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The collapse of Silicon Valley Bank – The importance of proactive risk management in order to prevent financial contagion

Abstract

In the underlying paper, the collapse of Silicon Valley Bank (SVB) serves as a case study to explore the causes and the crash´s aftermath. The main question is, if the crash and its spill over effects could have been prevented. The study highlights the importance of effective risk management practices, diversification, and capital management for mitigating systemic risk in order to prevent financial contagion. The findings underscore the necessity of a robust regulatory framework, like the Dodd-Frank Act and Basel III, but also emphasize the importance of proactive risk management within banks to prevent future failures. The collapse of SVB reveals that despite regulatory measures, gaps in risk management practices can still lead to catastrophic consequences, emphasizing the need for continuous improvement in risk management strategies within the banking sector. The underlying research hypothesis is that the crash of SVB and its aftermath could have been prevented by adequate and prospective risk management.

Key words

Bank collapse, Silicon Valley Bank, risk management, banking risks, financial contagion, systemic risk, mitigation strategies, regulatory framework

JEL Classification

G01, G21, G24, G28, G33, G38

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Introduction

Like any other business, banks are exposed to various risks that can cause them to collapse. Credit risk is the risk that a borrower will fail to meet its obligations to repay its debt, resulting

in a loss for the lender (Leo et al., 2019). Liquidity risk is the risk that a bank will be unable to meet its financial obligations due to an inability to convert assets into cash (Leo et al. 2019; Nikolaou, 2009). Market risk is the risk that the value of a bank's assets will decline due to changes in market conditions (Leo et al., 2019). Operational risk is the risk of loss resulting from inadequate or failed internal processes, people, and systems (Leo et al., 2019; Basel Committee on Banking Supervision, 2011). Reputational risk is the risk of damage to a bank's reputation, which can lead to a loss of customers and revenues (Adeabah et al., 2022; Cummins et al., 2006).

The collapse of Lehman Brothers is a perfect example of how the failure of one bank can have significant ripple effects throughout the global financial system, highlighting the importance of effective risk management strategies and the need for a robust regulatory framework to ensure the stability of the banking sector (Feldkircher et al., 2014). In light of the devastating effects of the Lehman Brothers crash, the collapse of SVB also elicited strong concerns about systemic impacts among various stakeholders.

This paper is structured as follows. First, systemic risk and the phenomenon of financial contagion will be explained. Building on this background information, the focus of this paper will then be devoted to an analysis of the causes of SVBs' crash and its aftermath addressing the following core question:

What factors led to the crash of the Silicon Valley Bank, what implications did the collapse have in terms of financial contagion and could the underlying risks have been mitigated?

Following Bales and Burghof (2023), which summarize that the default of SVB was the result of an asset-liability mismatch caused by inappropriate risk management, the underlying research hypothesis of this paper is:

The collapse of Silicon Valley Bank and its aftermath could have been prevented by adequate and prospective risk management.

1 Systemic Risk & Financial Contagion: The Domino Effect in Banking

Systemic risk, often examined within the broader spectrum of financial contagion, is the potential for a specific disturbance or failure within an institution or market segment to incite substantial instability or collapse in the larger financial system or the entire economy (Acharya et al., 2016). A significant factor contributing to systemic risk is the interconnectedness of institutions and markets; the dense web of financial systems means that the downfall of one entity can catalyze a domino effect, causing a ripple of failures across

interconnected institutions (Gai et al., 2011). Alle & Gale (2000) explain that financial contagion is a phenomenon closely tied to systemic risk and refers to situations where panic or failures in one financial institution or market extend to other institutions or markets, even without direct financial ties. Such contagion can be accelerated by vulnerabilities in financial infrastructure, including payment systems or clearing houses, as these can channel disruptions across the financial landscape (Bernanke, 2010). Brunnermeier et. al (2009) explain that furthermore, macroeconomic shocks, which are large, unforeseen economic events, can intensify these disruptions, leading to a more widespread financial system instability.

