

## SHALL WE RECONSIDER BANKING REGULATIONS?

*Some lessons drawn from the failure of Silicon Valley Bank and Credit Suisse*

*Katalin Mérő<sup>1</sup>*

### ABSTRACT

The paper analyses the lessons related to banking regulations to be drawn from two banking failures in March 2023, the bankruptcies of Silicon Valley Bank and Credit Suisse. The two failures have questioned whether the regulatory system established following the 2008 crisis can guarantee the stability of the banking sector. The paper analyses four areas of regulations that have come to the fore linked to the two cases. They are the issue of applying the principle of “too-big-to-fail”, and the regulations related to capital structure, banking book interest rate risk and liquidity risk. It is true for all four issues that the currently valid rules are not sufficient to guarantee stability and proper crisis management if banks have to face crises never encountered before. Banking regulations providing financial stability should strive to adopt a new approach instead of further hardening the current rules. A radical reduction of leverage or the introduction of central bank digital currency could become examples of such a new approach.

*JEL codes:* G21, G28

*Keywords:* banking regulation, bank crisis management, Silicon Valley Bank, Credit Suisse

### 1 INTRODUCTION

The bankruptcies of two banks shocked the financial markets of the world in March 2023. Firstly, deposit holders had a run on Silicon Valley Bank, the 16th largest in the USA, on 9 March. A week later it came to light the second largest Swiss bank, Credit Suisse had failed. Because of the two bankruptcies the question arises whether bank regulations basically reformed after the global financial crisis in 2008 are able to ensure banking stability. The objective of this paper is to take regulatory issues and the questions revealed by the two bankruptcies one

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<sup>1</sup> *Katalin Mérő* associate professor, Budapest University of Economics, Faculty of Finance and Accounting, Department of Finance. E-mail: .

by one and, reflecting to them, to try and draw lessons on the (non)suitability of current banking regulations.

In 2013, just 10 years ago an influential book was published by *Anat Admati* and *Martin Hellwig* “*The Bankers’ New Clothes*” (Admati–Hellwig, 2013). The title clearly refers to the well-known story by Andersen, *The Emperor’s New Clothes*. In the story, two swindlers posing as weavers make everybody believe they have a magnificent fabric, but it is invisible to those who are stupid or incompetent. Naturally, nobody wants to acknowledge incompetence, so they all praise the beauty of the non-existent fabric, including the emperor himself who has ordered a suit to be made from it. The situation only changes when a little boy blurts out that the emperor is naked. Admati and Hellwig believe that banks can successfully lobby for regulations advantageous to them because their operations are mystical for outsiders. Almost everybody accepts banks are special, so banking regulations are necessarily so complex that only few people can comprehend or see through them. They will not say the obvious, i.e., banking regulations allow taking excessively high risks, which serves the banks’ rather than society’ interests.

According to Admati and Hellwig, the reforms in banking regulations implemented following the 2008 global financial crisis are a far cry from what would be necessary to achieve the stability of the financial system. The new system of banking regulations is of a rather high volume, very much detailed and complex, so it is not sufficiently transparent even for experts. Still, if one looks at it in-depth, Admati and Hellwig think the problem simply is that banks operate with too much leverage, i.e., their capital is too little compared to the risks assumed. The authors believe 30 percent of total assets (not risk weighted) would be sufficient so that potential losses by the banks could be covered by shareholders’ investments. Of that, 20 percent would be mandatory capital requirement while another 10 percent would operate like the current capital conservation buffer<sup>2</sup>. Such a change could not only enhance the banks’ loss-absorbing capacity, but it could also reduce moral hazard driving excessive risk-taking by transferring a bigger portion of losses to the shareholders.

At the renewal of banking regulations following the 2008 crisis another path was opted for. A part of the logic of the earlier banking regulations striving to make the banking system operating with high leverage more resilient to risks was not given up. Within that, however, both the principles and techniques of the regulations have undergone major changes. The so termed Basel III system includes the

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2 In addition to the mandatory capital requirement, banks should set aside a 2.5-percent capital conservation buffer from their profits. In loss-making times, the buffer could be used, i.e., the level of capital could be reduced while the bank could still meet its capital adequacy requirement.

new prudential rules supplemented with a revised framework system on bank resolution. The changes were manifold and of high volume. According to *Borio-Farag-Tarashev* (2020), they can only be compared to the regulatory measures following the 1929-33 Great Depression by their scale. The main idea of the renewal of banking regulations is to strengthen stability and resilience to shock; to make regulators consider exposure to systemic risk side by side with individual risks and, to that effect, to supplement the earlier micro-prudential regulations with macro-prudential elements, as well as to stop applying the principle of<sup>3</sup> “too-big-to-fail” (TBTF) (*Borio-Farag-Tarashev, 2020; Mérő, 2012; Móra, 2019*).

