investors showed a preference between holding Treasuries and reserves, recognizing that these are not perfect substitutes. In this case, the pseudo-liquidity provided by uninsured deposits was valued more highly than holding short-term Treasuries, despite minimal switching costs between the two. Without a full understanding of the events, it is difficult to make a definitive diagnosis regarding banking stability and its relationship with central bank behaviour.

However, I would identify two structural factors that may explain why the system is becoming more dependent on liquidity. The first is technology, which reduces switching costs and makes different forms of money more substitutable. This technological shift makes runs easier, faster, and less costly. The era of deposit instability has begun and will likely continue, as technology enables the rapid transfer of large sums overnight. Everyone can now easily arbitrage between different forms of money based on perceived risks. Without public money as a backup, we will face significant volatility in the system. This is a pure monetary factor. The second structural factor is the shift of maturity transformation from banks to non-banks, which makes the system more vulnerable to liquidity shocks. When banks engage in maturity transformation, it occurs within their

balance sheets. In contrast, maturity transformation for non-banks involves a sequence of interlocked balance sheets, each connected to different markets. This interconnectedness makes the entire system highly vulnerable to liquidity shocks in any of those markets, thereby increasing overall liquidity dependence.

This concept is not new and the FSB report thoroughly covers it. However, addressing the policy implications is crucial. Central banks need to maintain elastic balance sheets. The specific size of the balance sheets is a secondary concern. What matters is their ability to step in and provide liquidity when needed. Given that both banks and non-banks have become more liquidity-dependent, this capacity is crucial.

I recommend that the authors emphasise robust measures regarding deposit insurance and the lender of last resort mechanism. Specifically, I advocate aligning the legal framework for deposit insurance with current practices to ensure all deposits are insured. This alignment is vital for maintaining financial stability. Thank you very much.

### Floor discussion (all chapters)

**Ignazio Angeloni** (SAFE and IEP Bocconi) addressed three questions raised by Jean Pierre Landau. He discussed whether macroprudential instruments could effectively deal with the recent banking events. He suggested that the current macroprudential framework was inadequate for addressing such issues due to its structural limitations. Macroprudential instruments include structural buffers, which do not vary with the economic cycle, along with a countercyclical component tied to the real economic cycle. In the current context, the sudden monetary policy shock, which has not yet affected the cycle, cannot be effectively managed by rapidly increasing bank capital. Therefore, he concluded that no suitable macroprudential instrument existed for addressing this issue. On the need for increased central bank liquidity, Angeloni argued that there was no necessity. He emphasised the necessity of heightened central bank vigilance due to multiple risks. He believed that the financial system did not inherently require additional central bank liquidity. He noted that quantitative tightening was proceeding smoothly without causing issues in liquidity or treasury markets, and advocated a wait-and-see approach. Addressing why many uninsured depositors did not purchase treasuries or other assets, he explained that, around late 2019 and early 2020, bank deposits were perceived as having zero risk, zero opportunity cost, and zero transaction cost, particularly with the advent of online banking. This led many to keep their money in deposits until the situation changed, which caught some off guard by unexpected developments.

**Martin Schlegel** (Swiss National Bank) commented that he perceived an exaggeration in blaming monetary policy for last year's turmoil. He acknowledged the negative effects but emphasised that the first-order effect of monetary policy was positive for financial stability.

**Stijn Claessens** (Yale School of Management) reflected on his past work on QE and its side-effects, noting that previous reports had not adequately addressed the liability side of the banking system. He acknowledged that recent findings highlight the importance of this risk and warrant further analysis. He emphasised that although the financial system has so far avoided major problems, it still needs to internalise fiscal moral hazards and other costs.

**Amit Seru** (Stanford Graduate School of Business) agreed that monetary policy helped stabilise the banking system in the short run but cautioned against early celebrations. He pointed out that the real costs, whether first or second order, would become apparent over time, similar to the Savings and Loans Crisis.

**Petra Tschudin** (SNB) discussed the importance of looking at monetary aggregates, noting that fiscal policy played a significant role in the surge of monetary aggregates, especially in the United Stated. She highlighted the large fiscal support measures that contributed to the increase in deposits and emphasised that both monetary and fiscal policies were important in understanding banks' risk-taking dynamics.