1.1 Financial Contagion: Term and Causes

Rose and Spiegel (2010) argue that there is disagreement in academic discourse about whether economies can "contagion" from crises originating elsewhere, or whether international or even global crises are not rather common shocks affecting different economies to different degrees. Moser (2003) points out that even though financial crises may occur at the same time in different countries, it can be coincidence rather than cause-and-effect. This means that concluding contagion would be a misperception. Moser also states that a causal connection is required for contagion. Financial contagion is the case when the cause for the shock is common. On the other hand, he argues that it is debatable whether a transmission of country-specific shocks should be considered contagion since interdependence between countries results in particular from the interconnectedness of the economic indicators of their payment balances, thus a financial crisis in one country can affect the economy of another (e.g. trade shocks). It can be concluded that one must distinguish between contagion and interdependence between countries.

Rose and Spiegel (2010) who investigated the cross country causes of the financial crisis in 2008 state that there is a contagious response when it comes to real and financial crises. According to Bayona and Peia (2022) contagion can take place between countries, markets and asset classes both in situations in which fundamentals are related, through trade or linkages in the financial sector, and unrelated, trough the actions of investors. Regarding the situations in which fundamentals are related, Rose and Spiegel (2010) state that there are three main distribution channels through which crises can spread: international trade relations, foreign asset exposure, and sudden stops in international credit.

Nowadays, it is widely recognized that financial linkages across countries were critical to the rapid transmission of the crisis across national borders, which led to a reevaluation of the effects of international market integration – previously assumed to diversify risk but

today also considered to amplify the international spread of crises (Devevereux & Yu 2020). This is in line with the results of the literature review of Tafakori et al. (2022) which showed that interdependencies between financial institutions and financial markets are considered as a main cause for contagion.

As Bayona and Peia (2022) state contagion can also occur by certain investor behavior. They argue that financial crises are often a self-fulfilling prophecy since investors who are convinced that a crisis will arise, will retract their investments because they expect that other investors will do the same. This argument is inspired by the “animal spirits” theory. De Grauwe (2008) describes the concept of "animal spirits" introduced by Keynes as a form of self-fulfilling prophecy expected by investors and consumers. The underlying concept is that consumers and investors adjust their investment behavior depending on their expectations of the future, which then actually affects the market. Since the crash of the SVB lead to panic on the markets, a similar behavior could be observed.

2 Silicon Valley Bank Collapse: Case Study

2.1 Causes of Silicon Valley Bank’s collapse

The default of Silicon Valley Bank was a significant event in the banking industry, and it was the result of several factors. This section focusses on an analysis of the bank’s financial performance from 2019 to 2022 conducted by the authors Vo and Le (2023), while deriving the key reasons behind SVBs’ failure. It also examines the bank's performance ratios during the same period to provide insights into its business model and practices.

One of the main reasons of the bank's downfall was its substantial investment in debt securities during a period of low-interest rates. SVB heavily allocated its investments to securities, particularly debt securities, which are highly sensitive to interest rate fluctuations (Vo & Le, 2023). The downfall of SVB can be traced back to its substantial investment portfolio, valued at USD 120 billion (bn), which primarily consisted of long-dated mortgage-backed securities (MBS) issued by US government agencies (Hauf & Posth, 2023). By acquiring a substantial MBS portfolio at a historically low yield-to-maturity of around 1.64% in 2020 and opting not to sufficiently hedge it, the bank's management not only exposed itself to significant interest rate risk but also recorded a return on capital that is significantly below present-day levels (ibid.). As interest rates increased, the value of these securities declined, resulting in substantial unrealized losses. The bank's low reliance on equity capital also exacerbated this situation, as it did not have sufficient capital to absorb these losses (Vo

& Le, 2023). Barr (2023) states that although the immediate reason for SVB's collapse was a liquidity run, the fundamental problem stemmed from doubts regarding its financial viability.

The bank's lack of depositor diversification was another crucial factor that led to its collapse. The bank's deposit base was heavily concentrated among a small group of depositors from venture capital and tech industry, amplifying the risk of a bank run (Barr, 2023; Politi & Fedor, 2023). This concentration of deposits also limited the bank's ability to attract new customers, reducing its ability to diversify its funding sources and increase its resilience to shocks (Vo & Le, 2023). It can be concluded that SVB's significant investment in debt securities and its concentrated deposit base, along with a lack of depositor diversification, played pivotal roles in the bank's downfall, highlighting the critical importance of risk management and financial stability in the banking sector.

