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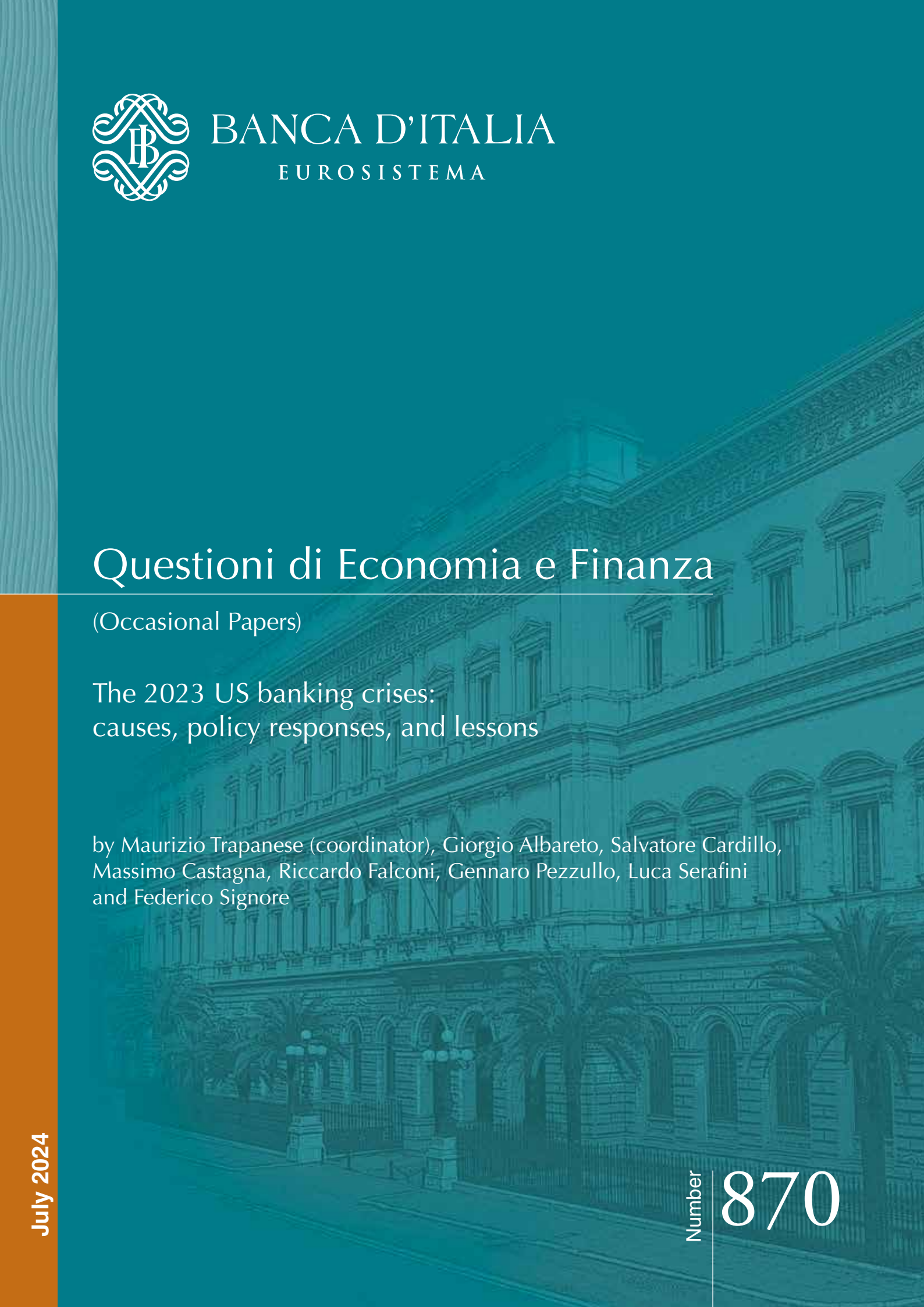
by Maurizio Trapanese (coordinator), Giorgio Albareto, Salvatore Cardillo, Massimo Castagna, Riccardo Falconi, Gennaro Pezzullo, Luca Serafini and Federico Signore



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THE 2023 US BANKING CRISES: CAUSES, POLICY RESPONSES, AND LESSONS

by Maurizio Trapanese (coordinator)*, Giorgio Albareto*, Salvatore Cardillo*, Massimo Castagna***, Riccardo Falconi**, Gennaro Pezzullo***, Luca Serafini*** and Federico Signore**

Abstract

This paper explores whether there are lessons to be drawn from the 2023 US banking crises which can help improve the EU framework for prudential supervision and crisis management. It examines the common features of the US banking failures, the main triggers of the crises and their subsequent dynamics, and outlines the policy responses of the US authorities. These crises are compared with other past banking crises in order to highlight commonalities and differences. As to the policy lessons, the paper underlines that: supervisory authorities should pay greater attention to the fact that the crises of banks not labelled as systemic could also have systemic implications; financial stability could be undermined by an incomplete application of the internationally agreed prudential standards; targeted revisions of the EU prudential rules could be taken into consideration, once the work at the global level is finalized; with reference to specific aspects, the degrees of flexibility in the EU system for crisis management could be widened. Finally, the paper examines the pros and cons of an increase in the level of deposit protection in the EU.

JEL Classification: G01, G21, G28, H12.

Keywords: financial crises, banks, financial policy and regulation, crisis management.

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1. The objective of this paper (Introduction) [1]

The objective of this paper is to explore whether there are lessons to draw from the 2023 US banking turmoil to improve the prudential framework and the tools currently in place in the EU to manage banking crises of a potentially systemic importance. We focus our analysis on the failures of three US mid-sized banks, namely Silicon Valley Bank (SVB), Signature Bank of New York (SBNY), and First Republic Bank (FRB), and on the policy response of the US authorities in the immediate aftermath of the crisis.[2] Taken together with the crisis affecting in the same weeks Credit Suisse (CS), a global bank,[3] the 2023 banking failures represent the most important episode of banking distress since the global financial crisis (GFC) of 2007-08.[4]

These three US bank failures have had largely distinct causes; however, there were common fragilities in their business model (e.g., long-term assets funded with highly volatile, short-term liabilities), exposing them to a huge impact from the rise of interest rates, and large unrealized losses on securities held at amortized cost, with significant effects on their solvency conditions. These banks also had a very large amount of uninsured deposits, mostly accumulated in the years shortly before of the crisis. The failure to manage the rising interest rate risk led to potentially huge losses for ninsured depositors and a potential system-wide run. The high speed of deposit withdrawal played a very important role, determining on average very large liquidity outflows.[5]

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[1] We wish to thank Paolo Angelini, Alessandra De Aldisio, Alessio De Vincenzo, Giuseppe De Martino, Michele Lanotte, Sebastiano Laviola, Anna Marra, Mario Quagliariello, and Valerio Vacca, for their very useful comments on earlier versions of this paper. The opinions expressed here do not necessarily represent the positions of the Bank of Italy. Any errors remain the authors' own responsibility.

[2] The crises of these mid-sized banks were among the most serious bank failures in the US history, as for the assets involved. See: FDIC (2023a), FDIC (2023b), and FDIC (2023c).

[3] The paper does not include in the analysis the crisis of CS, since this episode involves problems of a more idiosyncratic nature. For more details on the specificities of the 2023 banking crises, see: Barr (2023); Hernandez De Cos (2023); Gruenberg (2023b); Laboureix (2023); FDIC (2023d, and 2023e); and Swiss Federal Department of Finance (2023).

[4] Between 2001 and 2020, 561 banks failed with an overall value of $721 billion of assets and $522 billion of deposits, while in 2023 (after two years without bank failures in the USA), the three banks (SVB, SBNY and FRB) failed with overall $532 billion of assets and $440 billion of deposits. Moreover, if SVB experienced more than $40 billion of deposit withdrawals in one day (see below), the largest previous run occurred in 2008 when Washington Mutual faced $16.7 billion in withdrawals over ten days. See: CRS (2023b); FDIC (2024a); and NYU (2023).

[5] Among the triggers of depositors' behaviour, one can include the recent changes in technology, the facilitator role of the modern social media, and the level of uninsured deposits. See Angelini (2023).

The effects of the US regional banks' failures propagated, affecting first other intermediaries in the US financial system, particularly other regional banks, with no or very limited direct links with these banks (the so-called 'contagion by analogy'), and in a second step also foreign intermediaries and markets. This confirms the substance of financial stability concerns potentially deriving from the failures of relatively small intermediaries.[6] The prompt intervention of the US authorities contained the spreading of the crisis, mostly through a number of emergency measures, including the activation of the Systemic Risk Exception (SRE).

A crucial factor in the 2023 US banking crisis has been played by the regulatory initiatives undertaken in the US since 2018, which have 'tailored' some key prudential standards in line with the size and risk profile of the supervised institutions. Accordingly, a number of important post-GFC internationally agreed standards was not applied to mid-size or regional banks.[7]

The US banking turmoil reopened the debate on the effectiveness of the post-GFC prudential and crisis management frameworks and on their correct implementation. The Basel Committee on Banking Supervision (BCBS) has undertaken an analysis of the events, with the objective to derive lessons for improving banking regulation and supervision (see Box No. 1); while the Financial Stability Board (FSB) is reviewing elements of its post-GFC regulatory reforms, including resolution-related issues (See Box No. 2).[8]

In this context, this paper intends to explore whether the EU authorities (both central banks and regulators) are in a condition to manage smoothly and quickly a crisis of a potential similar magnitude, given the EU institutional architecture for resolution and supervision and the legal framework currently in place. We devote our attention to the prudential tools aimed at managing the interest rate and liquidity risks, to the absence in the EU of a financial stability exemption to use in a 'flexible' mode in a crisis and to the issue of the optimal level of protection for banks' deposits.[9]

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[6] The overall effect was in terms of an increased level of price volatility and long-lasting modifications in investors' confidence, with high peaks never experienced since the GFC. See: BCBS (2023b); and Signorini (2023).

[7] For an in-depth examination of the US deregulation in 2018-2020, see: Trapanese (2020); Turner (2023); Smith and Palma (2023); Wilkes (2023), and Angelini (2023).

[8] See: BCBS (2023a); BCBS (2023b); FSB (2023a); and FSB (2023b).

[9] The decision of the US authorities to resort to exceptional measures also in derogation from the ordinary rules has reopened the discussion on the optimal level of deposit protection and more in general on the trade-off between discretion vs rules in the field of crisis management. See Angelini (2023).

The paper is organised as follows. Paragraph 2 goes through the common features of the failures of SVB, SBNY, and FRB, outlining the specificities of their business models. Paragraph 3 examines the main triggers of the crisis and its dynamics, through some theoretical models. Paragraph 4 analyses the banking policies of the US authorities in the years ahead of the crisis, , and the lessons learnt. Paragraph 5 illustrates the responses of the US authorities to the crises, and the impact of the resolution decisions on the Deposit Insurance Fund (DIF). Paragraph 6 compares the 2023 US banking turmoil with other US and EU banking crises. Paragraph 7 outlines the points of strength of the EU regulatory framework as compared to the US, and at the same time its 'missing' elements, above all in the toolkit for crisis management. Paragraph 8 concludes.