The new rules seemed to be satisfactory to ensure the stability of the banks and banking systems for a little more than a decade after the crisis. When the Basel Committee evaluated the new Basel III rules in 2021 in the light of the financial shock caused by the Covid pandemic (BCBS 2021), the main finding was the Basel reforms had reached their goal, they had solidified the resistance of the banking system to shocks. On the other hand, the Basel Committee emphasised that regulatory facilitation by regulators and support by central banks and governments during the Covid period had significantly dampened the shocks on banks, so analysing their resilience to shock was quite difficult. The Basel Committee published its first comprehensive impact analysis of Basel III rules in December 2022 (BCBS 2022). The report found that the banks’ capital and liquidity had become stronger in the period following the implementation of Basel III, systemic risks had been reduced and fears of the new rules reducing the banks’ loan supplies had not materialised. All that time Admati (2016) continued to argue the comprehensive regulatory reform implemented under Basel III was but a missed opportunity to establish a stable, well-capitalised banking system that could resist crises.

March 2023 was a turning point in the assessment of the appropriateness of the banking regulations. A classic run started on banks in the United States on 9 March. In a single day, deposit holders of Silicon Valley Bank withdrew USD 42 billion worth of bank deposits from the sixteenth largest US bank causing it to fail. Two days later deposit holders had a run-on Signature Bank, another US bank of a similar business model, then authorities had it closed down. The unsecured depositors of both banks received full compensation and the authorities declared to act in the same way if other banks would get into difficulties. A few days later Credit Suisse, which had been involved in numerous scandals for years, found itself in a state of bankruptcy because of a crisis of distrust. Credit Suisse

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3 The TBTF principle says that the failures of large banks would jeopardize trust in the banking system and the operational safety of the financial system to such an extent that states will save them using taxpayers’ money.

was the second largest bank in Switzerland, which belonged among the largest banks globally. To manage the crisis, the UBS, the largest Swiss bank bought it up. The two bankruptcies warn it is possible that the system of banking regulations set up after 2008 has not given birth to a properly stable, highly stress resistant banking system. In the paper, the author is going to analyse the lessons drawn from the crisis of Silicon Valley Bank and Credit Suisse regarding bank regulations. She is seeking an answer to the question whether the regulations have some inherent faults or anomalies questioning the current regulatory system.

The paper is structured as follows: Part two is a summary of the two bankruptcies. Next, in part three, the regulatory anomalies revealed with respect to the two bankruptcies and their lessons are analysed. Firstly, the lessons drawn from an issue of regulatory policy, the persistence of the TBTF principle are summed up followed by pointing out the dysfunctional operation of three specific regulatory components during the crisis. They are the rules on capital structure, the regulation on banking book interest rate risk and the liquidity rules. The last part includes the lessons drawn from the cases referring to the initial question of whether a system operating with high leverage can be stable.

## 2 THE FAILURE OF SILICON VALLEY BANK AND CREDIT SUISSE

The time passed since the collapse of the two banks has been too short to present and assess their story systematically. The events and the banking risks behind them can mainly be pieced together from news items, newspaper articles and bank reports. Still, some quick comprehensive assessments are available now, a month after the events (*Danielsson–Goodhart, 2023; Dewatripont–Praet–Sapir, 2023; Király, 2023; Metric–Schmelzing, 2023*).

### 2.1 Silicon Valley Bank (SVB)

What happened in March 2023 can be regarded a classic run on the bank in the sense that as soon as rumours had spread among depositors the bank might be in trouble all depositors (holding uninsured deposits) wanted to withdraw their money. What was specific and made the situation particularly grave was the asset and liabilities composition of the bank. The liabilities of the bank mainly consisted of deposits by the start-up companies of Silicon Valley and (also start-up) firms engaged in issuing American crypto currencies.

Promising start-ups flourished when interest rates were low; they could attract lots of money easily, so those deposit portfolios had been growing fast until 2021.

According to its 2022 consolidated report (which was posted on the internet on 4 March 2023, a week before the run), the bank possessed USD 81 billion non-interest bearing and USD 92 billion interest bearing deposits (mainly sight deposits, term bank account deposits, and money market deposits). Of them, 151.5 billion, i.e., 88 percent of the deposits was uninsured (Silicon Valley Bank, 2023). Uninsured depositors, for instance, had learnt that Circle, the issuer of the second largest stable coin<sup>4</sup> (the USDC) held USD 3,3 billion out of the USD 40-billion collateral of the stable coins it issued in SVB as deposit. The high uninsured deposit portfolio, the concentrated deposit structure, and the channels of immediate flow of information to professional depositors and social media made the banking panic unexpectedly fast, practically, immediate. It is no accident that *Patrick McHenry* the chairperson of the House Financial Services Committee termed the panic “the first Twitter-induced” run on the bank” (McHenry, 2023).