**Claudio Borio** (Bank for International Settlements) added that if the central bank had implemented a scarce reserve system with targeted government balances, the redistribution of deposits within the banking system would not have increased overall M1 monetary aggregates.

**Luigi Federico Signorini** (Banca d'Italia) noted that maturity transformation is a normal banking activity. However, he suggested that prudential rules should limit excessive maturity transformation and proposed implementing backstop rules to prevent banks from having unbalanced maturity structures.

**Stijn Claessens** cautioned against advocating for too many new rules, emphasising the importance of applying existing rules effectively. He preferred more discretion and accountability for supervisors rather than adding more regulatory measures.

**Amit Seru** (Stanford Graduate School of Business) discussed the implications of unconventional monetary policy, emphasising the provision of forbearance to households and small and medium-sized enterprises without adequately testing the financial sector's stability. He warned that monetary policy actions could have long-term, possibly detrimental effects, especially if high interest rates persist due to inflation. He suggested that this situation could constrain monetary policy, which should prioritise price levels rather than financial stability. He also examined issues related to maturity transformation, specifically the practice of moving securities from available-for-sale to hold-to-maturity to avoid marking them to market, which could be problematic if deposits are highly runnable. He compared practices in the United States with those in the United Kingdom, where such securities must be marked to market, thereby improving the alignment of asset-liability ratios. Finally, he highlighted the challenges of achieving equilibrium in

monetary policy and bank stability, cautioning against assuming depositors will remain passive as interest rates rise, which could lead to potential bank runs. He acknowledged that banks might need to over-hedge or under-hedge, noting that perfect hedging is unrealistic and some level of imperfection may be necessary.

**Agnès Bénassy-Quéré** (Banque de France) asked about ways to improve US banking supervision to avoid sluggishness.

**Amit Seru** highlighted the challenges of accessing banking data due to supervisors' reluctance to share it. This reluctance stems partly from concerns about the persistence of bank ratings and the potential for back engineering, especially with AI. He emphasised that management quality accounts for 50% of the variation in CAMELS ratings (Capital adequacy, Asset quality, Management quality, Earnings quality, Liquidity, and Sensitivity to risks). While strong management is crucial for bank performance, institutional incentives and forbearance can undermine its effectiveness. He recommended a regulatory reform similar to the supranational regulation attempted in Europe. He proposed that beyond local regulators' assessments, a more stringent, independent regulator should intervene when ratings signal significant issues. This would prevent local regulators from allowing problematic banks to continue operating unchecked. He recommended including this suggestion in the report.

**Marlene Amstad** (FINMA) discussed the challenges of providing real-time transparency in supervision due to legal constraints, particularly in Switzerland, where FINMA cannot publicly disclose all enforcement actions. She highlighted issues in compensation practices using Credit Suisse as an example. Despite a 3 billion loss over the past 12 years, bonuses totalled 33 billion, indicating significant room for improvement. She also emphasized the importance of strengthening market forces. She argued that supervision should not replace the roles of management, the board, or bank owners, who should act as the first line of defence.

**Stijn Claessens** emphasised the limitations of empirical work in regulatory reports, noting that the available data often constrain the findings.

**Beatrice Weder di Mauro** discussed the need for real-time transparency and ex-post accountability in supervisory actions, using the FINMA report as an example. She argued that early and rules-based intervention mechanisms would provide legal protection for supervisors and deter poor management practices. She stressed the importance of making these processes formal and transparent to improve supervisory effectiveness and cooperation from management.

**Ignazio Angeloni** highlighted the euro area's disclosure rules, which require public disclosure of supervisory or resolution documents upon request, albeit with possible reductions. He suggested that Switzerland could benefit from introducing similar rules to enhance transparency.

**Marlene Amstad** replied that Switzerland does not have a similar provision, which mandates public disclosure of supervisory documents.

**Katrin Assenmacher** (European Central Bank) emphasised the need to link developments in monetary aggregates with deposit activities to understand financial stability risks. She criticised the reliance on forward guidance by central banks, which delayed interest rate hikes and potentially contributed to long-term financial stability issues. She called for a deeper analysis of the impact of forward guidance on financial stability.



**Ignazio Angeloni** highlighted the need for research into how monetary aggregates affects financial stability versus price stability. He noted that financial stability impacts can arise immediately, while price stability effects take longer to manifest.

