BANKING MARKET TURBULENCE IN MARCH 2023

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Abstract: *At the end of the first half of March 2023, the most important banking markets in developed countries began to show signs of crisis, with stock markets falling, three banks in the United States and one in Europe were declared bankrupt, and others from roughly the same geographical areas were saved. The fear of a new crisis, this time of a banking nature, and of a global contagion made the banking authorities, government representatives or important bankers react quickly, making available to financial intermediaries important funds, but also with statements to calm the markets. This communication addresses three issues. The first refers to the term crisis that the press, as well as specialists, have used to name these turbulences on the banking markets. The second problem addressed in the communication concerns the causes of the turbulences, and the third problem analyze the particularities of these turbulences, in relation to the banking crises of the recent past.*

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1. About banking crises

Financial crises are generally regarded as credit booms gone badly (Schularick, Taylor, 2012). Banking crises generated by credit booms are those that are preceded by a period of sustained above-average growth in private credit - especially bank credit - and a subsequent collapse of the boom. The idea is not new, and is also found in the work of Minsky (2011) and Kindleberger&Aliber (2015). However, from the above delineation we note that these are financial crises and not banking crises, even if their origin is credit. Other authors also deal with banking crises, especially in the literature after the 2007-2008 crisis: Reinhart & Rogoff (2009), Caprio&Klingebiel (1996), C. Romer & D. Romer (2015), Boyd, De Nicolò & Loukoianova (2009). However, in most of the mentioned works, banking crises are not totally separated from financial crises and some of the works deal with the causes of banking crises.

Matthew Baron, Daniel Dieckelmann (2022) are of the opinion that the previous definition needs to be qualified because a large number of banking crises are not caused by large increases in credit. Thus, from an analysis of the data on banking crises, Baron, Dieckelmann find that "*the share of banking crises caused by real sector shocks, such as natural disasters, wars and recessions, has declined significantly over time, making the financial sector the main origin of banking crises today*". However, only "*35% of all banking crises - and 40% of those with large-scale bank failures - are credit process booms*" and that "*an increasing share of banking crises are the result of international contagion*". Specifically, the causes of banking crises identified by Matthew Baron, Daniel Dieckelmann are due to:

- strong domestic credit growth;
- strong increases in asset prices (financial securities, real estate prices, commodity exchange prices);
- commodity market crises;
- currency or gold crises;
- financial crises (generated by public finances, exchange rate depreciation or private or banking financial flows);
- wars;
- natural disasters;
- political crises;

- other causes (structure of the banking system, bank management, internal recessions, consumer price instability).

An interesting observation by Baron & Dieckelmann is that many of the banking crises tend to cluster, with analyses resulting in globally or regionally clustered crisis periods that often originate from a financial centre, and that "*about a quarter of all banking crises in the sample [...] are due to contagion and financial interconnectedness and can occur regardless of macroeconomic or financial conditions in the domestic economy*". We also note Baron&Dieckelmann's conclusion that due to the accumulated resilience of banking systems around the world "*banking crises will not occur on a large scale*".

Interesting observations can also be found in the analysis of the causes of banking crises by Pereira, Ramalho & da Silva (2018). Thus, the aforementioned authors find evidence that (a) bank debt (without deposits) has positive effects on the probability of failure; (b) customer deposits are not a relevant factor and have a negative influence on bank crises; (c) there is a higher probability of bank crises for countries where banks are on average more leveraged; (d) partial support for the hypothesis that a higher share of customer deposits in total debt mitigates the probability of failure by providing a buffer against failure; (e) bank size is also a significant variable in explaining bank crises, having a negative influence on the probability of bank crisis (in the sense that countries where banks are, on average, larger have a lower probability of failure; (f) economic growth is negatively related to the probability of bank crisis, suggesting that many crises are more likely in a weak macroeconomic environment; (g) the inflation rate is an important determinant of banking crisis, positively affecting the probability of a banking crisis; (h) GDP per capita is irrelevant in explaining a banking crisis (in other words, "the *results of the analysis highlight the role of economic growth on countries' financial stability; if economic growth slows, non-performing loans increase, some savers will withdraw their savings to meet financial needs, and bank liquidity decreases, but in times of economic growth the probability of these occurrences is lower, mitigating the possibility of failure*"); (i) there is strong evidence of contagion between OECD countries, whether between those in the same region or induced by G7 countries, but the contagion effect between countries in different regions does not seem to be particularly relevant.

Closer to the delineation of a banking crisis is Demirgüç-Kunt and Detragiache (2002), who consider a systemic banking crisis to be a *"...situation in which significant segments of the banking sector become insolvent or illiquid and cannot continue to operate without special assistance from monetary or supervisory authorities*".

A clearer answer to the question of what is a banking crisis is found in Luc Laeven, Fabian Valencia (2018) who define a banking crisis as an event that meets two conditions:

1) Significant signs of financial distress in the banking system, through significant withdrawals of bank deposits, losses in the banking system and/or bank liquidations;

2) Significant intervention measures in banking policy in response to significant losses in the banking system.

It considers that in the first year in which both criteria are met, the crises become systemic, affecting the entire banking system, and if banking sector losses and/or bank liquidations are large, then the first condition is sufficient for the banking crisis to be a systemic one. The same source also proposes some quantitative measures for the variables that operationalise the crisis. Thus, "*losses are severe when either (i) a country's banking system shows significant losses that result in a share of non-performing loans exceeding 20% of total loans or the closure of banks with at least 20% of the banking system's assets or (ii) the fiscal restructuring costs of the banking sector are sufficiently large, exceeding 5% of GDP*". The authors note that defining the crisis solely on the basis of the first condition is not

a safe solution, because it is "*difficult to quantify the degree of financial distress in a banking system, especially in low- and middle-income countries, and also because losses can be mitigated by policy responses*", and to overcome the problem we use the second condition, "*considering that policy interventions in the banking sector are significant if at least three of the following six measures have been used*": 1) the introduction of restrictions on bank deposit withdrawals and/or the declaration of public holidays (days on which banks are closed); 2) government takeovers of systemically important financial institutions, including cases where the government takes a majority stake in such significant financial institutions; 3) fiscal costs of bank restructuring amounting to at least 3 percent of GDP (such as recapitalization costs); 4) liquidity provided to banks by monetary authorities or directly by the Treasury is significant, of at least 5 percent of deposits and liabilities owed to non-residents; 5) significant government guarantees are provided to banks (full liability protection by the government or government guarantees are extended to other non-deposit liabilities of banks); and 6) significant purchases of bank assets, of at least 5 percent of GDP.