2. The specificities of the 2023 US banking turmoil

2.1 The external macro-financial environment

In this paragraph, we start investigating the role of the macro-financial environment in the years ahead of the 2023 crises on banks' risks.[10] The attention is on the relationship between the fiscal and monetary policies adopted in most jurisdictions, including the US, to limit the effects of the 2020 pandemics and the other subsequent worldwide geopolitical tensions and the individual banks' risk-taking. While these expansionary macroeconomic policies were neither necessary nor sufficient to cause the increased level of fragility of the US banking system, it is possible to identify the main channels for the impact of these macro policies on the banks' risks.[11]

As to monetary policy, the commitment of central banks to keep interest rates at the lowest levels for a long period after the GFC, and their massive asset purchase programmes (QEs) has contributed to the build-up of public and private debt, and to a reduction in banks' margins, fostering a general search for yield and relatively easy financial conditions overall. Moreover,

[10] A detailed investigation on the causes, specificities and policy response of the 2023 banking crises is in the reports published in 2023 by the several US authorities involved. We refer to the following authorities and reports. The Federal Reserve Board (Fed Board, 2023); the US Government Accountability Office (GAO, 2023); the Californian Department of Financial Protection and Innovation (CADFPI, 2023); the Federal Deposit Insurance Corporation (FDIC, 2023a, 2023b, and 2023c); the New York State Department of Financial Services (NYSDFS, 2023); and for the SVB UK a letter by the Bank of England (BoE, 2023). This paragraph derives mainly from these reports.

[11] For a more in-depth analysis of the macro-financial backdrop in the US in the run up to the 2023 banking stress episodes, see Acharya et al. (2023).

fiscal policies have been highly expansive to mitigate the effects of the pandemic, contributing to an increased level of debt in the system (CGFS, 2023).

Low-for-longer interest rates have encouraged banks to increase interest rate risk, since securities investment have become more attractive. Furthermore, especially during and after the pandemics, monetary expansions and QEs have contributed to increase fiscal policies and public expenditures, in order to ensure protection to economic sectors, thus fostering deposit growth, especially in the form of uninsured deposits. The same effects are determined by the large-scale fiscal transfers occurred in recent years. If banks on average take on higher interest rate risk funded via volatile un-insured deposits, the underlying factors for a shock have been built in the case of a rapid interest rates rise in a counter-inflation policy reversal.

This was exactly what happened in 2022, when monetary policy conditions tightened in most jurisdictions to curb high inflation. The resulting increase in interest rates and quantitative tightening determined a worsening in financial conditions overall and a sharp reduction in the value of long-duration fixed interest assets.[12]

2.2 The impact of specific business models

Between 2018 and 2022, the three US mid-sized banks that failed in 2023 had grown substantially, through a very rapid expansion of their banking activities towards the most innovative sectors and benefited from the correlated increase in their deposit base. In particular, the deposit inflows derived from: private and commercial banking services to venture capital and technology sectors, which experienced strong positive results in the years of exceptionally low interest rates;[13] commercial real estate and commercial/industrial lending;[14] banking services

[12] Three more structural factors may have had the potential to contribute indirectly to some of the fragilities appeared during the 2023 banking turmoil: the significant growth of the non-bank financial intermediation and its, often opaque, interconnections with the banking system; the emergence of a complex crypto-asset system; and the ongoing digitalisation of finance. For more details on these developments, see BCBS (2023b).

[13] This is the case of SVB, a subsidiary of SVB Financial Group (SVBFG), closed on 10 March by the Californian Department of Financial Protection and Innovation (CADFPI), which appointed the FDIC as receiver. SVBFG was a large bank holding company with approximately $212 billion in total assets and $192 billion in deposit liabilities when it failed. See: BCBS (2023b); and CADFPI (2023).

[14] The reference here is to SBNY closed on 12 March, by the New York State Department of Financial Services (NYSDFS), which appointed the FDIC as receiver. With total assets of $110.4 billion at the end of 2022, SBNY was the 29th largest bank in the country, and its failure constituted the third largest bank failure in the US history. SBNY was more diversified than SVB, but it also had a high concentration of uninsured deposits. Since 2018, SBNY had

offered to high net worth individuals, including residential real estate lending, private banking, wealth management, and brokerage services.[15]

These deposits were largely uninsured, on a scale not comparable with the figures of peer banks, and were invested mainly in securities with very long-term maturities. This overreliance on uninsured deposits was pursued without implementing effective liquidity risk management practices and controls. When the interest rates curve began to reverse in 2022, these banks saw an increase in unrealized losses on long-term securities on the asset side of their balance sheet and deposit outflows.[16]

During the second half of 2022 and the first months of 2023, liquidity conditions of the affected banks weakened, unrealised losses accumulated on their securities holdings, and their performance outlook deteriorated significantly. In an effort to avoid the materialisation of risks on their balance sheets, these banks planned a number of "last-minute" mitigating actions: selling their available for sale (AFS) securities; increasing term borrowing; booking after-tax loss; raising capital on the markets. This notwithstanding, these banks experienced bank runs, as withdrawals of uninsured deposits accelerated. These deposits outflows – reinforced by the use of social media - played as a multiplier for even stronger concerns about the banks' liquidity and solvency. A number of interrelated factors appeared to be in action: growing uncertainty about the health of the venture capital and technology firms, possible spillovers from potentially negative assessments by credit agencies, highly correlated and coordinated – on unprecedented dimension and speed – withdrawals from their primary clients (i.e., venture capital and tech firms).[17]

In one case, contagion effects played a key role, as was the case of the failure of SBNY, whose liquidity conditions precipitated in the wake of the announced self-liquidation of Silvergate

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expanded a business model based upon lending and deposit taking initiatives, primarily versus digital assets related firms, doubling the bank's size in terms of deposits. See: BCBS (2023b); and NYSDFS (2023).

[15] This applies to FRB closed by the CADFPI on 1 May. As of the end of March 2023, FRB had total assets of $232.9 billion and total deposits of $104.5 billion, of which almost 50 per cent were uninsured. FRB was the 14th largest bank in the US, and the 2nd largest bank supervised by the FDIC. See: FDIC (2023c); and Gruenberg (2023b).

[16] In the case of SVB, the crucial shock arrived on March 8, when the bank announced that it had sold $24 billion of book value securities for a loss of $1.8 billion. This announcement contained new information. By selling the securities, SVB was now required to recognise these losses on its income statement and balance sheet, that is, the losses were now 'realized'. See Metrick (2023).

[17] These deposit outflows were remarkable in terms of scale and scope if compared with other episodes of banking crises occurred during the GFC of 2007-08. See BCBS (2023b).

Bank on 8 March, and the failure of SVB on 10 March. This also because the bank's inadequate risk control systems determined the inability to manage liquidity in a period of stress, making the bank unable to meet very large deposits withdrawals.

Following the failures of SVB and SBNY during the weekend of 10 March, FRB suffered a loss of market and depositor confidence, which determined liquidity strains due to significant outflows of uninsured deposits. These contagion effects were exacerbated since FRB balance sheet had features similar to SVB's, mainly in terms of high levels of uninsured deposits and differences between the fair value and the book values of loans and long-term assets. Furthermore, FRB operated in the same geographic markets as SVB, having the same types of clients on both sides of the balance sheet.

The failure of SVB also led to a loss of confidence in its UK subsidiary.[18] The problem here was primarily in terms of concentration risk, since the bank provided loans and took deposits from the same concentrated clients in the high technology sectors.[19] The massive deposit run the bank experienced over few hours in the same day its US parent was closed – approximately, one third of its total deposit base - was the definite trigger for resolution decision by the Bank of England.[20] In the assessment of the UK authorities, the UK SVB subsidiary could not become a stand-alone entity, because of its strong reliance on its US parent for technology and systems, including payment infrastructure.

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[18] SVB UK had operated in UK since 2012, first as a UK PRA-FCA dual-regulated branch, and since July 2022 as a subsidiary. SVB UK was a relatively small bank with total assets amounting approximately to £ 12 billion, with deposits of over £ 10 billion and no critical functions supporting the UK financial system. It was focused mainly in technology, life sciences and healthcare. Its clients were start-ups, large corporates, venture capital and private equity funds.

[19] This type of risk has been an increasing concern for the UK prudential authority since 2021. It was discussed several times with both the firm and the Federal Reserve. The concentration in assets and the interest rate risk in the banking book was recognised in SVB UK's Pillar 2 capital requirements. See BoE (2023).

[20] Over the weekend of 10-12 March, the Bank of England, after consultations with the other UK authorities, and following an interest emerged from HSBC in purchasing assets and liabilities of the failed bank, determined that the statutory conditions for the exercise of its stabilisation powers were met. So, the shares of SVB UK were transferred to HSBC, which had provided the most credible offer to ensure the continuity of SVB UK's deposits through using the BoE's resolution powers. On Monday 13 March, the BoE announced a transfer of all SVB UK shares to HSBC for £ 1 and the simultaneous write-down of the bank's AT1 and Tier 2 instruments, which were held by its US parent. See: FSB (2023b); and BoE (2023).

2.3 The role of the internal control systems

Important explanatory factors of the crises are to be found in major shortcomings directly related to these banks' governance and internal control systems. First, the Board of Directors and senior management failed to take under proper control the risks stemming from the banks' business model and balance sheets strategies. Second, the risk-control functions failed to manage the rapid asset growth, thus increasing the banks' accumulation of structural weaknesses. Third, these banks failed to develop sufficient contingent funding capacity, tailored to build up appropriate collateral and operational arrangements, in order to deal with adverse market liquidity conditions.[21]

In the case of SVB and SBNY, before the normalization of monetary policy, the Board of Directors was not fully aware of the incoming risks inherent to the bank's business model and strategy, which had determined a very rapid growth in total assets, on a scale not occurred in the recent past for other banks of similar size. For example, the information sent to the SVB Board of Directors by the management did not signal liquidity risks until November 2022, despite rapidly deteriorating conditions.[22] Furthermore, SVB removed interest rates hedges that would have protected against interest rates reversals, and compensation schemes for senior managers have been tied to short-term earnings and equity returns and did not include risk metrics, with a strong and negative impact on risk taking behaviour of the bank. In the case of SBNY, the management did not prioritize adequate risk management practices and controls appropriate for the size, complexity and risk profile of the bank.[23] Moreover, SBNY managers failed to deal with the concentration risk stemming from the reliance on crypto industry deposits or with the exposure to contagion from the crypto industry turmoil occurred in late 2022.

In this context, the internal control committees and systems devoted little attention to the depositor run-offs from crypto and traditional customers experienced in the months before the

[21] SVB did not test its capacity to borrow at the FED Discount Window during 2022 and did not have appropriate collateral and operational arrangements in place to obtain liquidity. These shortcomings have had an impact on the way the failure has been decided and managed by the authorities. SBNY as well experienced operational weaknesses with regard to its contingency funding plans, which continued to determine important implications even in the hours of the failure. See FRB (2023).

[22] According to Metrick (2023), at the end of the third quarter of 2022, the deterioration of SVB solvency conditions, due to losses on the assets side of the balance sheets, were well known through the market participants.

[23] SBNY's Board of directors and management pursued a very rapid and unrestrained growth of total assets, which increased by 175 per cent in the 4-year period 2017-2021. A slight decline occurred only in the months immediately preceding the failure, at the end of 2022. See BCBS (2023b).

failure. In the case of FRB, the decisions by senior managers to retain a business model based upon a high degree of maturity mismatch between assets and liabilities – decision maintained while central banks increased the level of interest rates - contributed to a loss of confidence on the bank. The significant withdrawals of deposits ultimately limited the options to save the banks to unfeasible ones, such as, restructure the balance sheet, sell assets, or raise capital on the markets.

The case of FRB reveals that a bank[24] may go into trouble and fail, in the case the business models and the firm's strategies maintain and implement elements that make the bank more vulnerable to external shocks. The FRB business model allowed: a very rapid growth in total assets; a high level of clients' loans and deposits concentration; an overreliance on uninsured deposits; significant drawbacks in managing and mitigating interest rate risk.

3. Triggers and mechanisms of the crises: insights from theoretical models

3.1 The triggers: "franchise value of deposits", uninsured deposits and long-term assets

A number of theoretical models can help to understand the relationship between the specificities of interest rate risk management and bank business models in the US and the outbreak of the financial turmoil; other models can help to identify the channels through which single episodes of financial distress can spread across other intermediaries, thus determining a systemic crisis.

Interest rate risk management in the US is characterized by some specificities. First, it is affected by the lack of an effective interest rate risk regulation: publicly listed US banks face requirements to annually disclose their interest rate sensitivity, but not to publish these metrics as part of their quarterly regulatory filings for bank regulators (Feldberg, 2023). Besides that, interest rate swaps are not significant to hedge the duration of banks' assets (McPhail at al. 2023).

