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Risk Assessment of Banks under Fed Rate Hikes

Xiatong Li[1,a,*]

[1]*Business School, Monash University, Melbourne, VIC 3800, Australia*
a. Xlii0385@student.monash.edu
**corresponding author*

Abstract: The global economy was hit after the start of the COVID-19 pandemic. Economic stagnation and high volatility in commodity prices also had a negative impact on global supply chains. The Federal Reserve, in an effort to prevent a repeat of the 2008 financial crisis, slow down inflation, increase the liquidity of money, prevent asset value bubbles, and further revive and stabilize the economy, adopted a policy of raising interest rates, gradually increasing the federal funds rate to between 5.25 and 5.5 per cent over a two-year period. This change, however, also led to many changes in the banking sector. Commercial banks are trying to find ways to avoid risks while maintaining their returns in the face of financial market changes. This paper analyzes the systemic risk of commercial banks through liquidity risk, credit risk and market risk with the cases of Silicon Valley Bank, Signature Bank and Credit Suisse Bank. Through the analysis, this paper finds that commercial banks suffer from systemic risk, often reflecting their own operational problems, which ultimately led to bankruptcy or acquisition of the end.

Keywords: Banks and Financial Institutions, Fed Rate Hikes, COVID-19 Crisis

1. Introduction

Schwarcz points out that systemic risk was taken seriously by countries and financial institutions around the world in the aftermath of the financial crisis [1]. Central banks were concerned about the impact of systemic risk. After systemic risk began to emerge, the US government intervened and joined forces with a number of organizations to prevent systemic risk from emerging. Three factors were identified that could lead to the emergence of systemic risk, namely, time, a moderate economy and defaults by market participants. The brunt of the financial crisis was the subprime mortgage crisis, which further made the risks difficult to estimate as financial institutions issued too many subprime mortgages, which were packaged in a variety of financial instruments. In addition, the false prosperity of real estate also allowed many buyers to scramble for loans, and regulators failed to effectively and promptly monitor and stop irregularities in the financial market. Many factors were interlinked, and a break in the chain plunged the entire financial market into an unprecedented crisis. The financial crisis of 2008 is regarded as a classic example of systemic risk.

Cachanosky, et al. assess the Federal Reserve's actions in the aftermath of the COVID-19 pandemic [2]. New money loans introduced from 2020. Initially the U.S. government chose to allow people to live at home, and then eventually lifted this decree. Such changes led to a drop in productivity but little change in the cost of material and human resources. And the Federal Reserve chose to stabilize the currency to ensure demand. This is also to prevent a repeat of the financial crisis.

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According to the data published on the Fed's website, in March 2022, the Fed raised the federal funds rate for the first time since the epidemic by 25 basis points to 0.25 to 0.5 per cent, and then again every one to two months for the next year, with the number of hikes in 2022 standing at seven. And rate hikes still continue in 2023, with four increases. As of January 2024 the target range for the federal funds rate has remained between 5.25 per cent and 5.5 per cent. The main purpose of the Fed's rate hikes is to curb inflation and ensure that credit markets do not trigger liquidity risks. But this has had a greater impact on banks. The interest rate hike makes the cost of financing rise, the number of people taking out loans decreases, and competition among banks is further intensified.

One of the more typical, by the Federal Reserve interest rate hike impact on the bank is the Silicon Valley Bank and Signature Bank, etc., and the Silicon Valley Bank also in the Federal Reserve interest rate hike is difficult to adjust the response in time, ultimately leading to the bankruptcy. This also makes people not to reflect on whether the new systemic risk will appear again. Based on the 2008 financial crisis, Lehman Brothers bankruptcy, and the recent Silicon Valley Bank bankruptcy, it is not difficult to find that when the banking system all appear one or several risk problems, it may cause the emergence of systemic risk. Therefore, this paper focuses on assessing the risk management of banks in the wake of the COVID-19 pandemic, and will analyze liquidity risk, lending risk and market risk to develop relevant analyses, and combined with the systemic risk of the future Federal Reserve whether to raise interest rates to develop certain associations.