2. Preconditions for the banking turmoil in March 2023

I. Commercial banks traditionally invest a large part of their resources in securities listed on capital markets. Among the securities in which banks invest their resources, government securities, such as bonds or treasury bills, are preferred because they bring them returns, have minimal risks and are a potential liquidity reserve for when customers demand more cash than the bank has in its treasury. Also, when banks calculate their liquidity and solvency, investments in government-issued securities have low or even zero provisioning ratios. In addition, government securities held in banks' portfolios are frequently used by banks as collateral for borrowing from the central bank or other banks or for participation in interbank payment facilities.

The problem is that during 2022, in order to combat the global inflationary crisis, central banks have started to raise benchmark interest rates (Table 1). And the increases for one year have been explosive: for the US more than 30 times, and for the European Union 15 times.

Table 1. Evolution of central bank interest rates (%)

Column title	Ian 2021	Jul 2021	Ian 2022	Jul 2022	Ian 2023	Apr 2023	May 2023
USA - interest rate on federal funds (FED)	0,1	0,15	0,15	1,65	4,4	4,9	5,15
EU - marginal lending rate - ECB	0,25	0,25	0,25	0,75	2,75	3,75	4.00

Source: www.ecb.eu, www.federalreserve.gov

The rise in interest rates, during the 2021-2023 inflation hike, with which central banks were borrowing their funds did not remain without consequences for domestic financial markets, where most interest rates on securities, including new government-issued securities, rose. This caused bonds issued in the previous period, including government bonds, when interest rates were low, to fall sharply in value, reducing the value of the holders' portfolios, including banks, and in the event of their sale, causing losses for the sellers. It should be noted that the loss arises only in the case of selling government securities issued during the period of low interest rates and not in the case of holding these securities to maturity. When these losses are unrealised, this does not cause the bank to cease trading, as the bank will receive full payment under the original terms of the bond. However, if it is forced to sell these securities at a price below the current market price, losses on these types of assets become realised, meaning significant risks for the bank, and even implying that it may not be operational in the future.

II. After the financial crisis of 2007-2008, regulators of these markets and authorities adopted a series of new rules to avoid future crises. The rules, known as Basel III, aimed to ensure that banks had adequate capital, correlated to assets, and liquidity. Although the application of the rules or parts of them have been delayed (including by the COVID-19 pandemic), they have nevertheless been much better applied in Europe than in the US. Thus, according to François Villeroy de Galhau (Hotnews, 2023), governor of the Bank of France, 400 European banks comply with Basel III rules, compared with just 13 in the US. That's because under President Donald Trump, the Economic Growth, Regulatory Relief and Consumer Protection Act 174/2018 was passed, exempting small and medium-sized US banks from Basel III rules. Stricter prudential requirements for banks had been enacted by the Dodd-Frank Act (Dodd-Frank Wall Street Reform and Consumer Protection Act) on July 21, 2010, under President Barack Obama, which reorganized the financial regulatory system, eliminating the Office of Thrift Supervision, assigning new responsibilities to existing agencies such as the Federal Deposit Insurance Corporation, and creating new agencies, such as the Consumer Financial Protection Bureau - charged with protecting consumers from abuses of credit cards, mortgages and other financial products, the Financial Stability Oversight Council and the Office of Financial Research to identify threats to the financial stability of the United States.

Specifically, under the 2018 US deregulation law, the eligibility threshold for Basel III rules based on total bank assets was raised from $50 billion to $250 billion. Of note, some banking experts said Silicon Valley Bank and Signature Bank would have managed their risks better if the regulatory law had not been changed. Additionally, it should be added that SVB CEO Greg Becker explicitly lobbied for passage of the Dodd-Frank Act amendment because of the frequency and number of stress test scenarios required, implemented under the Dodd-Frank Reform and Consumer Protection Act, for banks with assets under $250 billion. Other experts, however, believe this is incorrect, because Silicon Valley Bank, was required under the new law to undergo regular periodic stress tests, and the Federal Reserve Bank of San Francisco, under whose authority SVB was located, had the discretion to annually examine any bank with assets over $100bn.

III. Several banks also gained from exposure to the cryptocurrency market and business with cryptocurrency-related firms before and during the COVID-19 pandemic, but which, after the bursting of the bubble in 2020-2022, began to negatively affect those banks starting in late 2022.

3. Timeline of the banking turmoil since March 2023

Between 8 and 12 March 2023, i.e. in just five days, the international financial markets and public opinion thought that a new banking crisis had begun, similar to the one in 2007-2008.

Three small and mid-sized US banks failed, triggering a sharp drop in global bank share prices and a swift response from regulators to prevent potential global contagion. The three failed banks that heated up the markets were Silvergate Bank, Signature Bank, both with significant exposure to cryptocurrency markets, and Silicon Valley Bank, which faced a run on bank deposits triggered by concerns from wealthy depositors with balances in excess of $250,000 (the deposit cap insured by the Federal Deposit Insurance Corporation-FDIC) about the bank's liquidity after it sold its Treasury bond portfolio at a large loss. Secondary players were Credit Suisse, Deutsche Bank in Europe and First Republic Bank and PacWest Bank in the United States. The collapses of Silicon Valley Bank and Signature Bank are believed to be the second and third largest bank failures, respectively, in recent US financial history, but smaller than the collapse of Washington Mutual Bank during the 2007-2008 financial crisis.