Dreschler at al. (2021) show that profits from the deposit spread (the difference between the interest rates on Government T-bills and on deposits) [25] have been a remarkably good hedge for

[24] According to FDIC (2023c), FRB has been historically assessed positively by its supervisors. FRB has grown constantly since its establishment in mid 1980s; for years, it has implemented risk management and control systems and procedures proportionate to its risk profile and size. At the time of its failure, FRB was among the largest banks supervised by the FDIC.

[25] Depositors accept a lower return than that they would get in government T-bills because of the transaction services and other perquisites provided by their demand deposits at the bank. The deposit spread is a component, together with the term spread (the difference between the yields on the shortest- and longest-horizon government debt) and the credit

interest-rate risk for US banks. Their analysis shows that deposit rates are quite inelastic to market interest rates, so that an increase in market rates leads to an increase in deposit spreads. In fact, banks have market power over deposits, which allows them to pay a deposit rate that rises less than one-for-one with respect to the market interest rate; the amount by which they do so, the bank's "deposit beta," is thus less than one. The bank thus earns a deposit spread, which rises in proportion with market interest rates. This is the source of the "franchise value of deposits", the net present value of the deposit spread.

The deposit franchise can be considered as an additional asset for banks, but one that is never included in any formal balance sheets.[26] Banks build their business plans around this relationship, trying to maximize the stability of their deposit base.[27] For the deposit hedge to work, deposits must stay in the bank. If they leave, the deposit franchise is destroyed, creating incentives to run, if deposits are uninsured. Deposit outflows can be due to two reasons. The first is the direct impact of interest rates: as interest rates rise, banks widen their deposit spreads, which leads some depositors to shift toward higher-paying alternatives like money market funds (the "deposits channel" of monetary policy). The second reason for outflows is a run by low-beta uninsured depositors[28]. Uninsured depositors have an incentive to run if their deposits exceed the value of the bank's assets in case they run. In standard models (Diamond and Dybvig, 1983), deposits can exceed asset values due to fire sales of the bank's loans, which are illiquid. In the model by Drechsler et al. (2023a) runs are instead due to the nature of the deposit franchise: when a deposit is withdrawn, the bank loses the stream of deposit spreads it would have earned on that deposit. Hence, the deposit franchise is maximally exposed to Diamond-Dybvig runs when interest rates are high, because that is when deposit profits are large relative to the income from the bank's assets. Thus, the risk of a run increases with interest rates, even though the bank is hedged to

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spread (the difference between the interest rates on loans and on T-bills), of the bank net interest margin (Metrick, 2024).

[26] This is because neither the deposit spread banks earn nor the operating cost they pay to maximize the stability of their deposit base are capitalized.

27 In other words, the stickiness of deposits gives banks a form of monopoly power; the rents earned from this power comprise a large portion of bank profits and thus the capitalization of these rents comprises a large portion of the banks' market value.

28 In fact, only low-beta uninsured deposits contribute to the "deposit franchise value". In the past uninsured deposits were primarily large time deposits and other forms of wholesale funding. These deposits have a beta close to one and do not require expensive branch networks. As Drechsler et al. (2023b) show, this changed during the zero lower bound period when uninsured deposits flowed into low-beta checking and savings accounts.

interest rates absent a run. Uninsured depositors do not need to understand the notion of franchise value to run; once a run equilibrium exists, a run can be triggered by low earnings, a fall in the stock price, or even a rumor on social media. The key insight is that a run equilibrium only emerges at high interest rates; once it does, even a small change in fundamentals or sentiment can trigger a run.

As long as the deposit base is stable, the expectation of future profits from deposit spreads adds to the solvency strength supporting the deposit stickiness. If deposits lose their stickiness, the value of the "franchise value of deposits" falls and fear of insolvency can cause effective insolvency. An information event that calls into question a bank's solvency can quickly become self-reinforcing. The "franchise value of deposits" increases when interest rates increase and it is low when interest rates are low. If low interest rates persist (like in the long period preceding the rise of interest rates in 2022), banks can therefore come under stress, because the rents (and their capitalization) earned from their power in the deposit market disappear, affecting banks' market value. As a result, holding safe long-term duration securities, such as Treasuries or guaranteed mortgage-backed securities, provides a natural hedge of these losses when interest rates fall.

The problem of holding these securities is that they lose value when interest rates rise, causing losses on the asset side of the balance sheet. Significant unrealized losses on long-term assets are exactly the other major trigger of the US banking turmoil in 2023,[29]together with the high level of uninsured deposits (par. 2 above; and Acharya et al., 2023).[30]

3.2 The propagation of the crises: the "aggregate capital shortfall"

Acharya at al. (2016) show that an adverse transmission of a financial firm's distress to the system occurs when there is an aggregate capital shortfall in the financial sector. Intuitively, systemic risk arises when there is a breakdown in the aggregate financial intermediation, that is a collapse in the ability of financial firms to obtain funds from depositors or investors and to provide

[29] Even if the implied losses in the banks' securities portfolio have been identified as on of the major driver of the financial turmoil, they were not adequately considered in either the regulatory stress test scenarios or the investors' risk pricing ex ante (Choi at al., 2023).

[30] The model by Dreschler at al. (2023) implies a risk management dilemma: the bank can hedge itself to interest rates or liquidity risk, but not to both. If it hedges to interest rates, it becomes exposed to a run if interest rates rise. If it hedges to liquidity risk, it becomes exposed to insolvency if rates fall. The dilemma disappears only if uninsured deposits do not contribute to the bank's deposit franchise; this happens if they do not earn a deposit spread, i.e. if they are effectively wholesale funding.

financing to other firms. If one financial firm becomes unable to perform intermediation services, but all other financial firms continue to have ready access to capital, the consequences for the economy as a whole are likely to be minimal since other firms can simply substitute the failed one.

When capital is low in the system, however, that is not possible. Acharya at al. (2016) build a model of systemic risk and show that each financial institution's contribution to systemic risk can be measured as its 'systemic expected shortfall', i.e. its propensity to be undercapitalized when the system as a whole is undercapitalized. Thus, it is not the individual institution's capital shortfall per se, but its contribution to the aggregate capital shortfall that matters when attempting to assess its systemic importance.[31] In the case of the US banking turmoil, the loss in deposits determined the bank's contribution to the aggregate capital shortfall: when depositors left the bank, the exposure to interest rates on the asset side was not hedged anymore through the "deposit franchise value" and some banks faced insolvency.

In an extension to the model of Acharya, Pedersen, Philippon, and Richardson (2016), Acharya, Philippon, and Richardson (2016) point to externalities arising from both an aggregate capital shortfall in the economy and fire sales as results of runs on financial firms' liabilities. They show that a financial firm contributes to systemic risk through its contribution to the aggregate capital shortfall and through its liability structure which impacts the likelihood of runs and forces fire sales. A corollary of the model important for explaining the US banking turmoil is that if i) banks' loans and security holdings are long duration in nature, that is exposed to movements in interest rates, and ii) bank liabilities are runnable, such as uninsured deposits or sale-and-repurchase (repo) agreements, then a significant rise in interest rates could become a source of vulnerability to "runs" for the most exposed parts of the banking system.

In turn, if the vulnerability materializes, it could impose a negative externality on the rest of the financial system and the economy; these externalities can be produced in excess because incomplete markets make it difficult an adequate pricing of them. In other words, "the coupling of interest rate sensitive security holdings and a high level of uninsured deposits would suffice to

[31] The model by Acharya, Pedersen, Philippon and Richardson (2016) is strictly related to the inherent tension between microprudential and macroprudential regulation of the financial sector, based on the intuition that even if banks manage risks well on an individual basis the banking system is not guaranteed to be collectively safe (Acharya, 2009). In other words, while individual risks may be properly dealt with in normal times, the system itself remains fragile and vulnerable to large macroeconomic shocks.

produce too much unpriced systemic risk in aggregate" (Acharya et al., 2023). The model identifies some relevant parameters that drive the systemic risk of banks, such as the amount of the firm's assets, the systematic risk of those assets, the leverage of the firm and the firm's liquidity mismatch.

An alternative perspective is that financial crises can occur when the economy is hit by shocks if financial firms rely significantly on short-term financing, so that there is a risk the financing of these firms does not get rolled over (Allen and Gale, 2000; Diamond and Rajan, 2001 and 2005). If a run on liabilities of a sufficient number of financial firms takes place, these firms are potentially forced to sell assets to cover the financing at potentially fire-sale prices. Moreover, absent the availability of long-term capital in the economy, even small shocks can lead to runs on the liabilities (Acharya et al., 2009). These runs can lead to fire sales that amplify throughout the financial sector, not dissimilar from the impact of an aggregate capital shortfall of the financial system.

4. Regulatory 'tailoring' and supervision in the US

4.1 The US regulatory cycle

To understand the rationale that led to the 2023 crises of the three US regional banks is worth mentioning that an important part of the academic literature has discussed the direct link between deregulation in financial markets and boom-bust episodes, which nowadays even more clearly appears to be a repeating cycle. This regularity can be found in the case of the US, where the earliest regulation on the financial sector can be traced back to the 1907 bank run and found again when the Great Depression of 1929 led to the first stringent regulation of the financial sector, with the 1933 Glass-Steagall Act. The lack of stringent rules able to constrain financial activities paved the way for another financial crisis, the GFC of 2007-08. [32] The regulatory response to it was the 2010 Dodd-Frank Act (DFA), which enhanced regulation and supervision of banks and financial institutions (Trapanese, 2020). The impact on the Federal Reserve's oversight framework was huge. The Federal Reserve Board of Governors (BoG) established a set of "enhanced prudential standards" (EPS) for large banking organizations with total consolidated assets of $50 billion or

[32] In the economic literature, there is nowadays a widespread view that the years leading to the GFC saw an increased deregulatory stance of the financial markets and the advent of the so-called *light-touch* approach to regulation in banking and financial market. (Trapanese, 2020).

more. This included liquidity, capital, stress testing, and resolution planning requirements in order to improve the resilience of large banking organizations (Fed Board, 2023b).

Since its introduction, the DFA has attracted a significant debate about its effectiveness, with detractors arguing it was unnecessarily restrictive and costly for the financial industry, as well as impractical to implement for the supervisory agencies. The massive campaign for amending or even repealing the DFA culminated with the advent of the Trump Administration in 2017, whose legislative actions resulted in the roll back of the main provisions of the DFA. This process reverted the regulatory cycle and paved the way to a new form of light-touch approach under the name of regulatory tailoring that again produced a structural change in the supervisory and regulatory approaches in the US (Trapanese, 2020).

4.2 The deregulation of the US banking system

There is no doubt that a role in the 2023 banking crisis was played by the regulatory initiatives undertaken in the US, starting in 2018 with the Economic Growth, Regulatory Relief, and Consumer Protection Act (EGRRCPA), which amended the Dodd-Frank Act by raising the $50 billion minimum asset threshold for general application of EPS to $250 billion. Additionally, EGRRCPA provided the BoG with discretion for applying EPS to bank holding companies with total assets between $100 and $250 billion (Fed Board, 2023b). In response, in 2019 the BoG established four categories (Category I-II-III-IV) of US and foreign banking organizations with increasingly stringent requirements for larger and more complex firms whose failure could affect the financial stability (Federal Register, 2019;):

1. Category I includes G-SIBs for which the most stringent prudential standards apply:
    i. Capital: use of the standardized and the advanced approaches (internal models) for the calculation of the capital ratios allowed, requirement to recognize in regulatory capital unrealized gains/losses on OCI (other comprehensive income) securities, use of countercyclical capital buffer and enhanced supplementary leverage ratio standards[33], GSIB surcharge, TLAC requirements;
    ii. Liquidity: Liquidity Coverage Ratio (LCR) >=100%, NSFR[34] >=100% (daily reporting);

[33] The enhanced supplementary leverage ratio is a higher leverage ratio requirement applicable to Category I banking organizations.