2. Liquidity Risk

In the wake of the New Crown Epidemic, financial markets around the world were generally depressed, and many tech companies grew well after the Epidemic and managed to raise money, much of which was deposited in commercial banks like Silicon Valley Bank, which then purchased U.S. Treasuries as a way of mitigating risk. The Federal Reserve then chose to raise interest rates sharply to curb inflation. This move caused the market to panic, and tech companies withdrew large sums of money from their banks, leaving many commercial banks exposed to sudden liquidity risk. Treasuries held by Silicon Valley banks rapidly depreciated in value with the constant rate hikes. However, on 8 March 2023, Silicon Valley Bank publicly sold off a large number of its assets and offered new equity investments and convertible bonds. This move led to a run on depositors who requested withdrawals totaling $42 billion, and on 10 March, Silicon Valley filed for bankruptcy due to insolvency. Al-Sowaidi and Faour attribute Silicon Valley's bankruptcy to four factors: managerial failures, supervisory failures, risk management, and diversity of investment strategies [3]. After analyzing the bankruptcy of Silicon Valley Bank, they conclude that investment strategies should be diversified, and regulators need to issue early warnings when danger is detected, rather than ignoring the risks due to negligence. Hauf and Postha analyze the interest rate risk of Silicon Valley Bank was higher than expected before the bank's failure through the dimensions of regulation and risk control, and point out that the relevant regulators in the United States are not sensitive enough to liquidity risk and have not been able to deal with the risk of liquidity risk [4]. Liquidity risk were not sensitive and accurate enough.

On 12 March, Signature Bank of America was also closed by the New York State banking regulator and declared bankruptcy. The reason was also precisely that depositors triggered a run on the bank due to the news of the Silicon Valley bank's bankruptcy, withdrawing more than $10 billion in cumulative deposits. the FDIC's review report showed that the Federal Reserve's interest rate hike also greatly affected Signature Bank, with deposits dropping sharply. Signature bank insolvencies are caused by the placement of large deposits in more liquid, lower-income, higher long-term assets, and a larger share of uninsured deposits. This behavior often triggers a run on the bank. In addition, it finds that signature banks lacked FDIC supervision. The report clearly identifies gaps in FDIC supervision of signature banks due to staffing shortages. However, the signatory banks have not

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responded in a timely manner to the FDIC's recommendations. The commercial banks, represented by these two banks, are facing a run, which has triggered a panic among the mid-sized banks, and it emphasizes that long-term holdings of risky funds may threaten the bank's capital assets. The reasons for this were massive capital shortages that made the entire banking system vulnerable, as well as problems with regulation that were not sufficiently addressed by the changes made in the wake of the financial crisis.2023 The panic led the Federal Reserve to take emergency measures to protect all depositors of the two failed banks and to encourage uninsured depositors at other commercial banks not to worry unduly.2024 The Federal Reserve has also taken a number of steps to protect depositors at other commercial banks from excessive liquidity risks. The fact that the Fed will continue to act riskily in the midst of possible future liquidity risks is the fundamental reason why the Fed faces a trade-off between mitigating and preventing crises and needs to do so. Choi, et al. estimate, through Silicon Valley Bank's December 2022 regulatory filings, that more than 85% of the bank's deposits are uninsured, which leaves the bank exposed to the risk of losing its depositors [5]. Subsequently, in the face of the Federal Reserve beginning to raise interest rates and significant losses in its bond portfolio, Silicon Valley Bank had to liquidate its held-to-maturity investment assets and incurred $1.8 billion in losses as a result. This demonstrated that banks were under extreme liquidity pressure and were unable to meet the withdrawal needs of depositors. The lack of adequate liquidity support in the face of interest rate volatility and changes in asset structure led to severe liquidity risk and ultimately to the failure of the bank. Huynh argues that competition may increase a bank's funding liquidity risk, and that competition metrics such as Boone's index and concentration ratios are found to be positively correlated with liquidity risk [6]. Second, large banks may be in a better position to mitigate the effects of competition on funding liquidity risk. Banks may be more likely to increase their funding liquidity risk during health crises such as the financial crisis and the NCCP epidemic [7]. In unfavorable macroeconomic conditions, banks' exposure to funding liquidity risk may be exacerbated.