Chronologically and briefly, the events were as follows:

1. **The collapse of Silvergate Bank** (wikipedia.org, 2023)**, a** bank with assets of $15 billion in 2022Q3. On March 8, 2023, facing continued losses from mark-to-market sales of securities in which it had made investments, Silvergate Bank issued a public notice, requesting voluntary liquidation and promising to return all funds on deposit to owners. Silvergate Bank was a California-based bank that began operations in 1988 as a savings and loan association. Starting in 2010, the bank began offering banking services to cryptocurrency market players, and in 2014, the bank sought regulatory approval to do business with cryptocurrency firms. As a result of this refocus, servicing cryptocurrency exchanges and other companies that were involved in the cryptocurrency business, the bank's assets reached $1.9 billion in fiscal year 2017, but as a size, the bank remained a small one, with only three branches in 2018 (wikipedia.org, 2023). The same source notes that by the end of 2022, 90% of the bank's deposits related to cryptocurrency businesses or cryptocurrency firms exceeded $1 billion. At the same time, Silvergate Bank also owned a real-time transaction settlement system, the Silvergate Exchange Network, which allowed a customer to send payments in US dollars from their Silvergate Bank accounts to those of another of the bank's customers without requiring an interbank wire transfer. The relatively fast settlement of transactions made through the Silvergate network has led a large number of cryptocurrency companies to open accounts at the bank to take advantage of the short transfer times. Although, much of the activity was in the cryptocurrency market, Silvergate Bank's placements had a relatively conservative profile, holding mortgage-backed securities as well as medium- and long-term bonds issued by US government or municipal agencies, which while having minimal default risk, had associated interest rate risks (see comment I).

Silvergate is a victim of not just the March 2023 turmoil, having been hit as early as November 2022, when it bankrupted cryptocurrency exchange platform FTX, and the bank's customers demanded deposit withdrawals, and because it did not have sufficient liquidity it had to sell assets, recording losses of over $0.7bn in Q4 2022 alone. However, at the end of 2022, Silvergate declared itself solvent, reporting cash and cash-like assets of $4.6 billion, liquid securities assets of $5.6 billion and deposit liabilities of $3.8 billion. In the following months, the first few months of 2023, Silvergate continued to incur losses from securities sales and borrowed $3.6 billion (Wallerstein, 2023). Other sources (Saini, Nishant & Lang, 2023) say that total deposits from Silvergate's crypto asset customers fell to $3.8 billion at the end of December, compared to $11.9 billion as of the end of September 2022, that the bank sold $5.2 billion worth of debt securities at a loss of $718 million in the fourth quarter to maintain its liquidity.

2. The failure of Silicon Valley Bank (SVB), a bank with assets of $211 billion in 2022 (wikipedia.org, 2023). On 10 March 2023, after several tense days, the California Department of Financial Protection and Innovation (DFPI) declared SVB bankrupt and placed it under receivership by the Federal Deposit Insurance Corporation (FDIC), the US agency in charge of guaranteeing deposits, marking the collapse of the 16th largest bank in the United States. Silicon Valley Bank (SVB) was a commercial bank founded in 1983, headquartered in Santa Clara, California. SVB served companies or individuals in the technology industry. Companies such as Airbnb, Cisco, Fitbit, Pinterest, and Block, Inc. were clients of the bank. About half of the U.S. healthcare and technology companies were funded by SVB. SVB was also known for its private banking services, lines of credit for individuals or mortgages for tech entrepreneurs. When it took over the bank, the FDIC announced that SVB had $209 billion in assets at the end of 2022.

Table 2. Evolution of Silicon Valley Bank assets (billion USD)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Actives	6,1	6,7	10,0	12,6	17,5	20,0	22,8	26,4	39,3	44,7	44,7	51,2	56,9	71,0	115,5	211,3	211,8
Warehouses	4,1	4,6	7,5	10,3	14,3	16,7	19,2	22,5	34,3	39,1	39,0	44,3	49,3	61,8	102,0	189,2	173,1
Non-interest-bearing deposits	3,0	3,2	4,4	6,3	9,0	11,9	13,9	15,9	24,6	30,9	32,0	36,7	39,1	40,8	66,5	125,9	80,8
Equity capital	0,6	0,7	1,0	1,1	1,3	1,6	1,8	2,0	2,8	3,2	3,6	4,2	5,1	6,5	8,2	16,2	16,0
Income	0,5	0,7	0,6	0,5	0,7	0,9	1,0	1,4	1,5	1,5	1,7	2,0	2,7	3,5	4,1	6,0	7,4
Net profit	0,1	0,1	0,1	0,0	0,1	0,2	0,2	0,2	0,3	0,3	0,4	0,5	1,0	1,1	1,2	1,8	1,5

Source: https://en.wikipedia.org/wiki/Silicon_Valley_Bank

Table 2 shows that Silicon Valley Bank saw an increase in its deposits during the COVID-19 pandemic, when the tech sector experienced significant growth. To leverage its large deposits, starting in 2021, it began buying long-term US Treasury bonds. But starting in 2022, as the Federal Reserve System gradually raised interest rates to stem rising inflation, the market value of bonds issued in previous years fell, with holders selling them to buy new, higher-interest securities. This affected those holders who kept the old bonds, because the value of their bond portfolios was falling. Concurrent with the decline in the current value of bonds issued prior to 2022, rising interest rates also drove up borrowing costs across the U.S. economy, causing many U.S. bank depositors, including Silicon Valley Bank customers, to withdraw money to meet their liquidity needs. SVB, faced with heavy demands for deposit withdrawals, on March 8 announced it had borrowed $15 billion, sold more than $21 billion worth of securities and was preparing for an emergency sale of treasury bills to raise another $2.25 billion. But the announcement, rather than allaying depositors' fears, which were compounded by warnings from major Silicon Valley investors, rather triggered the biggest banking panic since the 2007-2008 financial crisis and caused a massive run on bank deposits, with customers withdrawing $42 billion in funds in the night that followed. The banking panic was amplified by social media, on which management's announcements that it had liquidity to repay deposits quickly went viral and were misunderstood (that the bank had no liquidity and was merely trying to calm the markets). Deposit flight has been facilitated by the new remote banking channels (mobile banking, internet banking) whereby customer migration is quick, queue-free and operational even outside of physical counter hours. Another factor contributing to the panic and deposit withdrawals was the fact that about 89 percent of SVB's $172 billion in deposits exceeded the FDIC-insured maximum of $250,000, so they were certain to be lost in the event of bankruptcy. To appease depositors and the markets, on March 14, the FDIC received an exceptional authorization from the US Treasury and announced that all depositors would have full access to their funds starting the next morning. At the same time, the FDIC, in order to be able to quickly honour depositors' withdrawal requests, opened a new bridge bank, Silicon Valley Bridge Bank, after holding a tender for the assets of Silicon Valley Bank that attracted only one bid, which was rejected by the originator (PNC Financial Services and RBC Bank, which had originally submitted a takeover bid, withdrew their bids). The story ended on March 26, 2023, when the FDIC announced that First Citizens BancShares would acquire SVB's commercial banking business. Thus, First Citizens took over about $56.5 billion of SVB's deposits and $72 billion of SVB's loans, while about $90 billion of SVB's investments remained in receivership, and SVB's 17 branches reopened, on March 27, 2023, under the First Citizens brand the next day, with SVB depositors becoming First Citizens customers. Subsequently, First Citizens, also took over SVB's Private Banking division.