The asset structure of SVB was also special. It had had no bad loans; it had not invested into risky enterprises. Its loan portfolio was a mere third of its balance sheet total. Long term bonds of US Government Sponsored Entities (GSE) had made up most of its assets. SVB had purchased those in a period of low interest rates, so it could gain interest income. A bit more than 20 percent of the bonds were in its trading portfolio and less than 80 percent were held until maturity. The difference between the two is that the trading portfolio must be recorded at daily market rate, but the portfolio intended to be held until maturity is posted at amortised cost<sup>5</sup>. The reason for that is a portfolio held until maturity will only have unrealised profit/loss, the total nominal value is paid back on maturity. At the end of 2022, the duration of the SVB portfolio held until maturity was 6.2 years (Silicon Valley Bank, 2023).

Obviously, the bank will have latent loss if interest rates grow, as its bond portfolio is devalued and raising deposit interest rates may also cause a loss because of the poor income-generating ability of the bonds. Such risks can be hedged on the market, which a bank operating with such high exposure must be aware of. According to its 2022 Annual Report, however, SVB failed to hedge its portfolio segment held until maturity, while most hedging transactions covering its trading portfolio had expired in 2021 and were not renewed in 2022.

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4 Stable coins are digital crypto instruments with their value pegged to an official currency. It is the US dollar for USDC. The co-movement of a stable coin and the dollar is guaranteed because the stablecoin has 100 percent liquid asset cover. In the case of USDC the cover comprises 77 percent of short-term US treasury bills and 23 percent of bank deposits. 3.3 billions’ worth out of the USD 9.7 billions’ worth bank deposits had been placed with SVB and then withdrawn before frozen (Cf, Circle report: )

5 Amortised costs mean the acquisition costs minus capital repayments received and credit losses.

All that can only cause bankruptcy if depositors start withdrawing their funds. To be able to satisfy its depositors, first the bank must sell its trading bonds portfolio and then also the bonds it intended to retain until maturity and were posted at amortised value. One can only sell at market value, which meant amortised value less about 20 percent because of interest rates raised by approximately 400 bps and 6.2 years of duration, so mass sale results in realised loss or bankruptcy in an extreme scenario. The bank's professional investors were aware of this, that is why they had a run on the bank, which in fact caused it to fail.

Thus, the highest risks the bank had assumed had been excessive maturity transformation (financing long-term GSE bonds from sight deposits) and high unsecured interest rate risk in the banking book, which had become unsustainable as inflation started and the FED raised interest rates in response.

Following the panic and the closure of the bank, the US Department of Treasury, the FED and the deposit insurer (FDIC) published a joint statement on 12 March declaring that all depositors could access their money beginning from Monday, 13 March to restore public trust in the banking system (Treasury–FED–FDIC, 2023). In addition to SVB, the measure also covered Signature Bank. The statement also said shareholders and some uninsured bond holders would not be saved. To avoid further bank panic, the FED also published another statement at the same time with the joint statement (FED, 2023) announcing the establishment of a new Bank Term Funding Programme. Under it, banks will be granted loans of not more than one year maturity so that the U.S. Treasuries and other qualified bonds will be accepted as collateral at nominal value. Silicon Valley Bank was acquired by First Citizen Bank, the 30th largest in the USA considered to be a medium-sized bank before the transaction. The sale agreement was published on 27 March.

## **2.2 Credit Suisse**

Credit Suisse had been struggling for years. It had financed several scandalous issues, bankrupt companies, or had sold their bonds as low-risk instruments to clients of its asset management business. The bankruptcies of Greensill Capital and Archegos Capital Management early in 2021 had the loudest echo. Side by side with its asset managed clients, Credit Suisse itself had a high exposure to the two companies. As a result of bad investments and the scandals, the funds managed for the clients had been diminishing on the one hand, and on the other hand, the asset management business had accumulated large losses. To solve the problems, the bank launched a major reorganisation programme in October 2022. Although the decline of share prices stopped in December, the outflow of the asset management portfolio entrusted to the bank continued even in Q4 2022. Still, the market

trusted reorganisation so much so that a CHF 4-billion capital increase could stabilise the bank's balance sheet. The capital increase had mostly come from Saudi National Bank, which had become the largest shareholder in Credit Suisse holding 9.9 percent, while the bank's earlier shareholders had also added their part.