[34] In 2019 the NSFR requirement was not in charge. The US NSFR regulation was finalised and published in February 2021 with an effective date of 1 July 2021 (BCBS, 2023c).

iii. Stress Testing: annual company-run and supervisory stress tests, annual capital plan;
iv. Resolution plan: every two years, alternating between full and targeted plans
v. Single-counterparty credit limits.

2. Category II includes banking organizations with $700 billion or more in total consolidated assets (or with 75 billion or more in cross-border activity). These banks are subject to enhanced standards with the following reductions relative to Category I:
   i. Capital: no GSIB surcharge and TLAC requirements, only supplementary leverage ratio requirement;
   ii. Resolution plan: every three years, alternating between full and targeted plans.
3. Category III includes banking organizations with $250 billion or more in total consolidated assets (or with at least $75 billion in weighted short-term wholesale funding, nonbank assets, or off-balance sheet exposures). Differences with Category II requirements include the following:
   i. Capital: no internal model approaches for capital requirements allowed, no requirement of accumulated other comprehensive income in regulatory capital;
   ii. Liquidity: if short-term wholesale funding (STWF) is less than $75 billion then LCR and NSFR are calibrated at 85% (monthly reporting), otherwise 100% requirement applies (daily reporting);
   iii. Stress Testing: company-run stress test every two years.
4. Category IV includes banking organizations with $100 billion to $250 billion in total consolidated assets that are not subject to Category I, II, or III standards. They are subject to further reduced requirements relative to Categories III, with the main differences being:
   i. Capital: no countercyclical capital buffer;
   ii. Liquidity: if bank has $50 billion or more in STWF the LCR and NSFR requirement are calibrated at 70% (monthly reporting), if STWF is below the above threshold no LCR requirement applies;
   iii. Stress Testing: supervisory stress testing every two years, no company-run stress test;
   iv. Resolution plan: not required.

The new rules eliminate the enhanced regulatory requirements for banking organizations with less than $100 billion in total assets that, among other, are not subject to liquidity, stress testing and reporting requirements.

In terms of supervisory practices and approach, in April 2021 the BoG adopted a final rule to codify the principle that supervisory guidance does not have the force and effect of law, but rather outlines expectations and appropriate practices for a particular subject area or activity. The Board stated that Supervisors will not criticize a supervised financial institution for, and the Board will not issue an enforcement action based on a ‘‘violation’’ of or ‘‘non-compliance’’ with supervisory guidance: in a nutshell, supervisory guidance does not create legal obligation. It was recalled also the intention to limit the use of numerical thresholds in describing expectations in supervisory guidance (Federal Register , 2021).

4.3 The lessons learnt from the banking turmoil

The 2023 US regional bank crisis put again on the bar the role of banking regulation and supervisory activities as one of the allegedly causes of the stress events, with a role played by the combined effect of changes in the regulation and in the (non-binding) role of the supervisory guidance in exacerbating the effects of that crisis. This correlation is confirmed by the report of the Federal Reserve Board issued in April 2023 for the SVB case, where the supervisory failures in the oversight of the bank are recognised.[35]

In the wake of the 2023 US regional banking crisis, with the view of finalizing the implementation of the final Basel III package, the US agencies , on July 27 2023 published for consultation the so called “Basel III endgame proposal” (FDIC, 2023d), which would substantially revise the regulatory capital framework for banking organizations with total assets of $100 billion or more, reverting the regulatory cycle toward a tighter approach. The resilience of the US banking system would be improved by modifying capital requirements in line with the Basel III accord, and by reviewing the risk-based capital surcharges applicable to the US global systemically important banks (G-SIBs) to better reflect their risks. The proposal would introduce the “expanded risk-based” approach, applied to firms with total assets of $100 billion or more and their subsidiary depository institutions (banks belonging to all the IV Categories I, II, III or IV). In a nutshell:

35 Agency staff repeatedly mentioned changes in expectations and practices for the supervisory activities, including pressure to reduce burden on firms, meet a higher burden of proof for a supervisory conclusion, and demonstrate due process when considering supervisory actions. As a result, staff approached supervisory messages, particularly supervisory findings and enforcement actions, with a need to accumulate more evidence than in the past, which contributed to delays and in some cases led staff not to take action (Fed Board, 2023).

- internal models for credit risk and operational risk would not be allowed anymore. Banking organizations would calculate total risk-weighted assets using: i) a new standardized approach for credit risk and a revised approach for credit valuation adjustment (CVA) risk; ii) a new standardized approach for operational risk; iii) a revised approach to market risk;
- the proposal would maintain the current capital rule's "dual-requirement" structure: large firms (Category I and II) would still be required to calculate their capital ratios under both the new standardized approach (the "expanded risk-based approach") and the existing standardized approach, being subject to the strictest of the resulting ratios;
- the proposal would also align the calculation of regulatory capital requirements for Category III or IV banks with the calculation for Category I or II;
- firms subject to Category III or IV standards would be now required to reflect accumulated other comprehensive income in regulatory capital;
- firms subject to Category IV standards would be subject to the application of the countercyclical capital buffer and the supplementary leverage ratio requirements;
- GSIBs would maintain an additional capital buffer (the GSIB surcharge).

According to the proposal, on a relative basis, the capital requirements would increase somewhat more (19 percent) for Category I and II firms, and moderately less for Category III and IV domestic firms (6 percent), with somewhat larger increases for foreign firms and smaller increases for domestic ones. However, such estimated impacts have been largely opposed in the responses to the consultation, with the industry advocating for a much bigger impact. The proposal of the Board of Governors would amend only the capital framework, thus no changes at the moment are envisaged to the liquidity framework, still based on the existing rules.

Box No. 1: Main takeaways for banking regulation

In the aftermath of the banking turmoil the BCBS started assessing the causes of the crisis episodes, the regulatory and supervisory responses, and the initial lessons learnt. The results of this initial stocktake are included in the report published in October 2023, covering a number of issues which may deserve further attention and additional analyses (BCBS, 2023b).

Liquidity risk. All the crisis episodes were to some extent characterized by a liquidity distress. This put into question the current design and calibration of related requirements (Liquidity Coverage Ratio – LCR and Net Stable Funding Ratio - NSFR). Some issues concerned specifically the usability of liquidity buffer and more specifically the willingness/operational capability to monetize liquid assets in time of stress. The case of Credit Suisse showed that in a severe stress liquid assets may not be fully available to cover liquidity outflows due to other needs (e.g. increased intraday liquidity needs or prepositioning required by counterparties). The case of US banks further showed that the accumulation of unrealised losses on liquid assets valued at amortized cost could represent an impediment to their monetization. However, as highlighted in the report, liquid assets are already considered in the LCR buffer at their market value, thus reflecting any unrealized loss; furthermore, liquid assets at amortised cost can be monetized through repo transactions. Hence, the concrete role played in the recent crisis events by the accounting classification as opposed to other (more idiosyncratic) factors is something that deserves further assessment.

Other evidences refer to deposit outflows experienced in the crises, whose speed and scale highlight possible room of recalibration for the corresponding regulatory parameters (e.g. for uninsured deposits and deposits from wholesale counterparties). The performance of the NSFR as an indicator of structural liquidity mismatch; and the role and frequency of standardised stress indicators to complement the analytical toolbox available to supervisors under Pillar 2 (see BCBS (2023b), Box A "Liquidity outflows of distressed banks – a historical comparison").

Interest rate risk in the banking book – IRRBB. The US distressed banks had in common high exposure to IRRBB. While acknowledging that these banks were partially subject to the IRRBB Basel standard (e.g., they were not subject to specific IRRBB disclosure requirements), the events occurred put into question possible areas of improvement, including on whether the current pillar 2/3 approach can adequately mitigate this risk.

Definition of regulatory capital. The crisis of Credit Suisse in particular has raised doubts on the role of Additional Tier 1 capital instruments (AT1) and their ability to absorb losses on a going-concern basis. The bank continued to make expensive replacement issuances of these instruments and to pay coupons to avoid negative signalling effects, despite the fact that it was reporting losses over several consecutive quarters. Against this backdrop, the report highlighted the need to further assess the complexity, transparency and understanding of AT1 instruments in a holistic manner.

General application of the Basel framework. Along with the issues on specific areas as mentioned above, the report also identified some high-level aspects relating to the scope of application of the Basel framework, that is currently intended for internationally active banks only (with this concept not explicitly defined further). As showed in the US cases, a distress of relatively small/regional banks may nevertheless trigger broader consequences and have systemic implications. One aspect to investigate further is then whether additional guidance on the identification of domestic systemically important banks may be warranted, and how to decline proportionality regimes in a way that does not hinder financial stability.

5. The policy response of the US authorities

5.1 The measures to address the individual banks' failures

On March 9, SVB experienced more than $40 billion of deposit withdrawals, and anticipated more than $100 billion of withdrawals for March 10.[36] In the evening of March 9, the Federal Reserve (FR) informed the FDIC of the possible failure of SVB, following the deposit run and the subsequent funding shortfalls. Shortly thereafter, the FDIC engaged with the CADFPI. On March 10, the CADFPI closed SVB, appointing the FDIC as receiver. The FDIC, in accordance with the least cost requirement (LCReq), created a Deposit National Insurance Bank (DINB), i.e. the Deposit Insurance National Bank of Santa Clara (DINBSC) and transferred to it all insured deposits; at the same time, the FDIC started developing a list of 24 potential bidders to market DINBSC.[37] The FDIC also announced its intent to pay an advanced dividend to uninsured depositors on March 13, when DINBSC was scheduled to reopen.[38]

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[36] In order to avoid the materialization of risks on its balance sheet (see par.2), on March 8, SVB announced the sale of substantially all of its available-for-sale securities, with a $1.8 billion loss on book value of $24 billion, and planned to raise capital totaling $2.25 billion. The sale of securities was announced on the same day on which Silvergate Bank ($11.3 billion of assets as of December 31, 2022 and a business model focused almost exclusively on providing services to digital asset firms) announced that it would self-liquidate. The bank had experienced a 68% loss in deposits (from $11.9 billion to $3.8 billion) in the fourth quarter 2022, following also the collapse of the digital asset exchange FTX in November 2022 and sold debt securities with a net earning loss of 1$ billion. See: Gruenberg (2023b); NYU (2023); and GAO (2023).

[37] The DINB represents one of the tools the FDIC has to resolve the failing bank; the DINB is a temporary bank operated by the FDIC that receives deposits with the aim to ensure depositors have continued access to their insured deposits and allow them to move their deposits to other financial institutions; it can be considered as a form of payout. According to the LCReq, the FDIC must resolve a bank institution using the method expected to have the least cost to the deposit insurance fund.

[38] The FDIC created the DINB and announced the advance dividend in order to minimize disruption for insured depositors and give a relief to uninsured depositors, while working at the resolution. Indeed, the FDIC did not foreclose

On March 11, the FDIC started coordinated efforts with the FR to consider recommending SRE; [39] it also initiated marketing for the DINB, with bids due March 12. On March 12, the NYSDFS closed SBNY and appointed the FDIC as receiver[40]. Subsequently, as bids for SVB were being evaluated, the FR and the FDIC issued the SRE recommendations, then approved by the Secretary of the Treasury, to protect all depositors of SVB and SBNY.[41] The US authorities made a public announcement for the authorization granted to SRE to protect all depositors of SVB and SBNY. On the same day, the FDIC reset the marketing window, in order to enable bidders to bid on an all deposit transaction, and created two bridge banks (Silicon Valley Bridge Bank – SV Bridge Bank – and Signature Bridge Bank) to which all deposits and substantially all of the assets of SVB and of SBNY were transferred. [42] On March 13, the two bridge banks opened and conducted normal business activities.