3. **Signature Bank bankruptcy**, a bank with assets of $110 billion in 2022 (wikipedia.org, 2023). On March 12, 2023, the third bankruptcy occurred, Signature Bank, which was closed by regulators at the New York State Department of Financial Services and

placed in receivership by the FDIC, which immediately established a bridge bank, Signature Bridge Bank, to take over the healthy assets of the failed bank. Signature Bank was a New York City-based second-tier (state) bank, established in 2001 as a subsidiary of an Israeli bank, Bank Hapoalim, specializing in lending to small businesses in New York City and adjacent areas, as well as to individuals, providing loans to multifamily homeowners in the New York area (statistics, note that as of 2019, about 40% of the bank's loans - $15.8 billion out of a total of $38.9 billion went to multifamily homeowners). In order to reduce its reliance on real estate lending, Signature Bank has started to move into the crypto area since 2018. As this niche was fairly rarely addressed by banks, deposits held at the bank grew from $36.3 billion at the end of fiscal year 2018 to $104 billion by August 2022, about 25% of which were from companies operating in the cryptocurrency space, with Signature Bank becoming the second largest provider of banking services to the cryptocurrency industry after Silvergate Bank. At the same time, Signature Bank organised a payment network, Signet, for crypto customers, which opened in 2019 and allowed real-time gross settlement of funds transfers via blockchain without intermediaries and fees. The same source notes that by the end of 2020, 740 Signature Bank customers were using Signet, and in the following years the network continued to expand, integrating TrueUSD in 2021 or cryptocurrency intermediary Coinbase in 2022. The services offered by Signature Bank in this niche market and, in particular, the possibility offered to cryptocurrency companies to use the bank's services, gave legitimacy and credibility to the sector and stimulated its growth and the orientation of part of the public towards cryptocurrency grey area operations. This is best seen in the value of one share of the bank, which has risen from $75 to $375 per share in one year and has made Signature Bank a "cryptobank" in the eyes of the public, with fluctuations in the crypto market also impacting the bank. So the price declines of cryptocurrencies throughout 2022, as well as the bankruptcy of crypto intermediary FTX in November 2022, caused many Signature Bank customers to withdraw from their deposits (the source cited, indicates a significant run on deposits, with deposits falling from $106.1 billion in early 2022 to $88.6 billion in late 2022). At the same time, some of the bank's traditional non-crypto customers, such as private bankers, as yields in other financial areas began to rise due to rising interest rates, began to withdraw their deposits for better placements. In addition, Signature Bank's image wasn't looking good either. In addition to its association with the crypto market, the U.S. Department of Justice and the U.S. Securities and Exchange Commission (SEC) were investigating Signature Bank for potential money laundering related to cryptocurrency trading. In 2018, an article appeared in The New York Times about Signature Bank, which was considered a "home bank" for the Trump family, it funded Trump's golf course in Florida, and Trump's daughter Ivanka Trump was on Signature Bank's board of directors. Signature Bank also provided financial support for the re-election of a number of U.S. Senators for their support of the Economic Growth, Regulatory Relief and Consumer Protection Act.

The bank proved unable to close a deal to consolidate its finances on March 10-11, 2023 and to honour the avalanche of requests to withdraw deposits placed that weekend by customers. The same source speaks of the bank "*losing deposits so quickly that it was forced to ask for money twice from the Federal Home Loan Bank of New York in 90 minutes*." Government agencies viewed the bank's collapse as a systemic risk to the financial system, taking extraordinary measures to ensure the availability of funds beyond the FDIC-insured limit of $250,000, because by December 2022, 90% of Signature Bank's total deposits attracted of $89 billion exceeded the FDIC-insured maximum. New York state officials wanted to take over the institution on Friday, March 10, and have been pressuring the Treasury Department, Federal Reserve and FDIC to let them take control of the bank. On

March 19, the FDIC announced that certain deposits and loans and the 40 branches of Signature Bridge Bank had been taken over by New York Community Bancorp. The sale did not include about $60 billion in loans, which remained in receivership.

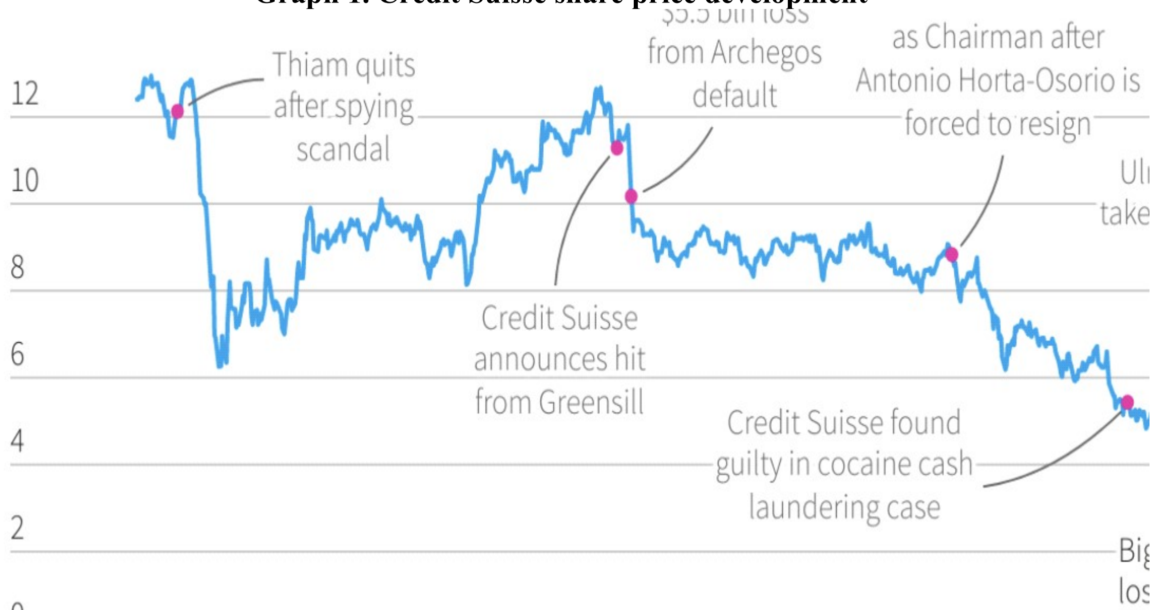
4. US regulators' response. In response to US bank failures (wikipedia.org, 2023), US regulators have announced extraordinary measures to ensure that all deposit withdrawal requests will be honoured. Thus, on 12 March, the Federal Reserve created a bank funding programme offering loans of up to one year to eligible depository institutions (banks, savings associations, credit unions and other depository institutions) against collateral consisting of eligible assets (US Treasury securities, securities issued by US government agencies, or mortgage-backed securities, with these securities being valued at face value rather than the lower current market value affected by interest rate increases starting in 2022). The Federal Reserve has also relaxed access to its lending window, and the Treasury Department has made $25 billion available to the bank financing program. Additionally, the facility through which the Fed provides liquidity to banks has been accessed by a significant number of banks, with $153 billion in loans (Cox, 2023).