The 2022 Annual Report was published in 14 March 2023 just when the US markets started to relax as a result of the FED intervention, but the atmosphere on global financial markets was still quite tense. According to the Report, the bank, which had already posted losses of CHF 1.6 billion in 2021, increased its losses to CHF 7.3 billion in 2022. In addition, the auditor's report by Price Waterhouse Cooper (PwC) found the bank's risk management processes were not suitable to identify and analyse risks, and the internal control system also had shortcomings (Credit Suisse 2023:258-III). As a result of the Annual Report, the bank's share price started to fall. At that point (on 15 March) an infamous interview took place with the president of the Saudi National Bank, who said he was unwilling to invest any more funds into Credit Suisse, after which the bank's share price plummeted by 24 percent in a day. The Swiss Central Bank and the Banking Supervision published a joint statement the same evening (SNB-FINMA, 2023), to the effect that Credit Suisse was compliant with regulatory requirements of capital and liquidity, but – if necessary – the Central Bank would provide it with liquidity.

However, those measures were insufficient to restore trust in the bank, money continued to flow out over the following days (both regarding deposits and the asset management portfolio). From there, events accelerated: the plan and the decision that USB the largest Swiss bank would acquire Credit Suisse was born at the weekend of 18-19 March. The acquisition rate became 0.76 cent/share, i.e., 40 percent of the pre-closure price of CHF 1.86. At first, 0.25 cents then 0.5 cents were mentioned in the news, bargaining with the largest shareholders may have been ongoing in the background. The shareholders of Credit Suisse received no money but were compensated in the form of UBS share exchange. The Swiss state provided guarantees of CHF 9 billion to support the success of the transaction and the Swiss National Bank opened a CHF 100-billion liquidity facility. On the other hand, holders of bonds that ranked among the bank's core capital elements by Basel III rules (the so termed AT1 bonds) were not compensated, they had lost all their investments. A part of those bonds was convertible to equities, but no conversion took place under the acquisition. In that way, a weird situation arose: holders of AT1 bonds lost more on their investment than the bank's shareholders, although - in theory - shares are the riskiest form of investment.

### 3 REGULATORY ANOMALIES AND LESSONS

#### 3.1 The question marks of the TBTF principle

Following the 2008 global financial crisis, the institutions responsible for financial stability set the elimination of the application of the TBTF principle as the goal in addition to the renewal of prudential regulation. Prior to the 2008 crisis, banks had grown so large that saving them from a potential bankruptcy would have been impossible for a single state. Therefore, *Demirgüç-Kunt* and *Huizinga* (2013) argued the largest banks were not too large to fail but too large to be saved, so the principle of “too-big-to-fail” should be replaced by “too-big-to-be-saved”. There were 30 banking groups in 2008 with liabilities exceeding 50 percent of their country’s GDP. The largest of them was USB in Switzerland with commitments of 3.7 times the Swiss GDP. The Credit Suisse Group was third on the list, its commitments amounted to 2.2 times the Swiss GDP (*Demirgüç-Kunt-Huizinga*, 2013, Table 1). The Icelandic banking crisis in 2009 is a practical example of how banks can grow too-big-to-be-saved by the country they reside in. Thus, reforms after the 2008 crisis took different directions to eliminate or at least mitigate taxpayers’ burden originating from the application of the TBTF principle or the moral risks encouraging banks to take excessive risks on the assumption that the TGTF principle will be applied.

Regulatory thinking to eliminate or at least radically confine TBTF set off after 2008 along four paths after 2008 (*Barth-Wihlborg*, 2016). They were the following:

1. Limit the growth of banks. Banking regulations after the USA crisis, the so termed Dodd-Frank law banned bank mergers if the deposit portfolio of the emerging bank would exceed 10 percent of the total US secured deposit portfolio except if the merger was linked to crisis management (Congressional Research Service, 2018). Still, as the case of SVB and Signature Bank shows, the size effect of the application of the TBTF principle can be much lower if authorities are worried about the impact of contagion. No such regulation has been introduced in Europe.
2. Enforce stricter rules related to the banks affected to ensure bigger loss absorbing capability. This category includes excess capital requirements or stricter regulatory requirements related to banks that are of key importance from the aspect of systemic risk. Basel III rules identify G-SIB, i.e., the group of banks of key importance from the aspect of global systemic risk and stipulate excess capital requirements for them. This, on the one hand, will improve the ability of the banks’ capital to absorb losses and, on the other hand, reduces the

moral hazard encouraging excessive risk taking rooted in TBTF by making capital more expensive. The Financial Stability Board (FSB) publishes the list of G-SIB banks every year including the capital buffer to be applied subject to their size. The latest 2022 list includes 30 G-SIB banks including Credit Suisse (FSB, 2022). In addition, the EU allows macro-prudential supervisory authorities to require capital buffers in the case of other credit institutions of systemic importance.

