

Risk Management and Responses of Banks under COVID-19 and Fed Rate Hike

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Abstract: This paper aims to study how banks carry out risk management and how to avoid systemic risks in the banking industry under the interest rate hike policy in the post-epidemic era. This paper divides bank risks into four main aspects to analyze the impact of sharp interest rate hikes on bank risk management in combination with the acquisition of Credit Suisse and the bankruptcy of Silicon Valley Bank. They are credit risk, liquidity risk, market risk (specifically interest rate risk), and systemic risk. After research, this paper finds that during the COVID-19 period, including interest rate hikes, governments have introduced corresponding policies for risk management. Moreover, when the market risk puts too much pressure on the bank, it will lead to credit risk and then liquidity risk, which may eventually trigger systemic risk under the joint effect. Given the current high inflation situation, the high level of interest rates will remain for a long time. Therefore, banks should do as much as possible to manage risks and reduce the possibility of triggering systemic risks.

Keywords: Systemic Risk, Financial Stability, Risk Management

1. Introduction

The global COVID-19 pandemic began in March 2020. The supply chain disruption, rising enterprise costs, supply and demand imbalance, and other issues caused by the novel coronavirus have generally brought great pressure to the international community. Based on this, the United States and other developed western countries have embarked on a series of fiscal stimulus packages to boost household incomes and corporate spending. Among them, the Federal Reserve has lowered the federal funds rate twice in a month to 0~0.25%, almost zero, and implemented an unlimited quantitative easing policy, with a large expansionary fiscal policy, so that the recession of the US economy began to recover rapidly from the third quarter of 2020. In addition, the combination of extremely expansionary fiscal policy and expansionary monetary policy has gradually shifted the US from low growth, low employment, and low inflation to high growth, high employment, and high inflation. It can be said that the COVID-19 pandemic dealt a severe blow to the US economy, and the recession was only worse than the Great Depression of 1929-1933. Still, the decisive decision of the US government made the recession last only two months, which is the shortest in history.

On the surface, the Fed's policies had worked well, with rapid economic growth and an optimistic job market, but a deeper look reveals hidden dangers, notably high inflation [1]. In June 2022, the U.S. inflation rate reached 9.1%, the highest in nearly 40 years. Besides, the euro area's annual inflation rate was up to 10.6% in October 2022. Then, control of inflation has become the primary

goal of the European and American governments in formulating various policies. And the effectiveness of governance is also directly related to the rise and fall and trends of their respective economies [2]. Thus, the US Federal Reserve and the European Central Bank launched the most aggressive monetary tightening in history, represented by a series of measures to raise interest rates. By November 8, 2023, they had raised interest rates 11 times and 10 times, respectively, for a cumulative total of 525 and 450 basis points.

In the post-epidemic era, under the great changes in the economic market and the pressure of monetary policies such as the governments' interest rate hike, several influential small and medium-sized banks have been bankrupt and acquired, such as Credit Suisse, Silicon Valley Bank, Signature Bank, First Republic Bank, and so on. The major reason why these banks went bankrupt was that they did not manage and control risks well. Though inflation in major economies such as Europe and the United States has cooled down, and the pace of interest rate hikes has slowed down, the stickiness of core inflation still lingers [2]. Therefore, the issue of how banks should manage their day-to-day risks to contribute to the stability of capital markets still needs to be given high attention. In response to this problem, this paper will analyze and discuss four aspects: credit risk, liquidity risk, market risk, and systemic risk.

2. Credit Risk

Credit risk is the risk that a counterparty will not honor a debt as it matures. Credit risk, also known as default risk, refers to the possibility that the borrower, the issuer of securities, or the counterparty is unwilling or unable to perform the terms of the contract due to various reasons, which constitutes a breach of contract and causes the bank, investors or the counterparty to suffer losses.

The bank credit business is the cornerstone of a bank. Banks charge principal and interest by issuing loans and make profits after deducting costs to maintain operations. Thus, credit risk is the most important part that must be addressed in the management of commercial banks. It is essential to do a good job in the risk assessment of commercial banks' daily loans and investments. On the contrary, failure to manage credit risk effectively can lead to other risks, such as liquidity risk, and ultimately lead to bankruptcy. A case in point is the Credit Suisse affair.

Founded in 1856, Credit Suisse is the second largest bank in Switzerland, with large assets, high complexity and strong linkages with other financial institutions. In November 2021, it was included in the 30 global systemically important banks, having a vital impact on the smooth and efficient operation of the entire financial system. Its core business is concentrated in three segments: investment banking, wealth management and asset management [3].

The external causes of the Credit Suisse crisis are as follows. At the beginning of the outbreak, Europe's rescue efforts were relatively modest, causing its economic recovery to be slower than that of the United States. Later, the Russia-Ukraine war exacerbated inflation, causing the European banking sector to bear the double pressure of increasingly macro fundamentals fragility and high inflation. In order to curb high inflation, the ECB abandoned the zero interest rate policy that has been in place since 2016 and began to raise interest rates in July 2022. In the context of continued interest rate hikes and liquidity tightening by the ECB, combined with the impact of the energy crisis brought about by the conflict between Russia and Ukraine, European economic growth has slowed down rapidly, and the financial system and asset prices have come under great pressure. This has further exacerbated the decline in the size of Credit Suisse's business and the deterioration of its asset quality [4].