At the same time, banking market regulators seem to be moving very quickly to implement measures to prevent such crises in the future. For example, the Federal Reserve has begun looking at introducing higher capital and liquidity requirements for credit institutions with assets between $100 billion and $250 billion. Moreover, the issue of regional banks in the US, under the supervision of state rather than federal agencies, has raised concerns about regional banks growing too quickly. Last but not least, the March 2023 banking crisis triggered a series of investigations by the U.S. Department of Justice and the U.S. Securities and Exchange Commission (SEC), the U.S. capital markets watchdog, into the Silicon Valley Bank executives' stock sales and the accuracy of the bank's published risk disclosures.

5. Interventions by US credit institutions. Also, during the banking panic of March 2023, commercial banks themselves stepped in to help those credit institutions that had liquidity problems. Thus, during the panic, between 8-12 March and after mid-March, there were significant interbank flows of funds to support the troubled banks. This appears to be a new feature for commercial bank behaviour during a crisis. Typically, in past banking crises, commercial banks avoided lending to those banks with liquidity problems to avoid potential losses in the event of the failure of the borrowing bank, but also to avoid contagion (rumours and declining public confidence if news of one bank's exposure to another in trouble reached the public, fuelling panic, increased demands for deposit withdrawals, and ultimately a run on deposits). On the contrary, since the financial crisis of 2007, but especially during the current crisis, banks panicked by widespread contagion are stepping in to support troubled banks by lending to them or opening up deposits, in a word providing them with liquidity, precisely to calm the markets, boost depositor confidence and ensure that stressed banks have the liquidity to meet deposit withdrawal requests.

6. The international impact of the crisis has been relatively modest. The main effects were the liquidation of a Swiss bank, Credit Suisse, the quasi-general fall in share prices of some banks and, to prevent international contamination of banks, industry regulators such as the Bank of Canada, the Bank of England, the Bank of Japan, the European Central Bank and the Swiss National Bank stepped in to provide liquidity to commercial banks.

Graph 1. Credit Suisse share price development



Source: Noele Illien, Oliver Hirt, Credit Suisse warns of more losses, drawing regulatory attention, 9.02.2023, www.reuters.com, https://www.reuters.com/business/finance/credit-suisse-logs-worst-annual-loss-since-global-financial-crisis-2023-02-09, (accessed 16 April 2023)

7. Credit Suisse collapse. On 19 March, Swiss bank UBS Group AG bought its smaller competitor Credit Suisse in an emergency arrangement brokered by the Swiss government. This was the most significant international event beyond US borders, partly caused by the US banking panic and heightening concerns about an international banking crisis. Yet the US panic only partly caused the closure of Credit Suisse. As early as February, i.e. some time before the US banking crisis, Credit Suisse had announced significant losses in 2022 (CHF 7.3 billion) due to deposit withdrawals. Illien, N., Hirt, O., (2023), note that these reached CHF 110 billion ($120 billion) in the fourth quarter of 2022, and the consequence was that the wave of outflows and the fall in the bank's share price continued during the first quarter of 2023, continuing the trend of the past two years.

Subsequently, on 14 March 2023, the bank's report noted significant deficiencies in financial reporting. The ominous information for the bank continued. On March 15, Saudi National Bank, Credit Suisse's largest shareholder, announced that it would not provide additional financial support, news that fuelled a further drop in the bank's shares. To halt the collapse, in the following days Credit Suisse attempted to take out a CHF 50 billion loan from the Swiss National Bank, then began buying back its own shares worth CHF 3 billion and selling assets (the Baur en Ville hotel in Zurich). But all this did nothing to improve investor and depositor confidence, with reports (wikipedia.org, 2023) of outflows of more than CHF 10 billion during that week and almost $69 billion (CHF 61 billion) in the first quarter of 2023. The Credit Suisse situation became so critical, and the problems could have spread to other banks, that the Swiss government and the Swiss National Bank almost forced UBS (Union Bank of Switzerland) to buy all Credit Suisse shares for $3.25 billion (CHF 3 billion). In post-factum analyses of the Credit Suisse collapse the fan of causes included US bank failures (as former bank chairman Axel Lehmann saw it), years of multi-billion dollar losses, scandals and its poor business strategy. It should also be noted that some analysts also

put the collapse of Credit Suisse on the economic sanctions imposed by Switzerland on Russian individuals and businesses as the bank held about $33 billion in resources from Russian clients (wikipedia.org, 2023).