Furthermore, the bank's business model heavily emphasized securities, leading to a decline in its loan portfolio. The proportion of net loans and leases to total assets significantly decreased from 46.96% to 35.22% during the analyzed period, substantially deviating from the industry average. Consequently, the bank's loss provision for loans and leases, as well as net charge-offs for loans and leases, were significantly lower than industry benchmarks (Vo & Le, 2023). This lack of focus on loans and leases, which are typically considered lower risk than securities, also contributed to the bank's vulnerability to interest rate fluctuations.

The bank's low proportion of loans and leases also impacted its net interest margin, which decreased from 3.53% to 2.23% during the period (Vo & Le, 2023). This figure fell below the industry average, attributable to the bank's heavy investments in securities and limited proportion of loans and leases (ibid.). Additionally, the yield on earning assets declined from 3.83% to 2.77% (ibid.). Concurrently, the cost of funding earning assets escalated from 0.30% to 0.53%.

The bank's return on assets and return on equity also declined during the period. Return on assets shrunk from 1.65% to 0.96%, while return on equity decreased from 21.47% to 13.43%. In 2022, SVB's return on assets significantly lagged behind the industry average, while its return on equity outperformed it. This suggests that the bank used less equity capital than the industry average (Vo & Le, 2023).

Despite SVB's relatively low equity capital ratio, its total risk-based capital exceeded the industry average significantly. This can be attributed to the bank's lower credit risk stemming from a higher proportion of U.S. government securities and a lower proportion of loans and leases. Furthermore, the bank maintained assets with low credit risks, resulting

in its classification as "well capitalized" by U.S. banking regulators for several years (Vo & Le, 2023).

Additionaly, the authors Bales and Burghof (2023) postulate, that the collapse of SVB was boosted by public attention. The authors analyze the relationship between public attention and trading activity of Silicon Valley Bank (SVB) stock during its default in March 2023. By analyzing tweets and Google searches, the researchers demonstrate that public attention significantly influenced the crash dynamics and contributed to reduced market excess returns for SVB. Their research highlights the significance of social media in maintaining financial stability and provides empirical evidence supporting the occurrence of bank runs driven by media attention (Bales & Burghof, 2023). This is also confirmed by Barr (2023), who emphasized the possibility of depositors to instantly spread their concerns about a bank run and herby accelerate the possibility of its occurrence.

In conclusion, a combination of factors, including SVB's significant investments in debt securities, concentrated deposit base, reduced focus on loans, and amplified media attention, played crucial roles in the bank's collapse. While the bank was classified as "well capitalized" by U.S. banking regulators, it ultimately failed due to its vulnerability to market fluctuations. As a result of these factors, investor confidence eroded, resulting in underperforming share prices and the bank's failure.

2.2 The Aftermath of the Collapse

Following the collapse, the academic and financial spheres witnessed a surge in research endeavors focused on understanding the aftermath and the intricate mechanisms of financial contagion that ensued. In this section, we will delve into a comprehensive literature review, drawing from a diverse array of studies.

Akhtaruzzaman and colleagues (2023) conducted a study to determine whether the SVB collapse triggered financial contagion. Their research shows that the SVB crash caused a significant increase in dynamic conditional correlations (DCCs) between the returns of banks in the US, France, Germany, Italy, and the UK which shows that the financial problems spread beyond just the US market and affected these European countries as well. DCCs between US and Brazilian bank returns also increased during the crisis, but surprisingly there was no significant increase in DCCs between the US and banks in China, India, or South Africa during the SVB crisis. They conclude that the European banking industry was greatly affected by SVB's failure, as seen in the takeover of Credit Suisse and First Republic Bank.

The researchers point out that contagion was significant within the banking industry but that it luckily only had minimal impact on other market sectors.

When it comes to the impact on markets, Yousaf et al (2023) state that the SVB collapse had a significant negative impact on some markets like U.S. stocks, global banks, Bitcoin, and equities in the Gulf Cooperation Council (GCC) region. However, it didn't have much impact on most traditional currencies, metals, and energy markets which suggests that the SVB event had a major effect but was limited to a small number of markets and didn't affect many others.

Aharon et al. (2023) confirm the findings of Yousaf et. al since they state that markets reacted negatively to the SVB collapse. They point out that specifically on capital markets in Europe, Latin America, and the Middle East and Africa a significant negative response was detected. The researchers emphasize based on their findings that companies and investors should pay close attention to systemic risk since financial markets are highly interconnected.