3. Introduce operational restrictions banning that a large group of financial activities be conducted within the same institution. In the US, the Dodd-Frank Act contains similar regulations; they are jointly termed the Volcker Rule. Under it, US banks are prohibited from engaging in proprietary trading and they cannot own or invest in hedge funds or private equity funds. This, in fact, meant the restoration of the relevant provisions of the Glass-Steagall Act adopted after the 1929–1933 crisis and repealed in 1999 (Congressional Research Service, 2018). Rules restricting banking operations have been placed on the agenda in Europe as well and several Member States introduced restrictions. The EU Commission, however, withdrew its proposal on the introduction of so termed structural reforms in 2018 on the basis that, on the one hand, no agreement could be achieved on the issue and, on the other hand, other reforms introduced and the establishment of the Banking Union had rendered them unnecessary (European Parliament, 2023).
4. Restructure the system of bank resolution. Under it, banks must set up recovery plans and the related decision-making mechanisms to be immediately activated if needed. In addition, to mitigate (or, according to more ambitious ideas, eliminate) the burden on taxpayers arising during resolution, the concept of “bail-in” was introduced to replace the earlier “bail-out”. It means banks will be saved by using, at least partly, bank sources (liabilities in the form of uninsured deposits) rather than government budgets. How the bail-in system operates is introduced in the next part. Under it, AT1 bonds can be recalculated as equity capital and can be written off or converted in the case of loss.

As regards SVB and Credit Suisse, only Credit Suisse seems at first sight to be a large bank carrying systemic risk, i.e., TBTF. Although SVB grew fast in 2021, it could not be considered a large bank. Still, the TBTF principle was used to save both banks. The two cases prove that removing the TBTF principle from banking policies, a basic regulatory target after the 2008 crisis, was not successful. If regulatory authorities are worried about spreading the crisis, they continue to accept TBTF as the single effective solution. It has also become clear that the G-SIB buffer is but a beauty spot for a bank the size of Credit Suisse, as its loss-

absorbing capacity can only compensate for lower falls. It may reduce the moral hazard caused by TBTF by making the average financing costs of large banks more expensive, but it is not enough to ensure bank stability.

SVB as a US bank supervised as a non-large bank did not need to have a recovery plan. Credit Suisse obviously did have such a plan and procedure, established, and probably practiced, but extremely fast market response and suddenly swelling problems did not allow them to be set off; immediate resolution had to be used to help. Bail-in was actually applied, but this does not only prove there is less need of using taxpayers' money but also that the instances when bail-in must be applied have not been properly identified. In other words, three out of the four principles aimed to confine TBTF (limitations on size, better loss-bearing ability and a reformed system of resolution including the use of recovery plans and bail-in) have not proved to be sufficiently effective or functional.

Lacking the introduction of operational limitations was the only one of the four elements that had no part to play in the actual situation. The collapse of Credit Suisse was largely the outcome of its investments but not through its proprietary trading rather than the irresponsible use of clients' investments it managed. Scandalous investments first caused huge losses of the asset managed portfolio, then the reduction of the portfolio, the absence of the relevant fees and commissions and the plunge of share prices because of the loss of confidence contributed to the bank's failure.

It is also evident that as UBS acquired Credit Suisse, a huge bank has come into being that is obviously TBTF, since its potential failure would cause major disturbance in the operation of not only the Swiss but also of the global financial system.

### **3.2 Regulate capital structure**

Strengthening banks' capital was one of the strongest expectations related to the system of banking regulations following the 2008 crisis, i.e., banks should have adequate capital both in quantity and quality. Accordingly, the regulations identify three types of bank capital having the following features and required minimum values (BCBS, 2023):

1. *Common Equity Tier1, CET1*. CET1 capital must cover at least 4.5 percent of a bank's total risk exposure. Taking into account the capital conservation buffer, the required level of CET1 capital is 7 percent. This category includes the bank's ordinary shares, the related premiums and the reserves from profit after taxes. CET1 capital is able to bear bank losses on a going concern basis.

2. *Additional Tier 1 capital, AT1*. It comprises so termed hybrid elements issued in the form of perpetual bonds, but – similarly to CET1 capital – can absorb losses in going concern situations. The total value of CET1 and AT1 capital must be at least 6 percent of the bank’s total risk exposure, i.e. 8.5 percent including the capital conservation buffer. Hybrid instruments can be included in bank capital on condition that AT1 bonds can either be converted into ordinary shares or written off if the bank’s CET1 capital falls below 5.125 percent or if it becomes necessary for another pre-defined reason. The conversion or write-off must be to such extent that the primary core capital index reaches 5.125 percent.
3. *Tier 2 capital, T2*. This category includes capital items that will absorb loss in the event of a potential liquidation (gone concern) so that they are junior to the bank’s creditors and senior only to Tier 1 capital owners in case of a winding-up procedure.