8. Effects of the US banking panic of March 2023 on the banking industry in other countries. Among the effects of the US banking panic of March 2023 on the banking industry in other countries, the most relevant was the fall in bank share prices, caused by investors' fear of possible losses, which in fact means a fall in bank equity financing. For example:

- In Japan, the share values of the three major lenders, Mitsubishi UFJ Financial Group, Sumitomo Mitsui Financial Group and Mizuho Financial Group, lost between 10% and 12% due to market turmoil and their exposure to the bond market, and the Topix index calculated for listed Japanese banks fell 17%;
- The 5-year CDS (cost of default insurance) price for Deutsche Bank debt rose 70% on Friday, March 24, 2023, and Deutsche Bank shares fell more than 14% at one point, ending the day with a loss of about 8%;
- The UK banking index also fell by around 3%, following falls of around 6% for both Barclays and Standard Chartered and 4% for NatWest;
- Shares of some of Europe's leading banks, such as Commerzbank, Raiffeisen Bank and Société Générale also fell;
- Chinese banks have seen little negative impact, Bloomberg News, noting that the best performing banks during the banking market crisis were in China (wikipedia.org, 2023).

9. Possible international contagion. Another international effect of the US banking panic in March 2023 was the intervention of central banks in the markets to provide commercial banks with liquidity to prevent international contagion. Thus, the regulators that intervened or announced their intention to intervene to help commercial banks through any difficult times were the US Federal Reserve, the Bank of Canada, the Bank of England, the Bank of Japan, the European Central Bank and the Swiss National Bank. One issue that arose for central banks during the banking panic, struggling with widespread inflation, was whether to continue interest rate hike programmes, the main anti-inflationary weapon, or to pause interest rate hike programmes**.** The response was mixed, some, like the Central Bank of Japan, after a crisis meeting, decided to postpone the process, while the European Central Bank and other European central banks raised interest rates in the very same tense days of March 2023. Interest rate hike postponements have also been seen in the Central Bank of India, the Central Banks of Australia, Canada and Indonesia (wikipedia.org, 2023). It should also be recalled that in the European Union, finance ministers in the euro area have called on the European Commission to close loopholes in the provision of liquidity during crises and the insurance of bank deposits, a measure somewhat similar to that adopted in the US during the crisis, when the US authorities insured deposits beyond the legislative limit of $250 thousand and set up an emergency liquidity provision program for credit institutions.

10. Subsequent reverberations of the banking panic. After the March 2023 panic, shares of several US regional banks fell and depositors continued to move their deposits to larger banks. Problems were experienced by the following: First Republic, closed on May 1, Western Alliance Bancorporation, its share price down 47%, PacWest Bancorp, with a 21% lower share price, First Horizon, Metropolitan Bank and Western Alliance, and Moody's lowered credit ratings for several regional banks (Western Alliance, First Republic, Intrust Bank, Comerica, UMB Financial Corporation and Zions Bancorporation).

Against the backdrop of a relatively calm April 2023, on May 1, 2023 the US banking industry faced another collapse: First Republic Bank (FRB), a bank with assets worth $212 billion, collapsed on May 1, 2023. FRB's collapse began earlier, but visibly was on April 28,

when First Republic Bank announced its intention to sell, at a loss, some of the bonds and securities it held to raise liquidity. That same day, the FDIC announced that it was considering taking over the bank, which caused First Republic Bank's stock price to drop 43% to just $3.50. After falling another 42% in after-market trading, the FDIC confirmed the bank's takeover. The cumulative collapse in First Republic Bank's share price in 2023 was 97%. The next day, on April 29, the FDIC asked banks such as JPMorgan Chase, PNC and Bank of America to submit bids for the takeover of First Republic Bank by April 30, and on the morning of May 1, 2023, the California Department of Financial Protection and Innovation announced that FRB had been closed and its assets sold to JPMorgan for $10.6 billion (wikipedia.org, 2023). These were the final elements of the collapse, because the problems had arisen somewhat earlier, during the March 2023 banking panic, when two agencies, Fitch Ratings and S&P Global Ratings, downgraded First Republic's credit rating, the source indicated above citing as the reason for the two rating agencies' decision "*a large proportion of uninsured deposits*" for which there was a high probability of being withdrawn, a loan-to-deposit ratio of 111%, i.e. loans made by the bank exceeded deposits attracted. On March 16, 2023, 11 US banks, including JPMorgan Chase, Bank of America, Wells Fargo, Citigroup and Truist Financial, deposited $30 billion with the FRB to increase depositor confidence and avoid a run on deposits, as well as for the bank to cope with potential deposit withdrawal demands. Despite the money, investor confidence remained shaken and the bank's share price continued to fall. Three days later, on March 19, S&P downgraded its rating again, citing pessimism that the bank's problems could be remedied, according to the source quoted above. Ensign (2023) cited by the previous source, notes that FRB, had lost $104.5 billion in deposits during the crisis, a run caused by bank customers who had deposits of more than $250,000, unsecured by the FDIC. The bank's lack of liquidity was due to the fact that many of the bank's long-term investments were in municipal bonds, the price of which was falling (due to rising interest rates in the US market), and also because they could not be converted into cash through the long-term funding programme (an emergency bank lending programme initiated by the US authorities after the collapse of SVB) because they did not qualify as eligible collateral.

In May, the problems continued and for:

- PacWest Bank, with assets of $40 billion in 2021, whose shares fell sharply on May 3 after the bank announced it was considering a sale, and on May 4, trading in the stock was suspended as share prices continued to fall sharply. Wikipedia.org notes that PacWest Bank suffered a $6.7 billion deposit withdrawal through March 20, which subsequently increased by another $1.8 billion.

- First Horizons, with assets of $89 billion in 2022, whose shares began to fall after the merger with Toronto-Dominion Bank was cancelled, and also amid the collapse of First Republic Bank.

- Western Alliance Bancorporation, with assets of $67 billion in 2022, with a share price drop of 82%, before trading was halted.

- Valley National Bancorp, with assets of about $64 billion in 2022.

- Pacific Premier Bancorp, with assets of $21.6 billion in 2022.

- Citizens Business Bank, with assets of $14 billion in 2022.

From what has been described above, we can conclude that it was not a systemic crisis, but rather a banking panic, with the epicentre located, dominantly, in the USA, where the area of collapse included in the epicentre, in March, 3 banks (2 failed and one voluntarily liquidated), extended in May, also in the USA, to one more, modest in importance (in total, intermediated assets of approx. $550 billion, including the FRB), and the international impact of the panic was marginal, involving the takeover of a troubled Swiss bank (which rather

coincidentally collapsed during this period) and share price depreciations of some banks. Eloquent in appreciating the minor international impact of the March banking panic is the IMF's April 2023 forecast, so after the event, which lowered the outlook for global GDP growth by just 0.1%, from 2.9% to 2.8% (IMF, 2023), but announced its concerns about the stability of the financial system.