In this context, on March 15, the FDIC opened marketing for the two bridge banks. The bidding process for the bridge bank of SBNY was the first to find a conclusion. On March 18, after receiving five bids from four bidders, the FDIC approved the offer of Flagstar Bank, a subsidiary of New York Community Bancorp. The following day the FDIC entered in a P&A agreement for "substantially all the deposits and certain loan portfolios" of Signature Bridge Bank with Flagstar Bank. Depositors of Signature Bridge Bank automatically became depositors of Flagstar Bank, with the exception of those related to the digital asset banking business, which were directly paid

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the possibility two define a purchase and assumption (P&A) solution for SVB, which was defined as "an unlikely but far preferable outcome to liquidation" (with the P&A, the FDIC seeks bids from qualified bidders in order to sell as many of the bank's assets and liabilities as possible). See: Gruenberg (2023b); and GAO (2023).

[39] For more details on the SRE, see Box 1.

[40] On March 10, after the announcement of SVB's failure, SBNY (which was already subject to media scrutiny also for its exposure to the digital asset market), lost 20 percent of its total deposits in a matter of hours, depleting its cash position and leaving it with a negative balance with the Federal Reserve as of close of business (Gruenberg, 2023b).

[41] Depositors protected with the SRE included also customers with very large amounts; the ten largest depositors at SVB held $13.3 billion overall. The regulators clarified that shareholders and certain unsecured debtholders were excluded from protection, senior management removed and that any losses following the SRE would have been recovered by a special assessment on banks, as required by law (Gruenberg, 2023b), and FDIC, 2023m).

[42] The bridge bank is used when the FDIC does not have enough time to effectively market the institution to a third party before failure; the bridge bank receives selected assets and liabilities for the following marketing and therefore can be considered as a tool to facilitate the P&A.

out by the FDIC for an amount of $4 billion.[43] At that time, the FDIC estimated the cost of the failure for the DIF at approximately $2.5 billion.[44]

The transaction included the purchase of about $38.4 billion of Signature Bridge Bank's assets while the former SBNY had a total of $110.4 billion assets as of 31 December 2022; loans for approximately $60 billion and securities for $27 billion remained in the receivership for later disposition by FDIC.[45] The FDIC received equity appreciation rights in the holding of the acquiring institution.[46] As for the assets remained in the receivership, on April 3 the FDIC announced the framework for marketing the loans;[47] on April 5 it announced retention of BlackRock as the advisor to assist the liquidation of securities (both of SNBY and SVB).

In the case of SVB, on March 20 the FDIC announced the extension of the bidding process in order to have additional time to explore all the options and achieve an optimal outcome with a maximized value. The FDIC also announced the possibility to present separate offers for SV Bridge Bank and its subsidiary Silicon Valley Private Bank. On March 26, after receiving 27 bids from 18 bidders, the FDIC approved the offer of First Citizens Bank & Trust Company, which assumed all deposits and loans of SV Bridge Bank, acquiring also the bank's private wealth management business. The transaction included the purchase of about $72 billion of SV Bridge Bank's assets (at a discount of $16.5 billion) while the former SVB had a total of $167 billion assets as of 10 March 2023; securities for approximately $90 billion and other assets remained in the receivership for later disposition by the FDIC. The FDIC received equity appreciation rights in First Citizens BancShares for $500 million. The agreement included a loss-share arrangement

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[43] On Saturday, 25 March, the FDIC notified those depositors that Flagstar had not assumed their deposits; FDIC indicated them to contact the acquiring institution, who served as FDIC's paying agent, to obtain their deposits by April 5, 2023. See: NYU (2023); FDIC (2023n); and Gruenberg (2023c).

[44] As with all the bank receiverships, the estimation of the loss is periodically adjusted with the ongoing of the receivership and the exact cost would be determined at the termination of it. See: NYU (2023); and Gruenberg (2023c).

[45] As of the mentioned date, deposits amounted to $88.6 billion. The transferred assets included loans of $12.9 billion purchased at a discount of $2.7 billion (Gruenberg, 2023b).

[46] On May 16, 2023, the FDIC received $392 million from the sale of the stock, which was received upon the FDIC exercising the rights noted above (FDIC, 2024a).

[47] By December 31, 2023, the FDIC had disposed of substantially all of these retained loans; see FDIC (2024a). On September 5 2023, the FDIC announced the start of a marketing process for the approximately $33 billion of commercial real estate (CRE) loans which were included in the portfolio; the final transaction was announced on December 20, 2023. See: FDIC (2023f); FDIC (2023g); FDIC (2023h); FDIC (2023i); FDIC (2023l); and Gruenberg (2023c).

for commercial loans. At that time, FDIC estimated the cost of the failure for the DIF at approximately $20 billion. [48]

Upon the failure of SVB on March 10, substantial deposit withdrawals started to impact on FRB, whose balance sheet amounted to approximately $230 billion as of March 2023. By the end of that day, deposit outflows of $25 billion (17% of total deposits) had occurred, imposing a call on the FR's credit lines. The situation even worsened the following week, after the failure of SB and the Systemic Risk Determination. On March 13, FRB experienced deposit outflows for approximately $40 billion in a single day. To restore confidence, on March 16, a consortium of 11 US primary banks provided $30 billion in funding to FRB through uninsured deposits. Such measure contributed to stabilize the level of deposits during the following week, giving the bank the opportunity to explore options for raising capital and restructuring its business.

On April 24, the publication of FRB first-quarter financial results, which reported deposit outflows of more than $100 billion since the end of 2022, replaced by more expensive sources of funding, triggered a negative market response and a resume of material deposit withdrawals. The latter exceeded $10 billion from April 26 to April 28. The FDIC and the CADFPI downgraded FRB to "problem bank" status on April 28. This undermined the bank's ability to access the "primary credit" discount window lending from the FR, and the residual possibilities to meet its liquidity needs.

On April 28 the FDIC launched a formal marketing process for FRB. 21 banks and 21 non-banks were invited to provide an official bid by 12.00 of April 30. The top 4 bidders out of a total of 12 joining the process were eventually involved in a second phase, in which they were requested to provide their best and final offers by 7 pm on April 30. This highly competitive bidding process "resulted in a transaction that clearly represented the least cost option to the DIF, was consistent with the least cost requirements of the FDIC Act and could be pursued upon the closure of the bank" (Gruenberg, 2023c).

On May 1, 2023, FRB was closed by the CADFPI, which also designated the FDIC as receiver. On the same day, the FDIC entered into a purchase and assumption agreement with JPMorgan Chase (JPMC), whereby all deposits, certain other liabilities and substantially all of the

[48] As of the mentioned date, deposits amounted to approximately $119 billion (Gruenberg, 2023b).

assets of FRB were acquired by JPMC for a cash payment of $10.6 billion.[49] The transaction was supported by a five-year loss sharing agreement between the FDIC and JPMC on most of the acquired loans,[50] as well as the provision by the FDIC of a $50 billion five-year fixed-term financing facility. As stipulated in the transaction, FRB's offices reopened on the same morning of May 1 as branches of JPMC and all depositors of FRB became depositors of JPMC. The resolution of FRB involved no systemic risk determination. The preliminarily estimates by the FDIC reported a cost to the DIF of $13 billion for the resolution of FRB.

5.2 The system-wide policy response

Along with the measures applied to the individual failed banks, on 12 March 2023 the US authorities launched a system-wide program to sustain the liquidity conditions of banks operating in the US, denominated "Bank Term Funding Program" (BTFP). This program allowed Federal Reserve Banks (FRBs) to provide loans with a maturity up to 1 year to eligible borrowers, including US insured depository institutions, against the par value of collateral eligible for purchase by FRBs in open market operations, with no haircuts applied.[51]

The BTFP, in place for a year since its launch, represented a significant relief as compared to standard central bank lending facilities,[52] mainly in terms of loan maturity and collateral valuation. As a benchmark, ordinary lending programs by the FR under the "discount window primary credit", envisage a maturity up to 90 days and value the collateral at its fair market value applying different haircuts according to its characteristics. The main purpose of the measure was to provide confidence to the market regarding the ability of the banking sector to repay deposits without incurring immediate losses on their balance sheets, mitigating the risk of broader deposits runs.

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[49] The perimeter included approximately $173 billion of loans and $30 billion of securities within FRB's assets, $92 billion of deposits (including $30 billion of large bank deposits) and $28 billion of Federal Home Loan Banks advances (JPMorgan Chase & Co,2023).

[50] The FDIC has provided an 80% loss share with respect to the substantial majority of the acquired loans (i.e. single family, residential and commercial loans).

[51] The Department of the Treasury, which posted $25 billion to protect FRBs from potential credit losses, supported the program (launched on March 12). The interest rate - equal to the one-year overnight index swap rate plus 10 basis points, fixed on the day the loan is granted - was set in order to be likely higher of the market rate banks payed on deposits. See Fed Board(2023a).

[52] In general, depository institutions have access to three types of discount window credit from their regional Federal Reserve Bank: primary credit, secondary credit and seasonal credit (Fed Board, 2024a).

To provide an approximate measure regarding the BFTP's use by the banks, at the end of February 2024, close to its expiration, the total outstanding amount of all advances was approximately $163 billion. The FR expects to suffer no losses from the program, although it encompassed also institutions, which subsequently failed, like FRB.

Concerns related to contagion and negative effects on the real economy were also behind the adoption of the SRE by the FDIC and the FR. In particular, the FR noted that the failure of the two banks would have led to additional turmoil in a deposit market; indeed, also many other banks relying on insured deposits were under pressure and other banks with similar clients had suffered stress following the deposit run at SVB. Similarly, the FDIC told the US GAO that deposit outflows and stress could have caused additional failures and reported that financial institutions were facing net outflows as customers were withdrawing funds or using existing credit lines; moreover, the FDIC was receiving reports of large withdrawals by uninsured depositors.

As of the broader economic effects, the FDIC and the FR reported that a large part of uninsured depositors at SVB and SBNY were small and medium-size businesses that, suffering losses or without having access to their funds, could have been unable to make payrolls and pay suppliers, with negative impacts on the US market and industrial operations. Moreover, the compliance with the LCReq could have produced an increase in lending costs and a contraction of lending from banks to businesses and households; similarly, the banks' rapid losses had caused uncertainty and loss of confidence of investors, restricting the inflow of private capital necessary to restore the banks' financial position and ease new lending. According to the FR, these credit contractions would have caused materially lower economic performance and materially higher unemployment.

Box No. 2: The systemic risk exception

The SRE is a waiver to the LCReq, and can be invoked when complying with the LCReq "would have serious adverse effects on economic conditions or financial stability" and the FIDC's action would "avoid or mitigate" such adverse effects. Under the SRE, the FDIC can choose the option which is not the one having the least cost, protecting uninsured depositors and creditors who otherwise might suffer losses under a least-cost method. Differently from the past, in order to use the SRE, an institution must first be placed into receivership.

The SRE can be used only under a specific process (FDIC, 2017; and GAO, 2023). The determination is adopted by the Secretary of the Treasury, in consultation with the US President, only after a written recommendation by a two-thirds majority of both the Board of Directors of the FDIC and the Board of Governors of the FR. The Secretary must notify Congress in writing of any SRE determination and document each determination; the GAO reviews any determination and then reports its findings to Congress. Moreover, the FDIC is required to recover any losses to the DIF resulting from the SRE by levying one or more emergency special assessments on banks.

The SRE was introduced by the Federal Deposit Insurance Corporation Improvement Act (FDICIA) in 1991. It was never used until the 2007-2009 subprime crisis, when it was invoked three times in two months at end-2008 (crisis of Wachovia Corporation, Temporary Liquidity Guarantee Program – TLGP – and crisis of Citigroup). In these cases, the proposed FDIC's actions never occurred or resulted in a positive net income to the FDIC or to the government as a whole.[53] In early 2009, the FDIC and the FR also made two other recommendations for the adoption of the SRE (Bank of America and Legacy Loan Program – LLP), neither of which resulted in a SRE determination.[54] The determination of the SRE had the intended effect of stabilization and prevention of the failure (FDIC, 2017); this happened also whit the sole recommendation as this could serve as a *de facto* determination (GAO, 2010).