The case of Credit Suisse has raised the issue of the hierarchy of capital items and the part they play in loss-bearing. Had Credit Suisse been liquidated, shareholders clearly would have been at the end of the queue in the rank of satisfaction, immediately preceding the owners of AT1 capital items. However, acquisition by USB had created a weird situation, i.e., holders of AT1 bonds received no compensation, while shareholders were given USB shares. The Basel documents provide no guidance for such situations. However, the hierarchy of capital items or the essence of capital would logically yield that the holders of ordinary shares are the ultimate loss bearers that can only get their money when everybody else has already been satisfied. Naturally, holders of AT1 bonds are aware they have purchased high-risk investment; that is why the interest rate paid on AT1 bonds by Credit Suisse was outstandingly high, 9.75 percent. Still, it does not mean their bonds are riskier than ordinary shares. The rules on write-off of AT1 bonds are clearly ambiguous, for instance, what “going concern” loss absorption means in an acquisition.

A joint statement was published on 20 March 2023 by the Banking Supervision of the European Central Bank, the Single Resolution Board of the EU, and the European Banking Authority (ECB–SRB–EBA, 2023). They emphasise that, according to the bank recovery regime of the European Union, ordinary shares are primary bearers of losses and the write-off of AT1 bonds can only occur if shareholders cannot bear any more losses (because they have been written off to zero). The statement also advises the above will be applied in future if banks in the EU are resolved. The statement was quite important because if it is possible that AT1 bonds bear higher losses than ordinary shares, the market of AT1 bonds will become untenable.

It is another question whether the happenings on 18-19 March can be regarded as triggers for the write-off of AT1 bonds since the share price rather than the capital adequacy of the bank had collapsed. Credit Suisse, like SVB, may have been forced to sell assets later due to the loss of confidence and the loss from the fire sales resulting in a loss would have undermined its equity position, but that did not happen. According to its 2022 Annual Report, its CET1 capital adequacy ratio was 14.1 percent on 31 December 2022. However, there are softer options for a potential write-off of AT1 bonds, the circumstances of which may be questioned. Several proceedings are expected to be launched about whether AT1 bonds could have been written off and their outcome will influence if the market of AT1 bonds survives or not.

### **3.3 Regulate interest rate risk in the banking book**

As one could see when the factors leading to the fall of SVB were presented, the number one cause of its failure was the bank held in its books a high volume of low-interest, long-term government bonds to be held until maturity. As interest rates increased, a huge latent loss was generated (which turned into actual loss when those bonds had to be sold), i.e., the interest rate risk in the banking book was high. In the Basel regulatory framework interest rate in the banking book belongs to the so termed second pillar risks, i.e., there is no mandatory capital requirement to cover it; banks only must allocate capital subject to the findings of supervisory review.

An additional problem with respect to SVB is that small and medium-sized banks are not in the scope of the Basel regulations in the USA, so the requirement does not affect them. But let us forget about this now and let us see what would have happened if SVB had been subject to the stricter Basel regulations or if a European bank had been in a situation similar to that of SVB. The regulatory framework of interest rate risk in the banking book is included in the relevant Basel Standard (BCBS, 2016), in CRD in the EU<sup>6</sup> and the guidelines of the European Banking Authority (EBA) based on it (EBA, 2022a and 2022b). Accordingly, all banks must have a system assessing interest rate risk in the banking book, which also includes background principles, methods of measurement and risk limits. Banks also must prove they have adequate capital to cover losses from potential interest rate changes. As an important part of the regulation on interest rate risk in the banking book is that banks must perform interest rate risk stress tests at least annually but more frequently if the volatility of interests or the exposure of the bank

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6 Directive 2013/36/EU.

to interest rate risk in the banking book increases. The supervisory authorities of different countries may require more frequent stress tests too, MNB for instance, requires them to be performed at least quarterly (MNB, 2022). Side by side with stress tests by the institutions, supervisory authorities also perform stress tests regarding interest rate risk in the banking book, which are termed supervisory outlier tests - to differentiate them. Their specific goal is to inform the supervisors which banks are extremely exposed to interest rate risk in the banking book.

The Directive expects interest rate risk in the banking book to be analysed as per six scenarios. They are the following: 1-2) parallel shift of the yield curve downward or upward; 3) yield curve becoming steeper (short-term interest rates decrease, long-term interest rates increase); 4) yield curve flattening (short-term interest rates increase, long-term interest rates decrease); 5-6) increase or decrease of short-term interest rates. The Directive assigns three shock-related measures to the six scenarios.<sup>7</sup> The Basel Committee and likewise the EBA guidelines identify, broken down by currency types, the interest rate shift at which stress tests must be performed for each type of shock. For instance, for USD, 200, 300 and 150-bpp stresses belong to the yield curve's parallel, short, or long shocks. In EUR, they are 200/250/100 bpb. USA regulators require banks in the scope of Basel rules to perform stress tests at 200 bpb. Based on the findings of their own and supervisory stress tests, banks must allocate excess capital to cover interest rate risk in the banking book if the findings show high exposure to it. In the case of SVB, one cannot speak of a short shock, as the problem had been generated by the increase of long-term interest rates. Both BIS and EBA would recommend applying the 200-bpb stress scenario in such a case.