4. Particularities of the banking turmoil in March 2023

a. Information and social media. The key issue in deciphering the March 2023 banking panic is information and social media (Tett, 2023). During the 1997-1998 crisis there was little information, as with previous banking crises, the media community was isolated. The media, on the one hand, delivered little information to the public, because they had little access to it, the connection to the banks was rare, and behind-the-scenes information was inaccessible. On the other hand, the media of 25-30 years ago, technologically speaking, meant a time lag between when information was received and when it reached the public. In other words, already filtered information was slow or delayed in reaching the public. In addition, information had to be verified from several sources and rumours were not spread by the media. A decade later, during the global financial crisis of 2007-2008, there was more transparency. When banks like Northern Rock and Lehman Brothers failed, viewers could see the panic on their TV screens. The fear of losing money was transmitted from those already panic-stricken in the queue outside the bank, to those sitting in their armchairs in front of the TV who, thinking of the losses, perhaps put their clothes on and joined the crowd outside the bank. But the information continued to be insufficient. There was a lot of information that the public and the media didn't have access to, being open only to a limited segment of market professionals; it still couldn't be found freely, on the internet. For example, if you wanted to know the price of a credit default swap (or CDS, a financial product that essentially shows whether investors fear a bank is about to collapse), you had to call the bankers. Now, you have it all not "one click away", as one bank puts it, but in your pocket, where your smart phone is. And in your phone you have a whole host of apps, bringing information about financial markets near you at any time, you can watch live press conferences of bankers, with or without problems, theirs or the organisations they run, including monetary authorities or the opinions of specialists, the opinions of those like you, affected by the risks of certain banking investments, etc., quickly, in real time, when events take place. But all this, while making the financial consumer a very informed player, increases the risk of contagion, and fuels the panics sweeping the financial markets out of nowhere.

However, the banking markets are not transparent enough and the information is not complete, not all-inclusive. Perhaps, in the next financial crisis...what if banks displayed their deposit withdrawal volumes online and in real time?

Gillian Tett (2023) exemplifies the case of Silicon Valley Bank:

"A key moment in [the bank's] downfall occurred on Thursday, March 9, when CEO Greg Becker held a conference call with its largest investors and depositors. On social media the news spread quickly. "Greg told everyone that we shouldn't panic because the bank won't fail if we all stick together," said one of SVB's biggest depositors. To be sure, similar conversations had taken place in previous crises, but few customers knew about them. Not so in 2023. Reports of Becker's words leaked out on the internet, fuelling the run on bank deposits. Within hours, about $42 billion - or a quarter of SVB funds - were gone. In the 1984 banking crisis, by comparison, it took depositors a full week to withdraw half their funds from Continental Illinois when that lender failed."

From here the analysis has to bifurcate into two directions; the speed of the spread of information, the speed with which those affected act to protect themselves and the speed with which the authorities act to prevent panic and contagion in the markets.

b. Speed of information dissemination. "Cyber waves" are natively much faster. All it takes is for a certain piece of information or rumour to appear on social media, for it to be quickly rolled out, to pass quickly from one to another, to be enriched, adjusted or even transformed. Certainly the above information first affected Silicon Valley Bank depositors, because they were the subject, but the information also reached customers of other banks with vulnerabilities, validated by regular published or only suspected reports. So they quickly reached the depositors of Signature Bank, Silvergate Bank, First Republic, Credit Suisse, each of whom had been wrong: they had a high proportion of customers whose accounts exceeded the authorities' insured limit of $250.000, mismanaged interest rate risk, managed large portfolios of long-dated bonds whose price was falling, had large exposures in real estate that increased the risk of deposit run-off, or were scandal-plagued and poorly managed banks where depositors were already withdrawing their funds. Such contagion and deposit withdrawals had erupted before in financial crises, but the speed of contagion and deposit withdrawal was different from anything in the past. Now the accelerator had been information spreading at breakneck speed on social media and mobile banking services that speed up deposit transfers, leaving troubled banks without a response.

c. The speed with which those affected act to protect themselves. Traditionally, panicked depositors, frightened by the failure of a bank, go to the bank counters, stand in line so that maybe they will manage, before the collapse of the bank, to withdraw the money from their accounts. Fortunately for depositors, and unfortunately for banks, they are now permanently connected to their accounts, the computer, through Internet banking applications, and especially the mobile phone, which is always in the hand of each person and which we use several times a day, allows us to see our account situation quickly, and, additionally, to quickly save the deposits we have at a bank. All it takes is for one rumour to appear and, without having to go to the bank counter, we can liquidate our deposits quickly and transfer them to other, safer banks. Even if costs arise, we save the bulk of our liquidity. Previously, when depositors had to liquidate their deposits physically at the traditional counter, it was tied to working days and the daily schedule at the bank. Now, mobile banking or internet banking apps work 24 hours a day, seven days a week. No one is in front of us, the queue, where the depositor used to sit to withdraw their money, is gone. It's just them and the bank's computer. Fast, real-time, instant payment systems complete the process. The run on bank deposits is so fast that bank management is almost unable to carry out the process, and slow decision-making systems in banks react late. The lifeline almost disappears.

d. The speed with which authorities act to prevent panic and contagion in the markets. The same source (Gillian Tett, 2023) notes that "*SVB managers have asked the Federal Reserve (Fed) for help in meeting depositors' withdrawal requests. But unlike mobile banking, which operates 24/7, the Fed's facilities are open only a few hours a day*." So although, "*by Friday morning, a total of $100 billion was scheduled to go from the FED to the SVB*", the SVB was already dead. Overnight, when the saviour was asleep. Regulators reacted vigorously, with $100 billion, but their response was a 20th century classic. Regulators had forgotten about the Internet, mobile banking channels and the rapid spread of information on social media. A plea to regulators would be to move central bank processes into the 21st century and keep them operational 24/7 in a crisis. "Speed, in everything," says a frequent TV ad.