3. Credit Risk

The main reason for credit risk is that customers who have taken out loans have difficulty in repaying them on time given their financial constraints. When these enterprises and individuals who have difficulty in repaying their loans accumulate to a certain number, the commercial bank's earnings risk gradually increases and eventually evolves into credit risk. Because commercial banks have a relatively lower threshold than other borrowing and financing channels, they often become the first choice of many enterprises and individuals. However, commercial banks must also carefully vet the qualifications of different customers before borrowing, but even so, credit risk does occur from time to time. Koulouridi, et al. point out in their paper that the epidemic led to a worldwide embargo and the temporary closure of businesses, which triggered a sharp decline in economic activity [8]. This economic stagnation has made it difficult for many households and firms to service their debts, increasing the likelihood of non-performing loans in bank assets and making economic stagnation a source of increased credit risk. In addition, the contraction of GDP in the Eurozone and the United States has been accompanied by an outbreak of mass unemployment. Economic contraction is usually accompanied by a decline in corporate profits and a deterioration in the job market, which in turn leads to a decline in the ability of individuals and corporations to repay their debts, thus increasing the risk of credit defaults. As for bank capital pressures and expected losses, large U.S. banks could face worst-case scenarios of epidemic-related loan losses and the potential for these losses to push banks to minimum capital levels. Banks face significant capital pressures and need to cope with potentially large credit losses. Finally, leading banks are accelerating their digital transformation to enable real-time monitoring and effective mining of transactional data while automatically correlating

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the results for decision-making. This reflects the fact that in the current environment, banks recognize that data and analytics capabilities are critical to assessing credit risk and making decisions.

On 20 March 2023, UBS eventually acquired Credit Suisse for $3.2 billion. Since the beginning of 2019, Credit Suisse Bank's NAV has shown an uncontrollable decline. 2020 had been exposed to scandals such as lack of risk control mechanisms, significant operating losses, and regulatory penalties. 2021 saw a loss of at least $8 billion. 2022 also saw a full-year loss of $8 billion. 2023 saw a delay in releasing the 2022 financial results, which was further compounded by the auditor, PricewaterhouseCoopers, which was cited in its audit report citing material weaknesses. Starting in 2019, Credit Suisse's loan loss provision is approaching fast 300%. The highly leveraged and more concentrated businesses that Credit Suisse Bank works with are in poor financial condition due to the New Crown epidemic and are struggling to repay their loans. Worse still, the value of the assets pledged by the companies also fell rapidly, and it was difficult to recover the losses by liquidating them, and the credit crisis facing Credit Suisse reached an unprecedented level.

Rossi analyses the main causes of the Credit Suisse crisis and its impact on financial institutions and the economic system as a whole, and proposes some solutions and considerations for the current financial market regulations [9]. The first is the improper use of credit lines. The origins of the Crédit Suisse crisis can be traced back to the bank's credit lines that it considered profitable, especially in terms of speculation, and unrelated to the amount of pre-existing savings. This demonstrated the risk appetite and misbehavior of the bank in its credit decisions, which could have led to a build-up of credit risk. A solution of monetary structural reform is proposed, aimed at preventing the possibility of banks opening credit lines for non-GDP transactions without sufficient funds to finance them. This demonstrates the need for measures to prevent the recurrence of similar credit crises and provides recommendations to improve the health of financial markets. Also, capital requirements and regulatory complexity. The idea that increasing minimum capital requirements may reduce the complexity of actual bank regulation. However, challenges remain for assessing the risks associated with different classes of financial assets, especially given the opaque nature of these activities and the multiple layers involved. This points to the need for a trade-off between risk and complexity in financial regulation and suggests further considerations for regulatory policy. Huynh finds that banks that have better returns and take on less credit risk are generally less affected by competition [6]. This suggests that the performance and size of banks may affect their sensitivity to changes in the competitive environment.

4. Market Risk

Commercial banks are mainly affected by prices and markets, and the market risks they face include interest rate risk and exchange rate risk, among others. Interest rate risk is often affected by interest rates and involves a number of businesses such as deposits, loans and investments. Market interest rates are positively related to the bank's earnings and negatively related to the bank's liabilities. Exchange rate risk, on the other hand, is due to fluctuations in the exchange rate affecting the balance sheet of commercial banks, involving their foreign exchange, cross-border trade and other businesses. Exchange rates often do not change at the will of commercial banks, so they need to be monitored in real time and market risk can be minimized. At the same time, the risk can also be reduced through risk control and amount limits. With the development of technology and the progress of the times, more and more diversified markets also give rise to more business and greater market risk. In the past, the business of commercial banks mainly consisted of deposits and withdrawals, loans, etc., and the interest rate risk was relatively higher. It is mainly because the market interest rate affects the profit of commercial banks. But along with the accelerated process of economic globalization, international business transactions have gradually increased, and the exchange rate risk has also increased. The popularity of the Internet, on the one hand, has made cross-border and deposit/withdrawal