**Harris Dellas** (KBI) questioned whether the failures of banks like Credit Suisse and Silicon Valley Bank would have occurred without government intervention and regulation, suggesting a counterfactual analysis of the impact of regulation on these failures.

**Beatrice Weder di Mauro** responded by noting that without banking regulation, the structure and activities of banks would be very different.

**Stijn Claessens** added that non-banks, which are often unregulated, could serve as a model for a less regulated banking system. However, he argued that such a system is undesirable and predicted that the next financial crisis might involve non-banks due to their lack of regulation.

**Jean Pierre Landau** emphasised the importance of considering both the supply and demand for money in economic analysis. He questioned whether the public's increased need to hold money for the same activities is a structural change affecting financial stability.

**Stijn Claessens** observed that during the COVID-19 pandemic, the massive expansion of money supply matched by demand did not lead to inflation due to the potential for economic depression. He suggested that during this period, policymakers temporarily overlooked financial stability concerns.

**Beatrice Weder di Mauro** emphasised that the COVID-19 pandemic represented a completely different regime in terms of monetary injection. She noted that in April 2020 there was a fear of a financial implosion, leading to unprecedented monetary measures by central banks.

**Jean Pierre Landau** highlighted the significant decrease in the velocity of money over the past decade. He emphasised the need to understand this in relation to monetary aggregates and financial stability, beyond the unique context of the COVID-19 pandemic.

**Ignazio Angeloni** suggested leaving the pandemic period out of analysis for monetary aggregates, as it was too special and short-lived. He shared his opinion that there was an under appreciation of the risks of excessive money supply and an over appreciation of deflationary risks in the years leading up to the pandemic.

**Anthony Smouha** (Atlanticomnium SA) proposed that supervisory authorities should better analyse large exposures and ensure that banks have internal oversight for risk management. He highlighted supervisors did not adequately address that Credit Suisse's risk issues, suggesting a need for more rigorous supervision.

**Marlene Amstad** responded by noting that FINMA had enforced measures at Credit Suisse, such as implementing a senior manager regime to delineate responsibilities clearly. However, she highlighted the lack of sanctioning power in Switzerland, which she argued is essential for providing clear and strong market signals about the urgency and magnitude of supervisory concerns.

**Amlan Roy** (Lane Clark & Peacock, LSE) noted that the recent failures were due to a lack of risk management, unlike previous periods when risk management was in place but ignored.

**Reto Cueni** (Vontobel Asset Management) expressed concern about automatic triggers in regulatory frameworks, citing Goodhart's Law, which suggests that when a measure becomes a target, it ceases to be an effective measure. He proposed an alternative setup for regulators. One team would support and improve banks, while another would make tough decisions about the banks' viability. He stressed the need to align incentives properly and emphasised the role of ownership in ensuring good governance.

**Marlene Amstad** responded that most supervisory authorities already separate teams for different tasks, including ongoing supervision and enforcement.

**Beatrice Weder di Mauro** agreed that shareholders should have the right incentives but pointed out the agency problems that necessitate regulation, especially for systemically important institutions.

**Nathan Sussman** (Geneva Graduate Institute) noted that while the Federal Reserve's monetary base declined significantly starting a year and a half before the US bank failures, deposits (both insured and uninsured) continued to increase. He highlighted that this disconnect between the monetary base and deposits indicates a shift in the traditional relationship between these ratios.

**Ignazio Angeloni** responded that changes in deposit regulation, including reserve requirements, might explain the observed changes in the relationship between the monetary base and deposits.

**Fiona Frick** (Circe Invest) asked about ways to move from local to European banking regulation and the feasibility of incentivising large European bank mergers.

**Ignazio Angeloni** discussed the partial centralisation of banking regulation in Europe. While European authorities fully supervise large banks, they do not centralise resolution and deposit insurance, leaving the banking union incomplete. He highlighted pushback from national entities, particularly those with vested interests in segments like small and medium banks in Germany, agricultural banks in Italy, and cooperatives in Austria. He suggested focusing on cross-border banks, which share more homogeneous needs and structures, to drive banking integration.