e. Culture and financial education. Two words about the bank customer of today: they are no longer the customer of a few decades ago, their financial culture is getting richer

by the minute. They are inundated with financial messages, trained to react to them and, more importantly, they have experience, a "banking history", as the banks say. They have a history, richer or poorer, of consuming banking products. And this is happening with more and more consumers of banking products. The ordinary person in the street, even if they have a modest income, is increasingly a consumer of banking products. It is part of 'financial inclusion', as the financial literature puts it. So they know how to select banking products, between those that have good or negative effects on their wealth, and they also know how to choose the periods of time when to use them. They're much more financially savvy, so they're a quick adopter of innovations (internet banking, mobile banking, payment apps, etc.), but their behaviour remains the same as it was in the past, they haven't changed much. They know that flight is healthy. So at the slightest foreboding bad rumour, they will quickly transfer their deposits to an alternative.

f. Another observation related to the March 2023 turmoil, but also to past banking crises, would be that regulators are not visionary enough, fail to monitor the present banking problem or the models used are not forward-looking enough. Regulators are sticking to the problems that arose during the last crisis. For example, the press in the weeks following the turmoil noted that stress tests of banks by the Fed in the run-up to the March 2023 banking panic used low interest rate scenarios and none examined the impact of large interest rate increases. That's because the previous financial boom of 2007-2008 left bankers worried about credit risk because of widespread mortgage defaults, the trigger for that crisis. This was the risk that regulators and bankers were monitoring before the March 2023 turmoil. In the global financial crisis of 2007-2008 it was similar. When bankers were asked after the crisis in 2008 why they had not monitored mortgage default risks in previous years, they said their risk managers were worried about hedge funds and corporate lending, because in the previous financial crisis, the 1998 crisis, it had all started with the implosion of a large hedge fund (Long-Term Capital Management) and the dotcom bubble, the first internet and online trading crisis, which broke out in 2000, had generated losses from bank lending to corporations. So the past is not always a good guide to future risks, and rules to fix the last crisis and create "safety" sometimes mean we miss new risks.

g. **From the analysis of the causes of the banking turmoil in March 2023, it also emerged that what is considered "safe" by theory or by regulators is not really very safe, and sometimes it can even be dangerous**. Gillian Tett (2023) recounts that, in the late 1990s, Japanese bankers were making real estate loans because they seemed "safer" than corporate loans, as house prices had always risen. Similarly, bankers affected by the 2008 financial crisis said that one of the reasons they ignored the dangers surrounding subprime mortgages was that these instruments had triple-A, very safe credit ratings, so risk managers paid little attention to them. The same was true of the March 2023 SVB turmoil. The trigger was the long-term Treasury bond portfolio, which was supposed to be the safest asset of all possible placements. So safe that regulators everywhere are encouraging (or perhaps better to call it, forcing) banks to buy them. Or, as Jamie Dimon, head of JPMorgan, noted in his annual shareholder letter, "*ironically, banks were encouraged to hold very safe government securities because they were considered very liquid by regulators and had very low capital requirements*" (Tett, 2023).

5. Conclusions

The bottom line is that there was no systemic banking crisis in March 2023. Rather, it was a banking panic, with the epicentre located, dominantly, in the USA, where the area of collapse included 3 banks at the epicentre in March (2 failed and one voluntarily liquidated), extended in May, also in the USA, to one more, modest in size (in total, they intermediated

assets of approx. $550 billion, including the FRB), and the international impact of the panic was marginal, involving the takeover of a troubled Swiss bank (which rather coincidentally collapsed during this period) and share price depreciations of some banks. Eloquent in appreciating the minor international impact of the March banking panic is the IMF's April 2023 forecast, so after the event, which lowered the outlook for global GDP growth by just 0.1%, from 2.9% to 2.8% (IMF, 2023), but announced its concerns about the stability of the financial system.

Regulators could also strengthen capital buffers, especially for smaller lenders, protect deposits more or make it harder to withdraw them at critical times for banks. More work could also be done on the transparency of information about banks, to counterbalance consumer reaction to news, especially fake news, which increases the risk of leaving the bank and leads to contagion.

After the turmoil erupted, policymakers in Washington said they would look into the causes that led to the March 2023 demise of US banks. This could mean forcing medium-sized US lenders to comply with Basel rules on bank capital. Officials also spoke of the need to reassess bank liquidity rules, which would mean new obligations for banks to be able to withstand deposit withdrawals much more quickly, as recent bank collapses have been driven by the high rate of flight of customer deposits in the digital age.

It is possible that in the coming years we will also see the regulation of digital deposit withdrawals from banks, as they are a risk factor for banking systems.

In the same context of reducing the new risks facing contemporary banks, stress tests on banks should address new themes such as the behaviour of bank customers, the degree of their digitalisation, the size of individual deposits and the extent to which they are insured, and explore measures to protect the system against them, although they acknowledged that this will be difficult.

At the same time, regulators and policymakers should be wary of the impact of interest rate risk on financial intermediaries when the impact comes through the bond portfolio channel, which has been shown in the recent turmoil to torpedo bank balance sheets and trigger runs on deposits. I believe that even the monetary policy authorities, when they decided to increase interest rates, at very high levels and, more importantly, in a very short timeframe, did not realise and did not consider the impact of their measure on banks. Government bonds and even treasury bills will certainly no longer be considered "safe" and low risk, and banks will almost certainly have to provision them.

But the solvency issue also applies to large banks with "international relevance" and "international assets", banks to which Basel III bank capital rules applied. This is because banks such as Silvergate, SVB, although not of "international relevance", could generate cross-border effects, their collapse had the potential to destabilise the financial system, causing collapses in the value of bank shares in many financial markets and numerous contagion concerns.

It should also be seen to what extent the deposit insurance limits of €100,000 in Europe and $250,000 in the US are still appropriate in the current situation, especially as Washington regulators, although not forcing all banks to adhere to Basel III bank capital rules (after 2018), in order to calm the markets and all collapsing bank depositors, have decided to guarantee all deposits, regardless of their value.

Finally, we would add that as early as March 2023, after the outbreak of the turmoil, the Basel Committee on Banking Supervision, which sets global banking regulatory standards, announced that it would examine whether additional rules are needed in the wake of recent banking collapses.

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