Before the subprime crisis, the SRE was intended to apply to individual institutions only; the situation in 2008 led policymakers to reexamine the scope for an application system-wide and indeed they used it to justify two crisis programs (TLGP, and LLP) open to all banks, including the healthy ones.

GAO (2010) examined the use of the SRE and reported that the agencies (FDIC, FR, and Treasury) believed that FDICIA was unclear on how the SRE should be applied and could be interpreted in the sense that the SRE could be invoked when either the banking industry as a whole or just a single institution was in danger of causing the entire financial system to collapse, then making what they called a "generic systemic risk determination".[55] The GAO found some support for the agencies' positions but also that their interpretations were open to question and raised significant policy issues. Based also on the GAO recommendation, the DFA significantly narrowed the scope of the SRE, providing that an institution must first be placed into receivership

(as happened in the cases of SVB and SBNY), thus repealing the possibility that the SRE can be used to assist a troubled open bank and for broadly based programs (FDIC, 2017).

5.3 The impact of the resolution decisions on the Deposit Insurance Fund

As of 31 December 2023, the FDIC estimates that the total cost for the failure of SVB and SBNY to be $23.6 billion ($21.8 and $1.8 billion respectively), of which $20.4 billion attributable to the cost of covering uninsured deposits under the SRE.[56] As required by its statute, the FDIC recovers the $20.4 billion estimated loss from the use of the SRE by imposing a special fee (also called assessment), on the insured depository institutions (IDIs). On the contrary, the remaining estimated amount for the two banks ($3.2 billion), together with estimated losses for FRB ($16.7 billion), will impact the Deposit Insurance Fund (DIF), as well as the other failures managed in 2023, for a total of $20 billion.[57] This is the second highest annual loss in the FDIC's history after the loss in 2009 that was related to 140 failed banks.[58]

The FDIC issued a notice of proposed rulemaking for the special assessment on May 11, 2023 and the final rule on November 16, 2023. The estimated loss will be recovered over eight quarterly assessment periods, beginning with the first quarterly assessment of 2024 (i.e. from 1

[53] In the case of Wachovia, after the determination to use the SRE within the bid of Citigroup, Well Fargo made an offer that did not require any FDIC assistance. In the case of TLGP, the whole program resulted in positive net income. In the case of Citigroup, asked to terminate the planned assistance by the FDIC (giving compensation in the form of stock and warrants). See: FDIC (2017); and CRS (2023a).

[54] Bank of America asked to terminate the announced assistance by the FDIC package before the determination of the SRE; LLP never progressed beyond a pilot program. See For a review of the cases, see: FDIC (2017); CRS (2023a); and GAO (2010).

[55] According to the FDIC, the choice was based on two assumptions about bank-by-bank assistance: it would be ineffective, and it would be more costly to the FDIC than would the TLGP. See FDIC (2017).

[56] Out of the $20.4 billion, $19.2 billion concern SVB and $1.2 billion refer to SBNY. See FDIC (2024a).

[57] Five IDIs failed in 2023. In addition to SVB, SBNY an FRB, the following banks failed: Heartland Tri-State Bank Elkhart (closed in July 2023 and resolved through a P&A with Dream First Bank for a DIF estimated loss of $54.2 million) and Citizens Bank (closed in November, 2023 and resolved through a P&A with Iowa Trust & Savings Bank, for a DIF estimated loss of $14.8 million). See FDIC (2024a).

[58] The comparison is done in nominal values without considering inflation; moreover, the amounts of losses are estimation (FDIC,2024a).

January to 31 March and with an invoice payment of June 28, 2024).[59] The special assessment, whose base is the IDIs' estimated uninsured deposits, will be paid by banking organizations with at least $5 billion of total assets.[60] As a result of the losses related to the actions taken for the 2023 failures, the DIF balance decreased to $121.8 billion as of December 31, 2023 from a record high of $128.2 billion as of December 31, 2022.[61] This decline, coupled with the growth in insured deposits, caused a reduction of the reserve ratio from 1.25% as of end-2022 to 1.13% as of September 30, 2023, moving away from the statutory minimum requirement of 1.35%.[62] According to the FDIC, the DIF remains on track to meet the requirement by the deadline of September 30, 2028, though the precise timing is uncertain and depends on a number of factors.[63]

The large IDI failures also led in 2023 to a historical high level of $202.3 billion (from $39 million at end-2022) of assets managed by the FDIC in liquidation inventory. After the peak, following the activities to liquidate the assets (exercise and sale of equity appreciation rights, sale of loans and securities, etc.), the total book value of assets reached $84.6 billion at end-2023.

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[59] The FDIC has discretion in the design and timeframe for special assessments to cover the losses from the SRE; it is required to consider the types of entities benefiting from the action taken, economic conditions, the effects on the industry and such other factors deemed appropriate and relevant. The special assessment may change subject also to the periodically adjustments of the estimated loss; the FDIC has the authority to cease collection early, extend the special assessment collection period, or impose a final shortfall special assessment after both receiverships have been terminated. See: FDIC (2024a); Gruenberg (2023b); FDIC (2023o); and FDIC (2023p).

[60] The FDIC estimates that the special assessment will be paid by a total of 114 banking organizations and that the 95% of the comprehensive amount will be paid by banks with assets over $50 billion (FDIC,2024a).

[61] The $6.4 billion decrease is primarily due to the losses of associated with the 2023 failures and those on the sale of the DIF investment, offset by increased assessment and interest revenue (FDIC,2024a).

[62] The minimum requirement of 1.35% was established (raising the previous minimum of 1.15%) by the DFA in 2010 which included provisions aimed at strengthening the DIF after that its balance and reserve ratio became negative in 2009. The FDIC has also set a long-term reserve ratio target of 2%. Indeed, an analysis using historical fund losses and simulated income data from 1950 to 2010 showed that only a reserve ratio exceeding 2% before the onset of each of two crises (S&L, between 1980 and 1990, and subprime, in 2007-2009) would have sufficed to prevent the fund from becoming negative throughout both crises. See: FDIC (2017); FDIC (2024a); and FDIC (2024b).

[63] The DFA required to reach the new minimum by September 30, 2020. In September 2020, after that in June 2020 the reserve ratio declined below the minimum following extraordinary growth in insured deposits during the first and second quarters of 2020, the FDIC adopted a Restoration Plan (then amended in June 2022) to restore the minimum of 1.35% by September 30, 2028 (absent extraordinary circumstances). See: FDIC (2017); FDIC (2024a); and FDIC (2024b).

6. A comparison with other banking crises

In this paragraph, we wish to compare this episode with other crisis situations that occurred in the US and the EU. The objective is to highlight the commonalities and the differences in order to draw some lessons to improve both the regulatory framework and the supervisory action.

Long-short strategies, concentration of risks in one asset class, excessive reliance on short-term runnable deposits and large regulatory loopholes were among the main triggers of the GFC. It is a well-known story that the combination of a housing bubble and a credit boom that caused the large complex financial institutions (LCFI) to wipe credit risk out of their balance-sheet led to the doom-event.

The LCFI had taken a highly undercapitalized one-way bet on the housing market (Richardson et al., 2023) that led to the massive accumulation of systemic risk, shown by the dramatic growth in the global banking balance sheets recorded between 2004 and 2007. The financial crisis erupted in August 2007, when in the context of housing market crash off-balance sheet vehicles that had been set up by banks to manage complex structured credit securities ran into funding liquidity problems. Concerns about credit risks quickly spread as uncertainties intensified about the nature and extent of exposures of banks to such risk, which in turn fueled massive deposit runs and the sudden dry-up of the short-term interbank market. These escalating tensions culminated in the bankruptcy of Lehman Brothers in September 2008 (Trichet, 2010). Again, the accumulation of "regulation-free" risk in banks' balance sheets funded by short-term liabilities ended up in a dramatic showdown.

Richardson et al. (2023) highlight one main difference between the GFC and the March 2023 turmoil. In the GFC, the LCFIs made naked "bets" on seemingly "safe" assets tied to risky residential mortgages (i.e. subprime mortgages). After the burst of the real-estate bubble, losses on ABS portfolio emerged without any underlying capital or counterbalancing value. Conversely, in the 2023 episode of banking stress, the banks' investments in long-term securities were theoretically "hedged" against the deposit franchise's change in value due to interest rate movements. In the 2023 banking turmoil a large spike in interest rates led to large losses on Treasuries and mortgage backed securities . While the losses triggered on securities by the rise in interest rates should have been offset by increases in the value of a bank's deposit franchise, this is only true if the deposits stay within the bank. Unfortunately, the sudden deposit run which took place led to the materialization of the underlying risk.

Moving back into history, at least other two major episodes of banking crisis took place in the US system: the crisis of Saving and Loans industry (S&Ls hereinafter) in the 1970s and the 1980s and the failure of Continental Illinois in 1984. These episodes share one common trait with the 2023 mid-sized banks' failures. The S&L institutions played a pivotal role in the US banking system between the 1940s and the 1990s, as their institutional mandate was to provide residential mortgage finance for home buyers. Regulation imposed them to originate fixed-rate mortgages only, which were mostly funded by short-term deposits; moreover, S&Ls were not allowed to issue checking accounts. S&Ls were borrowing short and lending long, a 2023 midsized banks-like strategy. At the same time, it shall be noted that such strategy was a consequence of the legal bindings to which the S&Ls were subject in the 1980s, whereas for SVB & others it was a choice.

Problems for the S&Ls started in the early 1970s, when the sudden rise in interest rates triggered the loss in value of fixed-rate mortgages, the only assets they could originate, and a generalized deposit outflows towards better performing financial instruments (although no episodes of massive runs took place, as the S&Ls deposit base was for more than 90 per cent insured). At the same time, regulatory standards for S&Ls were quite lax and did not provide for mark-to-market accounting, thus letting S&Ls appearing healthier than the they actually were. Such circumstance revealed crucial to delay any regulatory interventions, which took place only at the onset of the 1980s. In sum, the mix of long-short strategy, lax regulatory standards which did not provide for mark-to-market accounting and the centrality of interest rate risk were key factors that grounded the S&Ls crisis.

Unlike for SVB and other banks failed in 2023, the S&L's deposits were almost entirely insured and losses in the depositor base were not triggered by a customers' loss in confidence. Rather, deposits started to run out of the S&Ls for pure profit reasons, as the financial innovation which took place in the early 1970s attracted a large number of S&Ls depositors. Moreover, deposits "run" did not arguably lead to the S&Ls crisis, which in turn was not a short-lived episode. More simply, the rise in interest rates started in the 1980s led the S&Ls business model – based on fixed-rate loans and low-cost deposits – to be gradually unsustainable.

Prominent short-term funding and assets concentration were at the roots of the failure of Continental Illinois, the bank for which the "too-big-to-fail" notation was used for the first time (Richardson et al., 2023). This bank was specialized in loans to the energy and oil sector and to developing countries, and had a very peculiar funding structure for those times, mainly relying on short-term wholesale money markets and with limited presence of retail depositors. Amid the

failure of one of its biggest borrowers in the context of the 1981 oil crisis and the renegotiation of its syndicated loan exposure to Mexico, the bank experienced relevant losses. In this context, Continental was quickly shut out of its usual sources of funding in the domestic and Eurodollar interbank markets, described by the FDIC as a high-speed electronic bank run (Richardson et al., 2023).

Two main differences stand between this episode and the March 2023 turmoil. On the one hand, Continental underwent an idiosyncratic crisis, which was in turn triggered by its excessive asset concentration towards few big borrowers, whereas the rise in interest rates grounding the 2023 crisis took place in the context of large-scale macroeconomic events. On the other hand, Continental's deposit base was negligible and the liquidity strain borne in the wholesale market.