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# Appendix: List of all banks used in the analysis in Chapters 2 and 3

| Bank name | Country code | CapIQ_Ticker | G-SIB | Total assets | Tier1 ratio |
|---|---|---|---|---|---|
| HSBC Holdings plc | UK | HSBC-US | 1 | 2760 | 0 |
| BNP Paribas S.A. | FR | BNP-ENXTPA | 1 | 2666 | 0 |
| Groupe Crédit Agricole | FR | ACA-ENXTPA | 1 | 2168 | 0 |
| Banco Santander S.A. | ES | SAN-BME | 1 | 1735 | 0 |
| Barclays PLC | UK | BARC-LSE | 1 | 1707 | 0 |
| Groupe BPCE | FR | | 1 | 1531 | 0 |
| Société Générale S.A. | FR | GLE-ENXTPA | 1 | 1485 | 0 |
| Deutsche Bank AG | DE | DBK-XETRA | 1 | 1337 | 0 |
| Confédération National du Credit Mutuel | FR | | | 1108 | 0 |
| UBS Group AG | CH | UBSG-SWX | 1 | 1033 | 0 |
| Intesa Sanpaolo S.p.A. | IT | ISP-BIT | | 976 | 0 |
| ING Groep N.V. | NL | INGA-ENXTAM | 1 | 968 | 0 |
| UniCredit S.p.A. | IT | UCG-BIT | | 858 | 0 |
| Standard Chartered PLC | UK | STAN-LSE | 1 | 767 | 0 |
| La Banque Postale | FR | | | 746 | 0 |
| Banco Bilbao Vizcaya Argentaria S.A. | ES | BBVA-BME | | 712 | 0 |
| Coöperatieve Rabobank U.A. | NL | | | 629 | 0 |
| DZ Bank AG Deutsche Zentral-Genossenschaftsbank | DE | | | 627 | 0 |
| CaixaBank S.A. | ES | CABK-BME | | 599 | 0 |
| Nordea Bank Abp | FI | NDA SE-OM | | 595 | 0 |
| Credit Suisse Group AG | CH | | 1 | 538 | 0 |
| Danske Bank A/S | DK | DANSKE-CPSE | | 510 | 0 |
| COMMERZBANK Aktiengesellschaft | DE | CBK-XTRA | | 477 | 0 |
| J.P. Morgan SE | DE | | | 436 | 0 |
| ABN AMRO Bank N.V. | NL | ABN-ENXTAM | | 380 | 0 |
| KBC Group NV | BE | KBC-ENXTBR | | 355 | 0 |
| Landesbank Baden-Württemberg | DE | | | 324 | 0 |
| Erste Group Bank AG | AT | EBS-WBAG | | 324 | 0 |
| Skandiaviska Enskilda Banken | SE | SEB A-OM | | 317 | 0 |
| Svenska Handelsbanken | SE | SHB A-OM | | 310 | 0 |
| DNB BANK ASA | NO | DNB-OB | | 307 | 0 |
| Bayerische Landesbank | DE | | | 259 | 0 |
| Swedbank | SE | SWED A-OM | | 256 | 0 |
| Banco de Sabadell S.A. | ES | SAB-BME | | 251 | 0 |
| Nykredit Realkredit A/S | DK | | | 215 | |