To sum up, interest rate risks in the banking book belong to risks mandatorily regularly measured and managed by large banks in the US and by all banks in the EU. However, supervisory and possibly bank stress scenarios expected stress tests to be performed at lower values than what the actual (really extreme) USD interest rate increase was like. In fact, regulations recommend that banks should use a higher stress scenario if necessary, but as supervisory reviews are carried out by annual plans, there is a good chance it would not have happened in another country either or would have happened immediately before the supervisory review only. In other words, stress tests do not always provide proper protection against extreme, large, and rare interest rate changes.

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<sup>7</sup> The three possible forms of the yield curve shift one must consider are: parallel, the shock appearing on short-term maturity and the so termed long shock to be applied if the yield curve becomes steeper or flatter.

### 3.4 Liquidity rules

There had been no global liquidity rules prior to the 2008 crisis. There were countries where banks had to comply with specific liquidity requirements, but it was not a general expectation. In the Basel II framework, liquidity risk as well as interest rate risk in the banking book belonged to second pillar risks, and the regulated management of liquidity risks in observance of proper procedures was in focus. It is true supervisory authorities could have, in principle, require capital to cover liquidity risk under Pillar 2, but there was consensus that liquidity risks could not be managed via capital adequacy. However, the markets dried up after the Lehman Brothers' failure in September 2008; banks operating with high money market exposure met with major difficulties, which drove regulators to renew liquidity rules (Rochet, 2008). In response to the crisis, the Basel III regulation requires banks to comply with two mandatory liquidity ratios. The new ratios belong to the toolset of macro-prudential regulations, as inter-bank borrowing allows individual banks to manage liquidity shortage. However, bank liquidity buffers may help maintain liquidity if market disturbances arise and there is no access to inter-bank markets.

The first ratio, liquidity coverage ratio (LCR) is a short-term one that is meant to ensure a bank has a liquidity buffer of a suitable size, i.e., a volume of high quality liquid assets, which ensures survival in a stress situation if owners withdraw volatile sources from the bank. LCR rules define the net cash outflows to be calculated and the eligible liquid assets for coverage.

Analysing SVB from the aspect of compliance with LCR, the first question is whether the deposits of start-up companies should be considered when net cash outflow is defined. According to the Basel guidelines (BCBS, 2013), the part of deposits of non-financial undertakings that have been deposited with an operational purpose (i.e., the depositor deposited them in order to use cash management or some other service) must be taken into account multiplied by 25 percent and the part with a different purpose by 40 percent for calculating cash outflow. We do not know the structure of the deposits placed with SVB. However, due to their big concentration, one can assume start-up deposits would be in the 40-percent outflow category, i.e., no more than 40 percent liquid assets should be set aside for them. The deposits by banks, investment companies, insurers and other financial undertakings have a 100-percent outflow factor. Stable coin issuers (like the Circle with large deposits with the bank) are also categorised as non-financial undertakings, the 40-percent factor relates to them. The second question is how many liquid assets SVB had. LCR rules do not differentiate assets in the trading book (held for sale) from assets in the banking book (to be held until maturity). According to Basel III regulations, instruments issued by GSEs belong to level 2A

high quality liquid assets. These assets can account for up to 40 percent of total eligible liquid asset holding. Thus, although the LCR ratio would have indicated that there was a potential short term liquidity problem for the bank, it would have been significantly underestimated.

The other liquidity ratio, net stable funding ratio (NSFR) formalises a requirement of a one-year time horizon, i.e., the bank finances long-term assets from long-term sources. To calculate the ratio, the required stable funding (RSF) must be defined subject to the composition of the assets and the bank must possess at least the same quantity of available stable funding (ASF). In other words, the level of ASF must reach 100 percent of RSF. Under the NSFR regulation (BCBS, 2014), level 2A high quality liquid assets are assigned at 15 % RSF factor, i.e. 15% stable funds should be allocated behind them. . For ASF calculations, 50 percent of the short-term deposits by non-financial undertakings can be considered as sources. In other words, in the case of US GSE bonds the Basel and EU rules stipulate 15 percent stable funding, which the funding “stable” deposits (to be considered at 50 percent) exceed several times. To sum up, what one can see is that under the Basel III liquidity rules, the NSFR would have indicated no liquidity problem at all for SVB Bank, while the LCR would have indicated a much smaller liquidity problem than the actual one.