In the GFC and Continental case, the core of public intervention consisted in either direct or indirect financial support. The Troubled Asset Relief Program (TARP), envisaging a number of loan support and capital injections, was enacted on October 3, 2008 to restore confidence after the Lehman collapse. Similarly, emergency funding and a universal guarantee to depositors and creditors (akin to the SRE activated for SVB and SBNY) were deployed for Continental. Conversely, S&Ls did not benefit from public financial support, but were rather targeted by ad-hoc changes in regulation aimed, on the one hand, at introducing some degree of flexibility in their business model by allowing the origination of adjustable rate mortgages (ARM) and, on the other hand, at providing incentives to customers to retain deposits.

In the last decade, the EU banking sector has been shaken by a number of failures, also involving significant institutions: the Spanish Banco Popular, the two Italian Banca Popolare di Vicenza and Veneto Banca (the so called "Venetian banks") and the European subsidiaries of the Russian ABLV (in Lithuania) and Sberbank (in Austria, Croatia and Slovenia).

Unlike the US cases, not many similarities can be found with the March 2023 turmoil. In the cases of Spanish and Italian banks, the crisis was the final showdown of long-lasting weaknesses mainly based on the deterioration of credit portfolio and aggressive commercial policies. Both ABLV and Sberbank, conversely, were driven to failure by deposit runs triggered by international sanctions imposed to Russia. Also regulation played a totally different role, as no regulatory loopholes or lax standards were at the ground of these episodes. Moreover, the EU resolution framework and the national liquidation regimes allowed local authorities to manage the crisis without major public interventions. Banco Popular and the Croatian and Slovenian entities of Sberbank were resolved through the sale of assets and liabilities to another player (and the Spanish

bank also undertook the bail-in of equity and subordinated debt). The other banks were liquidated under national insolvency regimes, mainly consisting in the reimbursement of insured deposits by the Lithuanian deposit guarantee scheme for ABLV and a capital injection of the Italian State to support the sale of remaining good assets of the "Venetian banks" to another institution in the context of a liquidation procedure.

The history of US crises shows how the mix of unwise investment strategies and aggressive funding policies in terms of both concentration and reference time horizon could lead to disruptive events. Although the main responsibility of such business strategies stays on poor management practices, the role of authorities in terms of excessively lax regulation and poor ongoing supervision cannot be underestimated. Although it is undoubtedly true that no regulatory tools could provide a total shield against crises, it shall be recognized that the action of authorities, both ex-ant and ex-post, could help minimizing adverse effects to the financial system as a whole.

In this regard, the EU experience is emblematic to some extent. The failure of a number of banks (in some cases more than one bank at the same time) did not lead to the materialization of systemic risk, nor major spill-over effects took place. To this extent, merits could be found in the stringent ongoing supervision which, despite the well-known and long-lasting deterioration of some of the involved banks (i.e. Banco Popular and the "Venetian banks), was able to accompany distressed intermediaries towards an orderly resolution. In other words, the ex-ante supervision, even if did not prevent bank failures, helped to contain ex-post burden at both micro and macro level.

However, it should be recognized that the causes underlying 2023 turmoil have never been observed before, and that the ex-post reaction of US authorities – including the adoption of extraordinary measures such as the SRE - had merits in containing spill-over effects. The recent US experience could therefore pave the ground for further reflection also in the EU on how to take stock of the lessons stemming from the recent crisis, in order to enhance the crisis management framework and improve the ability of EU institutions to react promptly to eventual future stress events.

7. Are there lessons for the prudential and crisis management frameworks in the EU?

7.1 The US and the EU compared

The US authorities responded to the 2023 banking failures, exploiting to the largest extent possible the degrees of flexibility embedded in their regulatory framework, also through derogations from the 'normal' rules and procedures for crisis management. Furthermore, they have recognized the shortcomings of their previous approaches to prudential supervision and regulation on mid-sized banks. In this respect, tougher rules and practices, more proportionate to the risks potentially posed by this category of banks, have been put again on the agenda.

The US events have stressed the point that authorities should not overlook the circumstance that even banks not labelled as systemically important may enter a crisis situation potentially leading to wide repercussions on the banking sector, and in particular on the confidence of depositors belonging to other banks with similar dimension and business model. In such a case, reputational risks for regulators can increase unexpectedly. For these reasons, these banks should be supervised through adequate and proportionate approaches, including an efficient framework for crisis management (Trapanese, 2022).

In this context, we should recognize the points of strength of the EU situation as compared with the US, which involve the behaviour of the EU banks and the approaches to regulation and supervision by the EU authorities over the years.

According to Enria (2023), the EU banks have a different business model as compared to the failed US banks, like SVB, with a more diversified customer base on both sides of the balance sheet. They are not significantly exposed to an extreme interest rate risk and do not rely upon a concentrated, uninsured deposit base. Even during the market turmoil of spring 2023, the liability side of the EU significant banks remained stable. Moreover, the decision of the EU authorities to apply all the post-GFC standards to all EU banks, irrespective of their size, although with degrees of proportionality, implies that the EU banks are always subject to liquidity - LCR and NSFR – and capital requirements.[64] Finally, the EU supervisory authorities increased their focus on the

[64] If we compare the capital ratios of the euro-area significant banks with those of the US largest banks, we find that the capital figures for the EU global systemically important banks are the same as their US peers (or even a bit lighter for the EU banks). The situation changes if we consider smaller banks. In other words, the US authorities have been more demanding in terms of capital, buffers, and stress test add-ons, for the largest banks and much less for the smaller ones. This attitude has had a bearing on the 2023 spring crises. See Enria (2023).

interest rate and credit spread risks as early as the second half of 2021, when the first signs of inflationary pressure emerged and the monetary policy conditions started to normalize. In 2022, these risks became a supervisory priority, along with liquidity and funding risks.[65]

7.2 Implications for prudential regulation

Following the US events, there has been a renewed focus on the negative financial stability implications arising in the case the domestic implementation of the post-GFC rules follows divergent patterns across jurisdictions in a number of key prudential requirements. In this respect, a key lesson from the 2023 US events is that the international prudential standards need a full and consistent implementation across jurisdictions.

Notwithstanding the Basel III framework has proved to be effective in enhancing banks' resilience, the major triggers of the US banking turmoil suggest the existence of some areas that are worth investigating further, including (but not limited to) liquidity risk and its interplay with interest rate risk through the maturity mismatch mechanism. These areas deserving further consideration in the near future have been identified by the BCBS itself (see Box No. 1). Targeted reviews in the EU prudential framework - after the completion of this work by the BCBS - cannot therefore be excluded at this stage, and in some case may be advisable.

The US case should draw the attention on the importance of coping with the risk of excessive maturity mismatch. Even highlighting that the US banks involved were not subject to LCR and NSFR, a key question is to what extent the current regulatory framework is able to capture this risk and its implications for liquidity and interest rate risks. In this respect, it could be useful to introduce explicit and more articulated limits to the maturity mismatch, which might help in preventing the side effect of abrupt interest rate changes, as in the SVB case (Angelini, 2023; and Signorini, 2023).

As for the interest rate risk, strengthening the second pillar discipline could allow authorities to introduce requirements calibrated with respect to different circumstances and to the specific risk exposure of the single intermediaries (Signorini, 2023). In addition, banks should reassess the

[65] When the US banking turmoil emerged, more than half of the EU banks' existing buffers of liquid assets were made of cash and central bank reserves, which sensibly mitigated the risk of mark-to-market losses when liquidity needs arose. In the same period, the relevant EU banking data indicated that those banks that had experienced some deposit outflows appeared to have succeeded in maintaining their levels of excess liquidity, by issuing debt securities and reducing interbank lending, and only to a lesser extent by liquidating securities. See Enria (2023).

reliability of historical estimates, exploring to what extent the current environment may have changed customers' behaviour, and adopt discretionary overrides when necessary.

As for liquidity risk, the US banking turmoil has highlighted the utility of the LCR in warning intermediaries and supervisors about the approaching of episodes of financial distress. At the same time, the US experience also suggests the need of exploring possible revisions of the calibration of deposit run-off rates embedded in the LCR (and also in the NSFR) in order to reflect the increased speed of deposit withdrawals. For this purpose, also other elements should be taken into account, notably the degree of concentration of deposits and the deposit insurance coverage.

To what extent all these elements – especially the most idiosyncratic ones – should be accounted for in a Pillar 1 requirement is something that is still to be assessed. Finally, the case of SVB also shows the importance of banks being ready to post collateral to obtain emergency liquidity assistance from the central bank. In this respect, it could be assessed the introduction of a minimum level of bank assets to be used for supporting interventions by central banks (King, 2023; and Angelini, 2023).

7.3 Possible improvements in the EU crisis management framework

A large part of the reflections motivated by the 2023 US banking turmoil has focused the EU framework for crisis management, given the specificities of the EU institutional architecture and legislation (See Box No. 3, for the lessons learnt at the FSB level).

In the EU, a very complex institutional system has emerged since the GFC, relying upon several layers of responsible authorities, applicable rules and standards, differentiated at the national, and EU levels. While the Banking Recovery and Resolution Directive (BRRD) and the Single Resolution Mechanism (SRM) have provided the fundamentals for a harmonized system for crisis management and resolution, at least for the largest and systemic EU banks, the EU framework still misses an efficient and integrated system for the management of crises of small and medium-sized banks.[66]

[66] During the recent years, some EU mid-sized banks have exited the market according to the different features of the national regimes. If we limit the analysis to the crucial issue of the funds available in a crisis, we find the same amount of funds in the EU (summing up the Single Resolution Fund and the national deposit guarantee schemes) and in the US (through the FDIC). The point is that it is very difficult in the banking union to deploy such a funding to ensure a smooth management of a banking crisis, because of the variety of regimes at the national level and of different rules of engagement of the national DGS. For a detailed examination of these issues, see Majnoni et al. (2021).

As for the crisis management framework, more work is needed in the EU to move towards a more integrated system, also embedding a greater level of flexibility, in order to allow authorities to have a more comprehensive toolkit. In this respect, the EU framework still misses a financial stability facility/exemption, aimed at overcoming the rigidities of the framework in the case exceptional circumstances threaten the EU financial stability.[67] This feature, coupled with the absence of a true European deposit insurance system, makes the EU crisis management framework still incomplete. The decision of the US authorities to use the SRE for two of the three banks failed has reopened the debate about the optimal level of deposit coverage and the function of DGS within the overall framework to ensure financial stability.[68]

The recent proposal adopted by the EU Commission to reform some features of the current EU framework for crisis management and deposit insurance includes amendments to facilitate the management of the crises affecting small and mid-sized banks (EU Commission, 2023). At the national level, the 2023 US banking failures led the UK authorities to question about the adequacy of their current framework to address more efficiently smaller banks' crises (see Box No. 4). In the proposal of the EU Commission, the deposit guarantee systems (DGS) are allowed to carry out interventions to prevent the bank's default (preventive measures), and interventions different from deposits payouts (alternative measures), under a single-tier depositor hierarchy, aimed at facilitating the Least Cost Test.[69]

In this way, a greater use of business transfer strategies in liquidation and in resolution becomes feasible, thus increasing the DGS incentives to adopt crisis management strategies having the objective to minimize the cost of the crises for all the stakeholders.[70] Moreover, the

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[67] An additional element of rigidity is the opposition to the use of public resources confirmed by the new proposal. See Angelini (2023).

[68] In the US, there is a de facto 100 per cent deposit insurance coverage, since no depositor has taken a loss at least since the GFC. Authorities often opt to protect all deposits, even in the absence of a legal obligation. For example, in 2008, the FDIC guaranteed all fixed liabilities of US banks; and in 2023 happened the same, when FDIC protected all deposits of SVB and SBNY, prior to finding a buyer for these two banks.

[69] These alternative interventions are incentivized also through the removal of the preferential treatment accorded to deposits that are protected in the insolvency hierarchy (super-priority), which should be replaced by a uniform treatment of all deposits (general depositor preference single tier) in the proposal by the Commission. See Angelini (2023).