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transactions more convenient while at the same time bringing about fluctuations in market risk. Savvides and Savvidou aimed to investigate the market risk disclosure practices of banks of different countries and sizes, generating qualitative and quantitative indicators through content analysis and statistical techniques (e.g., regression and correlation analyses) in order to determine whether there are any differences among these banks [10]. The results show that there are significant differences between banks in different countries, with banks in the UK and the US in particular performing better in terms of overall risk reporting. Banks that performed well in reporting qualitative information tended to also perform well in reporting quantitative information on risk types. In addition, OLS regression and correlation analyses found that bank size (measured by market capitalization) was positively associated with the level of risk reporting. Despite the fact that banks have invested heavily in market risk, there are still significant differences in the level of disclosure and the overall level of disclosure is not yet at the desired level. This has important implications for bank regulators, accounting standard setters and academics as it provides empirical evidence to assess banks' disclosure practices and indicates the existence of risk types for which disclosure information is not yet adequate. In addition, the study points out that banks may be reluctant to fully disclose information due to considerations of confidentiality, competition or managerial weaknesses, which also deserves further attention and research.

The government's macro-controls may also greatly affect the market risk of commercial banks. Since the COVID-19 pandemic, inflation in the United States has been difficult to suppress, and the Federal Reserve's interest rate hikes have put all commercial banks associated with the US dollar on edge. The interest rate hike can certainly attract more users to buy treasury bonds, but the majority of commercial banks holding treasury bonds before the interest rate hike into the crisis, the interest rate risk has also been raised to an unprecedented height. In addition, the successive bankruptcies of Silicon Valley Bank and Signature Bank in the United States, and the acquisition of Credit Suisse Bank in Europe by its former competitor, UBS, are closely related to market risk. When depositors learnt that the bank was in crisis and took out all their deposits because of panic, this was also not only a withdrawal of liquidity risk, but also one of the manifestations of market risk.

Based on this, the commercial bank's control of market risk is particularly important. First of all, commercial banks should be able to effectively control market risk. Both need to comply with the relevant rules and regulations, very likely to avoid the loss caused by the risk. In the real-time changes in the market, to be able to constantly improve the use of appropriate models or tools to assist commercial banks to avoid risk. Predicting and preventing market risks as early as possible before they come, even if they really encounter risks, they can calmly take the most effective means to prevent further expansion of market risks. In addition, commercial banks should update the qualifications of their customers in real time to avoid unnecessary market risk losses. Hauf and Postha argue that with rising interest rates and a slowdown in the venture capital business, Silicon Valley banks have seen their liquidity come under pressure and have had to sell off some of their available-for-sale securities in an attempt to raise new capital [4]. This led to investors panicking and moving their uninsured deposits to safety, putting more pressure on the bank's liquidity position, and Silicon Valley Bank suffered from a bank run fueled by social media. This demonstrates how quickly social media can spread information and trigger market panic in a short period of time, which can negatively impact the liquidity and stability of a bank. This highlights the importance of social media as a market risk factor. In addition, the authors emphasize the importance of managing interest risk exposure and managing liquidity risk. If trust disappears, every bank remains on the verge of failure even if capital and liquidity buffers look quite good. This observation highlights the critical nature of market risk, especially in the age of social media, where information travels quickly and far-reaching.

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5. Systemic Risk

Systemic risk is closely related to banks and is the reason why commercial banks need to be regulated. Previously, many scholars had focused regulation on a specific institution, but as time progressed and systemic risk began to emerge, people began to focus on financial stability. Systemic risk spreads very fast among banks and has a chain effect, it is a kind of communication of information, which is the inevitable development of the current economy [11]. Generally speaking, the bank's business is mainly short-term debt, and invest these funds in long-term assets in order to make a profit. However, there are often many variables, such as market changes, policy implementation, and so on. While regulation can protect against systemic risk to a certain extent, it also has certain drawbacks. Deposit insurance can avoid runs in many cases. As for systemic risk, especially in the case of aggregate risk and hidden systemic exposures, a situation may arise where a bank lends to a firm in a foreign currency and when the currency depreciates, the bank loan has difficulty in providing enough foreign currency to service the debt [12]. In this regard that the systemic risk assumed by the bank should be effectively controlled.