Chobi et al. (2023) observed the contagion effects of the Silicon Valley bank run and investigated factors contributing to declines in banks' stock returns after the Silicon Valley Bank (SVB) failure. Their findings show that mid-sized banks faced more stress, but that negative effects spread to most banks, except for the largest ones. The researchers point out that holding liquid assets like cash and high-quality securities or relying more on deposits than wholesale funding doesn’t always prevent bank runs like the SVB failure showed. The panic started when depositors got worried about unrealized losses in SVB's high-quality securities, even though they were of good quality. As described earlier, therefore, the banks had to sell these securities, which led to actual losses and made the situation worse. The researchers also found out that banks whose stocks did poorly after SVB's failure had already underperformed in the previous year. This suggests that investors anticipated the problems linked to relying on uninsured deposits during interest rate hikes but didn't foresee the issues with unrealized securities losses until the SVB crisis, even though the data was available which shows the challenges in creating comprehensive and robust stress scenarios.

Martins (2023) examined the effects of the collapse of the SVB and the credit Suisse on the stock market. He states that stocks of banks tend to go down when two banks fail. This can be explained by the fact that other banks get worried, people panic, and there's a lack of clear information. Martins explains that whether the stock price drops a lot or a little depends on factors like how easily the bank can access cash, how much they make from interest, how much risk they're willing to take, how well they operate, and who owns their stock.

In the conducted study, Martins investigated how the stock market responded when two banks, SVB and CS, failed among the top 100 European banks. He explains that recent studies also examined the impact of SVB's failure on global stock markets and that the result was, that the SVB's collapse had a significant negative effect on various market indices worldwide. It was also found that social media and herd behavior intensified the SVB crisis, since many tweets and Google searches contributed to the bank's problems.

3 Discussion

Bales and Burghof (2023) summarize that the default of SVB was primarily the result of an asset-liability mismatch which was caused by inappropriate risk management and the special characteristics of its depositors.

Following the statement of Bales and Burghof (2023), one could argue that the collapse of Silicon Valley Bank could have been prevented if the bank had implemented more effective risk management practices. Indeed, the bank's heavy investment in debt securities during a period of low interest rates was a significant risk factor that could have been managed through diversification and more conservative investment strategies. Additionally, the bank's lack of depositor diversification left it vulnerable to a bank run, and its low proportion of loans and leases made it more susceptible to interest rate fluctuations.

One of the main issues with SVB's risk management was its overreliance on securities, which caused a decline in its loan portfolio. This lack of focus on loans and leases, which are typically lower risk than securities, ultimately contributed to the bank's vulnerability to interest rate fluctuations. This could have been mitigated through a more balanced investment portfolio that included a greater proportion of loans and leases.

SVB's low reliance on equity capital also exacerbated its risk exposure. The bank did not have sufficient capital to absorb losses when its debt securities declined in value, which ultimately led to its collapse. This situation could have been improved if the bank had maintained a higher level of equity capital, allowing it to weather market fluctuations and economic shocks.

The bank's lack of depositor diversification was another significant risk factor that could have been managed through better risk management practices. If the bank had diversified its deposit base, it could have reduced the risk of a bank run and improved its ability to attract new customers. This would have increased its resilience to market shocks and reduced the impact of potential loss events.

The collapse of Silicon Valley Bank raises questions about the effectiveness of Basel III and other banking regulations (Hauf & Posth, 2023). Despite these regulations, the collapse of SVB suggests that there are still gaps in the risk management practices of banks. The heavy investment in debt securities during a period of low-interest rates and the lack of depositor diversification were significant risk factors that could have been mitigated with stronger risk management practices. These practices could have included more diversified investments, better capital management, and more stringent risk controls.

Despite that, regulations such as Basel III are not designed to eliminate all risks in the banking sector. They are intended to reduce the probability and impact of a crisis. In the case of SVB, it is possible that the bank's management did not adequately implement or adhere to the regulations, leading to its collapse. This means that regulations such as Basel III aim to improve the resilience and risk management practices of banks, but do not guarantee that financial institutions will not fail. It is essential for banks to have robust risk management practices in place to identify and mitigate potential risks, even in the presence of regulations. Furthermore, effective implementation and adherence to regulations are critical to their success in reducing systemic risks in the banking sector.