[70] These alternative interventions are an essential element of the crisis management framework in the US, and allow to avoid piecemeal liquidations, and their negative consequences, in terms of impact on public confidence, creditors positions, and credit relationships.

Commission proposal lays down the conditions to provide the funding means needed to overcome the potential gap in the availability of bail-inable liabilities different from deposits before the intervention of the Single Resolution Fund, where needed.

The objective to minimize the cost of a banking crisis could be pursued also by an increase in the level of protection of deposits. This issue is not included in the recent proposal for reforming the EU crisis management framework. Deposit insurance is a traditional tool to address bank runs, at least since the 1930s. The theoretical and empirical economic literature underlines that DGS fosters confidence and stability in the banking system, while diminishing the incentive of depositors to monitor their banks, thus incentivizing banks to take on higher risk (moral hazard).[71] To contain moral hazard and limit the potential fiscal costs of a bank's failure, all countries have capped the value of insured deposits. Traditionally, this has been achieved by limiting the coverage to a certain amount per individual, thus focusing the protection on the relatively small, dispersed and unsophisticated investors.[72]

The 2023 US banks' failures have drawn the attention on the potentially destabilizing role of uninsured deposits in the modern banking systems, given the increased speed of withdrawals allowed by the technological progress, and experienced during the crises. These events have revealed the special vulnerability of banks to runs by small and medium enterprises that rely on uninsured bank deposits to meet their business and other high-frequency operational needs. Like other runnable liabilities, they risk creating contagion across the financial system. Despite the high level of the US deposit protection threshold, on average in 2022, nearly 45 per cent of the value of deposits was uninsured and runnable.[73] While concentrated in less than 1 per cent of accounts, this

[71] This moral hazard problem has been analysed – among others – by Karas et al. (2013), Ioannidou and Penas (2010), and Dewatripont and Tirole (1994). While there is a huge amount of economic literature underling the role of deposit insurance as stabilizer in times of crisis, there are other work suggesting that deposit insurance can undermine financial stability by increasing the build-up of risk in the financial system. For example, Anginer et al (2014) find evidence that the deposit insurance increased bank fragility in the run-up to the GFC, while reducing risks during the crisis itself.

[72] In the EU, the current level of deposits' protection was established by the reforms finalised after the GFC and the euro-area debt crisis, and is harmonised up to 100.000 euro, per depositor per bank. Other European countries, such as Switzerland and the UK, have a similar limit of coverage. In the US, the current threshold is $ 250.000 and appears to be the highest among the advanced economies. In Japan, there is an unlimited coverage for settlements and business transaction accounts. In Norway, the threshold is about $ 200.000; in Australia, it is about A$ 250.000. Canada and several Asian countries have lower coverage. For these data, see NYU (2023).

[73] At the end of 2022, these uninsured deposits constituted the largest component ($ 7.5 trillion) of the $ 19.6 trillion total runnable liabilities of the US financial system .

uninsured proportion was the highest since the 1960s, and well above the range that prevailed in the 1980-2000 period. In the light of these features, the FDIC has presented and discussed some proposals to reform the US deposit insurance system.[74]

In the EU, under the current rules, the vast majority of the eligible depositors are completely protected by deposit insurance.[75] However, on average less than 40 per cent of the EU deposit balances are insured; this indicates that EU banks are significantly exposed to the risk of deposit runs, coming from the holders of relatively few accounts with very large or uncovered balances (ESRB, 2024). In this context, there are signs of a new discussion to extend the scope of deposit insurance to all deposits, regardless of their amount (IADI, 2021; IADI, 2023a; and IADI 2023b).

[74] In May 2023, the FDIC issued a consultative report containing some options for deposit insurance reform. These options are as follows. A) Maintain limited coverage. To make the current cap binding, it would simplify coverage and end deposit brokering by introducing an FDIC deposit registry. Limits would apply per person only. B) Targeted increase of coverage. This option would increase the coverage cap for the transactions accounts of small and medium-sized enterprises. C) 100 per cent coverage. It covers all deposits at insured depositories. D) Deposit insurance would be replaced, by altering the practices of the lender of last resort by the FED. Short-term liabilities, including deposits, must be backed by cash or by a claim on reserves at the central bank. The lender of last resort function guarantees the liquidity of all short-term liabilities at all times. See FDIC (2023b).

[75] A recent report of the EBA outlines that there is no need to change the current coverage level. This conclusion is based on the findings that any of the assessed potential increases in coverage, while being costly, would have positive but limited impact on financial stability and consumer protection, and a somewhat negative impact on moral hazard. The same report says that It should nonetheless be noted that coverage level is one of a number of important elements of the crisis management and deposit insurance framework and the assessment of the adequacy of each of these elements in this context requires a holistic assessment which is beyond the scope of this report.

Box No. 3: Lessons learnt for resolution

The genesis of the crises and the policy measures adopted to manage the failures of Silicon Valley Bank (SVB), Signature Bank (SB) and First Republic Bank (FRB) represent a concrete basis for possible improvements of bank resolution frameworks.

Although none of the banks in question were formally designated as systematically important institutions, their failures proved to produce a contagion effect, driven by business similarities, geographic or sectoral concentration. At international level, most of the current resolution standards focus on institutions considered systemic or critical in failure. In light of the 2023 US cases, the concept of systemic importance should be reconsidered on the basis of a broader set of criteria, potentially including the amount and concentration of uninsured deposits on top of the ones mentioned above (FSB, 2023b).

A key role in supporting the resolution of the three banks has been played by the Deposit Insurance Fund (DIF), administrated by the Federal Deposit Insurance Corporation (FDIC) on the basis of the least-cost requirement in ordinary circumstances. The use of the DIF contributed to managing the financial situation following the closures and provided capital support for the implementation of the resolution measures. In two of the three resolution cases concerned, the FDIC also invoked a systemic risk exception to waive the least cost requirement to the DIF and limit further spill-over effects on the banking system. This should encourage further reflections on the role of deposit insurance schemes in resolution and the appropriate design of deposit insurance frameworks.

An additional measure that would have helped to absorb losses and mitigate contagion risks in in the cases under review is the ex-ante imposition of long-term debt requirements on banks other than G-SIBs. The presence of a layer of stable liabilities bearing losses before deposits reduces the probabilities of bank runs by uninsured depositors. Moreover, it helps to diversify the banks' sources of funding while not triggering additional liquidity pressures in case of stress.

The prominence of liquidity issues in crisis governance has been even remarked by the US cases. The widespread use of mobile banking and social media has further increased the speed of bank runs. In the first place, this reduces the time available for relevant authorities to react and prepare for a possible resolution. It also stresses the importance of establishing adequate public liquidity backstop arrangements in the run up to and during resolution, which banks should be operationally ready to access. In this perspective, consideration should also be given to allowing a certain degree of flexibility to the authorities in determining the necessity and characteristics of emergency public funding measures to be adopted for a specific crisis case.

Finally, in connection with the previous issue, the US failures have underlined the importance of an effective bank resolution planning. Currently, the American regulation requires large regional banks to periodically submit resolution plans to the FDIC that include essential information supporting their resolution. While Signature Bank had not filed its first resolution plan at the time

of failure, both Silicon Valley Bank and First Republic Bank had included useful but still not exhaustive information (Gruenberg, 2023a; and GAO 2023). Considering that their resolution procedures were ultimately based on business disposals under tight time constraints, it would have been beneficial to have information on the banks' ability to rapidly set up and populate a Virtual Data Room with the data needed for a due diligence process. Communication procedures towards internal and external stakeholders and arrangements to maintain operational continuity in resolution proved to be other key information that would have enhanced the resolution management. A proposal for more structured resolution planning requirements, taking into account also the evidences above, has become part of the FDIC work plan.

There are pros and cons of such a move. First, an extension would minimize the cost of banking crisis for all the stakeholders involved. However, as deposit insurance funds are relatively small, covering on average less than 1 per cent of the insured deposits, this would leave the taxpayers and the surviving banks to pay the bill of an increased risk taking. Specifically, a significant extension of the deposit coverage in the EU could increase the opposition to creating a common deposit insurance scheme in the euro area as it would increase the concerns about the socialization of losses due to excessive risk taking.

Some authors indicate that extending deposit insurance to all deposits will further increase the volume of large deposits on banks' balance sheet, and removing any incentives of their holders to monitor the risk profile of their banks (Heider et al., 2023). However, as to the moral hazard implications, it is fair to say that - given the high fixed costs of monitoring banks - only the largest depositors are in a condition to do this job efficiently. This means that – in marginal terms – protecting more depositors to lower their incentives to run does not necessarily aggravate moral hazard severely . In this respect, a case could be done to make a targeted extension of deposit protection for accounts of non-financial firms used strictly for transactional purposes, as opposed to investment decisions, such as accounts dedicated to pay wages, combined with additional measures to limit moral hazard, including differentiated and more risk-based insurance premiums.

Box No. 4: The UK proposal to extend the resolution framework to smaller banks

Following the SVB failure, the Bank of England (BoE, the U.K. resolution authority) resolved its U.K. subsidiary through capital write-down and sale of business to a private buyer. Although, under the current regulatory framework, SVB UK's small size subsidiary would have been subject to ordinary insolvency proceedings, the U.K. authorities opted for resolution, given SVB's significant role in certain market segments. This case led UK authorities to question about the adequacy of the current framework to deal with smaller banks' crisis, whose resolution might be necessary in the public interest despite the lack of internal capital resources to fund resolution (i.e. bail-inable liabilities).

In January 2024, the U.K. Treasury launched a public consultation on the proposal to extend resolution to smaller banks in the presence of public interest. The procedure would be financed by the Financial Services Compensation Scheme (FSCS), the U.K. Depositors' Protection Fund, through ex-post contributions from the banking system, in line with what is already provided for the repayment of protected deposits. The U.K. Treasury notes that the application of a MREL requirement would impose excessive costs on small banks, given their difficulties in accessing wholesale capital markets; it would also be less costly for the banking system as a whole to recapitalize small banks rather than imposing MREL. The assessment of public interest would be in charge to the BoE. In order to avoid the risk of writing down uninsured deposits, a lower minimum bail-in threshold would be imposed. Finally, the application of the least-cost principle is not envisaged.

The U.K. Treasury's proposal has points of contact with the proposed reform of the crisis management and deposit insurance framework (CMDI) under discussion at the European level, which also contemplates the extension of DGS funding to interventions aimed at preserving business continuity if there is a public interest and the risks for depositors and burdens for taxpayers are minimized. There are few differences: i) the wide discretion recognized to the BoE in assessing the public interest; ii) the non-application of the least-cost principle.

8 Conclusions

The 2023 US banking events have showed that authorities should not overlook the circumstance that even banks not labelled as systemically important may enter a crisis situation potentially leading to wide repercussions on the banking sector, and in particular on the confidence of depositors belonging to other banks of similar dimension and/or business model. For these reasons, these banks should be supervised through adequate and proportionate approaches, including an efficient framework for crisis management.

The US banking turmoil suggests the existence of some open issues concerning the Basel III prudential framework that are worth investigating further, including (but not limited to) liquidity risks. In this respect, the BCBS has already identified some regulatory areas deserving further attention; corresponding targeted reviews also in the EU prudential framework in the near future cannot be excluded.

The EU framework for crisis management still misses a financial stability facility/exemption, aimed at overcoming the rigidities of the framework in the case exceptional circumstances threaten the EU financial stability. This feature, coupled with the absence of a true European deposit insurance system, makes the EU crisis management framework still incomplete. The objective to minimize the cost of a banking crisis could be pursued also by an increase in the level of protection of deposits.

However, the role of deposit insurance cannot be examined in isolation from other measures to limit bank runs and make the financial system safer. Since systemic risk extends beyond cases of financial distress originating in deposit markets, there is a need to reaffirm the importance of a holistic approach to bank stability, including deposit insurance and prudential and resolution policies.

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