In addition, there are many ways in which systemic risk can be assessed and predicted as well as regulatory tools need to be harmonized. Modelling credit risk exposures is proposed to address the rapid spread of systemic risk, which allows for the combined assessment of multiple regulatory tools and discourages insolvency. Korzeb and Niedziółka for the period of the COVID-19 pandemic used two linear sorting methods to measure the value of the risk, the Hellwig method and the TOPSIS method [13]. The risk of calculating the risk of the portfolio in relation to recognized impairments and the resilience of the bank's credit portfolio by means of the values of capital adequacy, liquidity, etc., these methods can also complement the models used by regulators at the moment to monitor the stability of banks.

6. Conclusion

The Fed's continued policy of raising interest rates is intended to suppress inflation, but it has also had many adverse effects on commercial banks. On the one hand, it has increased the cost of lending for commercial banks, which has depreciated their financial assets and made it difficult for them to withstand systemic risks. On the other hand, the real economy is far from being as good as it was before, bank profits have shrunk sharply, and runs on the banks may be widespread, ultimately leading to the bankruptcy of commercial banks that have a weaker ability to withstand risks. This was one of the triggers for the bankruptcies of Silicon Valley Bank and Signature Bank, among others. This series of chain of events to the U.S. market has brought also not only limited to liquidity risk, credit risk and market risk, but also will spread the risk to the world. The Fed's interest rate hike, although it did not achieve the desired purpose, and brought a lot of unforeseen and difficult to solve the problem, but the Fed's interest rate hike may come to an end for the time being, in the next few months or even a few years began to slowly reduce interest rates, gradually let the market adapt to interest rates and stability of the operation down the road.

References

[1] *Schwarcz, S. L. (2008). Systemic Risk, Georgetown Law Journal, 97, 193-249.*

[2] *Cachanosky, N., Cutsinger, B., Hogan, T. L., Luther, W. J., & Salter, A. W. (2021). The Federal Reserve's response to the COVID-19 contraction: An initial appraisal. Southern Economic Journal, 87(4), 1152-1174.*

[3] *Al-Sowaidi, A. S. S. S., & Faour, A. M. W. (2023). Causes and Consequences of the Silicon Valley Bank Collapse: Examining the Interplay Between Management Missteps and the Federal Reserve's Floundering Decisions. Journal of World Economic Research, 12(1), 38-46.*

[4] *Hauf, P., & Posth, J. (2023). Silicon Valley Bank - (Why) did regulation and risk management fail to uncover substantial risks? Social Science Research Network.*

DOI: 10.54254/2754-1169/83/20240756

[5] *Choi, D. B., Goldsmith-Pinkham, P., & Yorulmazer, T. (2023). Contagion effects of the Silicon Valley bank run (NBER Working Paper No. 29210). National Bureau of Economic Research.*

[6] *Huynh, J. (2023). Funding liquidity risk: Does banking market structure matter? Managerial Finance, 49(1), 82-97.*

[7] *Berner, R., Schoenholtz, K. L., & White, L. J. (2023). Evaluation of the policy response: On the resolution of Silicon Valley Bank, Signature Bank, and First Republic Bank. SVB and Beyond: The Banking Stress of 2023.*

[8] *Koulouridi, E., Kumar, S., Nario, L., et al. (2020). Managing and monitoring credit risk after the COVID-19 pandemic. McKinsey & Co. https://www.mckinsey.com/business-functions/risk/our-insights/managing-and-monitoring-credit-risk-after-the-covid-19-pandemic*

[9] *Rossi, S. (2023). The banking crisis of Credit Suisse: Origins, consequences, and reform proposals. Investigación Económica, 82(325), 21-36.*

[10] *Savvides, S. C., & Savvidou, N. (2012). Market risk disclosures of banks: A cross-country study. International Journal of Organizational Analysis, 20(4), 379-405.*

[11] *Arteta, C., Kamin, S., & Ruch, F. U. (2022). How do rising US interest rates affect emerging and developed economies? It depends. World Bank Group. Policy Research working paper, no. WPS 10258.*

[12] *Nistor, S., & Ongena, S. (2023). The impact of policy interventions on systemic risk across banks. Journal of Financial Services Research, 1-52.*

[13] *Korzeb, Z., & Niedziółka, P. (2020). Resistance of commercial banks to the crisis caused by the COVID-19 pandemic: The case of Poland. Equilibrium. Quarterly Journal of Economics and Economic Policy, 15(2), 205-234.*