| Bank name | Country code | CapIQ_Ticker | G-SIB | Total assets | Tier1 ratio |
|---|---|---|---|---|---|
| Landesbank Hessen-Thüringen Girozentrale | DE | | | 212 | 0 |
| Raiffeisen Bank International AG | AT | RBI-WBAG | | 207 | 0 |
| Banco BPM S.p.A. | IT | BAMI-BIT | | 190 | 0 |
| Iccrea Banca S.p.A. - Istituto Centrale del Credito Cooperativo | IT | | | 174 | |
| BPER Banca S.p.A. | IT | BPE-BIT | | 152 | 0 |
| Bank of Ireland Group plc | IE | BIRG-ISE | | 151 | 0 |
| OP Osuuskunta | FI | | | 134 | 0 |
| Barclays Bank Ireland PLC | IE | | | 133 | 0 |
| AIB Group plc | IE | A5G-ISE | | 130 | 0 |
| BANCA MONTE DEI PASCHI DI SIENA S.p.A. | IT | BMPS-BIT | | 120 | 0 |
| Norddeutsche Landesbank Girozentrale | DE | | | 109 | 0 |
| Bankinter S.A. | ES | BKT-BME | | 108 | 0 |
| Caixa Geral de Depósitos SA | PT | | | 103 | 0 |
| Jyske Bank A/S | DK | JYSK-CPSE | | 101 | 0 |
| Unicaja Banco S.A. | ES | UNI-BME | | 99 | 0 |
| Cassa Centrale Banca - Credito Cooperativo Italiano S.p.A. | IT | | | 93 | 0 |
| Powszechna Kasa Oszczednosci Bank Polski S.A. | PL | PKO-WSE | | 92 | 0 |
| Mediobanca - Banca di Credito Finanziario S.p.A. | IT | MB-BIT | | 91 | 0 |
| Banco Commercial Portugues SA | PT | BCP-ENXTLS | | 90 | 0 |
| OTP Bank Nyrt. | HU | OTP-BUSE | | 82 | 0 |
| Eurobank Ergasias Services and Holdings S.A. | GR | EUROB-ATSE | | 81 | 0 |
| National Bank of Greece S.A. | GR | ETE-ATSE | | 78 | 0 |
| ALPHA SERVICES & HOLDINGS S.A. | GR | ALPHA-ATSE | | 78 | 0 |
| ABANCA Corporacion Bancaria S.A. | ES | | | 76 | 0 |
| PIRAEUS FINANCIAL HOLDINGS S.A. | GR | TPEIR-ATSE | | 76 | 0 |
| de Volksbank N.V. | NL | | | 73 | 0 |
| Goldman Sachs Bank Europe SE | DE | | | 67 | 0 |
| Kutxabank S.A. | ES | | | 67 | 0 |
| HASPA Finanzholding | DE | | | 61 | 0 |
| Volkswagen Bank GmbH | DE | | | 61 | 0 |
| Bank Polska Kasa Opieki S.A. | PL | PEO-WSE | | 60 | 0 |
| SBAB Bank AB | SE | | | 57 | 0 |
| Deutsche Apotheker- und Ärztebank eG | DE | | | 54 | 0 |
| Länsförsäkringar Bank AB | SE | | | 41 | 0 |
| Sydbank A/S | DK | SYDB-CPSE | | 24 | 0 |

CENTRE FOR ECONOMIC POLICY RESEARCH

ICMB INTERNATIONAL CENTER FOR MONETARY AND BANKING STUDIES

CIMB CENTRE INTERNATIONAL D'ETUDES MONETAIRES ET BANCAIRES

In March 2023, several large banks in the United States and Switzerland failed despite much reform post-global financial crisis. Large public interventions were necessary once again.

This report documents that besides incomplete reforms – Basel III is still not fully implemented – expansionary monetary policies added to the vulnerabilities. Low interest rates and quantitative easing following the global financial crisis and during the pandemic boosted short-term deposits, leading to large maturity mismatches. As interest rates rose, many banks faced liquidity withdrawals, leading to solvency problems at the riskiest ones. Correcting this calls for better integrated monetary and financial stability policies. Additionally, better lender-of-last-resort regimes in a world of near instantaneous withdrawals are needed.

Globally, especially for systemic banks, sounder recovery regimes require prompt and forceful early supervisory actions to make a weak bank quickly sound again and to mitigate the risk and consequences of runs. Resolution regimes need strengthening, including earlier use of contingent debt conversion, greater ease in moving liquidity and capital intra-group, sufficient public liquidity backstops, and more options, including open bank bail-in. Reduced fragmentation and better coordination among agencies nationally and internationally would help improve supervisory effectiveness.

For the United States, funding fragilities that once again can trigger solvency runs remain large. With commercial real estate exposures also significant, requiring banks with capital shortfalls to promptly raise new equity would help prevent runs. Supervisory stress tests should include more challenging interest rate scenarios.

In Europe, bank capitalisation and liquidity have improved, but valuations of many banks remain low even as their profitability has risen recently. Importantly, with the Banking Union still incomplete – there is no single deposit guarantee scheme and funding is often lacking – banking remains largely nation-based, with risks poorly shared. A new bank charter with no limits on the movement of capital and liquidity for banks with the right structure and organisation and committed to support all their entities would help unblock cross-border mergers and acquisitions and lead to more viable business models and market structures.

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