#### 4. LESSONS DRAWN

In the paper the lessons drawn from the regulations becoming known during the failure of SVB and Credit Suisse were analysed. A particular significance of the issue is that the system of banking regulations has been transformed following the 2008 global financial crisis both in terms of regulatory principles and actual techniques.

Four regulatory tools were analysed in the paper. All of them were adjusted as seen in the toolset of banking regulations implemented after 2008, and one could be reassured they would be suitable to reach the regulatory targets. However, the current regulations on all four issues have been found lacking and unable to guarantee the stability of banking systems, to be resilient vis a vis crises and to resolve potentially emerging crises in an orderly manner by applying pre-defined rules without using taxpayers' money. In relation to all the four issues it is documented that the new regulations might have been effective to prevent earlier crises had they been available at the time, however, they proved to be inadequate to solve a crisis which was somewhat different.

Rather than eliminating the TBTF principle, it was applied in the case of both banks, although the case of the much bigger Credit Suisse alone justified the in-

volvement of taxpayers' money. During the crisis management, the mandatory recovery plans were not applied. SVB probably had no such plan anyway, because the rules relating to large banks were not pertinent to it, while Credit Suisse had no chance to apply the plan because of the rapid rate at which the crisis evolved. It was also evident the higher capital adequacy requirement linked to G-SIB status was much lower than the necessary capital level. Thus, the elimination of TBTF, a primary objective of bank regulation, cannot be called a success story.

With respect to the issues of the actual technical regulatory measures having become known, although they can be described as grand and ambitious and they are much stricter than their predecessors before 2008, they are still unsuitable to manage the relevant risks. Stricter and harder equity rules were thought to be well designed; the cases and ranking of the use of the different Tier capitals seemed to be unambiguous. However, they did not prove to be unambiguous in a live situation. As for the capital requirement to cover interest rate risks in the banking book and the related stress tests, they proved to be quite under calibrated. They did not consider a situation like the current interest rate increases while interest rates do fluctuate highly from time to time. It can be argued whether such situations should be managed by compliance with the interest rate risk in the banking book-related capital requirement (probably not) or some quite different tool should be found. Finally, the analysis of liquidity regulations with respect to the SVB case made it clear that NSFR ratio was completely inadequate and the LCR ratio partially inadequate to provide a timely indication of liquidity problems.

What lessons can be drawn from all that? One can mainly say very complicated rules that need a lot of calculations and procedures may create the illusion of everything being well regulated. Until the next crisis hits, they can depict banks as well capitalised, liquid, resilient to shock - if they are gauged in line with the rules. However, as soon a shock occurs following an unexpected never-seen-before scenario, the illusion will easily disintegrate. It turns out we see the new clothes of banking regulations beautiful as long as we want to. And then suddenly, something breaks the fog, the new clothes are but an illusion. And with that one can return to the question raised by Admati and Hellwig; i.e., can banks operating with high leverage be stable at all? Another solution has been shaped that may be suitable for the management of risks since Admati and Hellwig made their proposal to radically reduce leverage. Since they formulated their proposal for radical deleveraging, one more potential solution emerged that may adequately address the risks involved. It is the introduction of central bank digital currency (CBDC). According to the CBDC proposal, commercial banks will not create money, instead, all payments in the economy are made with the digital instruments issued by the central bank, which will, in that way, guarantee full liquidity of the payment system for all times. The world's central banks are working hard

to implement the idea (*Boar-Wehrli, 2021*), including the project of the digital Euro by the European Central Bank<sup>8</sup>, but it certainly will not become reality soon (*Danielsson-Goodhart, 2023*).

The failure of the two banks studied warn that bank regulations though looking to be strict cannot eliminate the impulse of assuming extreme risks and the moral hazard boosted by deposit insurance in the case of banks operating with high leverage and when short-term liquid bank deposits or money market sources finance bank assets.

Regulatory responses are expected to relate to the transformation / expansion / re-calibration of actual rules, for instance, increasing the outflow coefficients of the LCR, or raising interest rate changes in the stress scenarios applied for the capital requirement for interest rate risks in the banking book, or re-regulating liquid assets. All those measures, however, fail to raise the primary question, i.e., whether the current operating models of the banking system are suitable to meet the expectations formulated for banking regulations. I believe a regulatory environment ensuring the stability of banking systems or the radical reduction of leverage recommended by Admati and Hellwig can be the solution by reducing the banks' inherent moral hazard through increasing shareholders' risk assumption, or the introduction of CBDC. Until one or another of them takes place, banking crises will remain with us in an increasingly complex, over-regulated environment.

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8 You can find a summary of the relevant ECB project at:

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