For preventing financial contagion, exogenous international cooperation is named as a key factor in avoiding financial contagion by Sáez & Shi (2004). In their findings, the researchers determined that indirect interconnections between banks, with liquidity loan decisions dependent on the presence of a liquidity pool, can lead to effective risk sharing and prevention of financial contagion. The liquidity pool acts as a mediator, ensuring consistent liquidity demand and shielding affected regions from others. Although the liquidity pool can be centralized in a designated money center, as referred to here, this arrangement may be constrained by the nature of deposits. One of the crucial components of a banking safety net, as per their statement, is likely the proficient and prompt regulation of bank insolvencies. However, they point out that banks can become exposed to the risk of bank runs through this mechanism of risk sharing, which can escalate into bank panics as financial contagion spreads, creating a domino effect (Sáez & Shi 2004).

Castiglionessi (2007) states that central banks achieve optimal allocation and prevent contagion by imposing reserve requirements on the amount of deposits obtained from commercial banks.

Gavin and Hausmann (1999) state that banks in economy who face a higher volatility should require higher capital ratios. They also found out that the geographical diversity of internationally active banks makes them more resilient to macroeconomic and financial

shocks specific to individual countries, thereby enhancing their overall robustness. In order to promote confidence, they recommend elevating bank disclosure standards and collaborating with the private sector to enhance accounting norms in order to facilitate transparency. Besides that the state that, establishing sufficient safety nets can alleviate concerns among small depositors regarding the security of their deposits and reduce the likelihood of them fleeing due to unfounded fears or baseless rumors.

It can be said that preventing financial contagion is a complex and that the contagion can only be prevented by prevention at international, micro and macro level.

Conclusion

In conclusion, the collapse of Silicon Valley Bank can be attributed to a combination of factors, including its heavy investment in debt securities, low reliance on equity capital, lack of depositor diversification, and low proportion of loans and leases. These weaknesses in risk management practices left the bank vulnerable to market fluctuations and loss events.

Regarding its aftermath the examined studies collectively highlight that the SVB's collapse had significant but relatively narrow impacts on financial markets. Stock markets, in general, reacted negatively to the event, with U.S. equities, global banks, Bitcoin, and equities in regions like Europe, Latin America, and the Middle East and Africa experiencing substantial negative responses. However, this negative effect did not extend to most traditional currencies, metals, and energy markets, indicating that the SVB's impact was largely confined to a specific set of markets.

Factors contributing to stock declines after the SVB failure included concerns about unrealized losses in high-quality securities, as well as bank-specific vulnerabilities related to access to cash, interest income, risk tolerance, operational efficiency, and ownership structure. It was also observed that investors anticipated some risks, such as those associated with uninsured deposits during interest rate hikes, but failed to foresee the implications of unrealized securities losses.

The analysis highlights the need for stronger risk management practices in the banking industry, despite the implementation of regulations such as Basel III. While regulations aim to improve the resilience of banks, they do not guarantee immunity from failure. The case of SVB emphasizes the importance of monitoring systemic risk, as financial markets are highly interconnected. The interconnectedness of markets suggests that even though investors typically diversify their portfolios, the effectiveness of risk reduction may be limited in the face of a significant event like the SVB collapse.

The collapse of SVB serves as a lesson for other banks to strengthen their risk management practices. It underscores the importance of comprehensive risk assessment, prudent investment strategies, and adequate capitalization. Banks should continuously monitor and evaluate their risk exposure, adapt to changing market conditions, and prioritize a customer-centric approach to foster long-term stability and sustainability.

While regulations such as Basel III play a crucial role in promoting stability in the banking sector, it is imperative for banks to go beyond regulatory compliance and proactively identify and address potential risks. By doing so, banks can enhance their resilience and mitigate the likelihood and impact of financial crises.

To sum it all up, the main result regarding the underlying research hypothesis is, that the crash of Silicon Valley Bank could indeed have been prevented by adequate and prospective risk management. Nevertheless, given the fact that SVB collapsed financial contagion cannot be avoided on an institutional level alone but on an international and mainly regulatory level.

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