The internal causes of the credit crisis at Credit Suisse lie in its aggressive risk appetite and poor risk management. First of all, Credit Suisse relies too much on high-risk investment banking business to pursue short-term profits, which leads to an imbalance between income and risk. In business choice, Credit Suisse focuses on pursuing short-term profit. The former Chief Risk Officer of Credit Suisse

constantly stressed that the risk and compliance department should be “commercialized” and “aligned with the front office”, which fostered a risk culture that sought short-term profits. Credit Suisse has chosen an extremely aggressive global expansion strategy, focusing on the U.S. market and riskier areas like CDO and LBO. The average net income of its investment banking business has remained above 40% for a long time. By contrast, the likes of Morgan Stanley and Goldman Sachs have long maintained a share of investment banking revenue below 25%, far less than Credit Suisse. Apart from that, regarding its customer selection, Credit Suisse has the problem of high risk and low return. Credit Suisse worked with clients with high leverage, high credit risk, and high business concentration without adequately hedging each other’s credit risk. At the same time, the bank continued to reduce margin in order to maintain client relationships, causing its risk exposure to rise constantly [3]. Second, Credit Suisse had flawed processes and attitudes to assessing risk in its day-to-day loans and investments. To be specific, reporting risk assessments is not timely. The delayed transmission of risk information will bring irreparable losses to banks. For instance, in the previous Archegos blow-up event, the board had never heard about the relevant risk report before the crisis happened. Additionally, Credit Suisse ignored the risk assessment in order to preserve client relationships. And it chose to reduce margin to meet client demand repeatedly. This behavior reflects its attitude problem of ignoring the evaluation results in the face of high risks.

To sum up, the credit crisis of Credit Suisse broke out under the combined effect of the macro external conditions of monetary tightening and the internal conditions of the bank's poor credit risk control. On June 12, 2023, local time, Swiss Bank announced that it had officially completed the acquisition of Credit Suisse. In order to prevent the emergence of a large-scale credit crisis in the banking sector, central banks in Europe and the United States have issued some relevant policies. For example, the Federal Reserve announced the establishment of a temporary repurchase agreement facility for foreign and international monetary authorities (FIMA Repo Facility) [5]. Moreover, the Fed enacted measures to extend the termination date for most lending facilities [6]. Also, the Fed announced the relief of leverage ratio [7]. Besides, the ECB has also adjusted TLTRO III and collateral easing measures during the pandemic [8]. All the measures help ease market strains from the coronavirus and improve banking organization’s ability to provide credit to households and businesses to a certain extent.

3. Liquidity Risk

Liquidity risk refers to the risk that although commercial banks have solvency, they cannot obtain sufficient funds in time or cannot obtain sufficient funds at a reasonable cost to cope with the growth of assets or pay maturing debts. In the context of the COVID-19 pandemic and interest rate hikes, the reduction of corporate lending behavior, the depreciation of bank bonds, and the loss of depositors' trust in banks may trigger liquidity risk crises. This is the cause of the Silicon Valley Bank’s collapse in March.

As the 16th largest bank in the United States, SVB is a newcomer in the U.S. banking sector and has a great reputation in the technology venture capital industry. Since its founding in 1983, SVB has financed over 30,000 technology startups and is involved in more than half of all venture capital activity in America. Such a bank also failed to survive three years of policy changes during the coronavirus epidemic, eventually becoming insolvent and declaring bankruptcy. As to the reason, the change of the macroeconomic environment is only the trigger. The particularity of its business as well as the defect of liquidity management led to its demise [9]. From the perspective of liquidity risk, this paper will discuss this problem from three aspects.

First, the structural mismatch between assets and liabilities is serious. From the liability side, SVB's non-interest-bearing demand deposits are its main source of liabilities. This is because SVB serves mostly high-tech companies and start-ups. These companies often keep highly liquid deposits

in banks to ensure they have enough capital for acquisitions as well as research and development [10]. Additionally, in the early stage of the epidemic, the interest rate was almost zero. The extremely low financing cost made the science and technology enterprises set off an IPO boom, bringing huge liquidity. This has allowed SVB to obtain many demand deposits from PE/VC and scientific and technological enterprises [9]. From the asset side, SVB has relatively little cash and equivalents, and more assets are long-term held-to-maturity securities. SVB's bond investments are primarily U.S. Treasury securities and Mortgage-Backed securities or bonds issued by government-sponsored agencies [10]. As mentioned above, the low interest rate environment at the beginning of the pandemic led to a surge in liabilities of SVB. These idle funds were also heavily allocated to long-term US Treasury bonds and Mortgage-Backed Securitization. This serious long-term and short-term structural mismatch undoubtedly lay a hidden danger for the liquidity crisis caused by the subsequent high-interest rate environment.

Second, single client structure and excessive risk concentration. SVB is clearly positioned and has a single source of liability. SVB focuses on the high-tech and life sciences industries and invests in the global PE/VC market. A focus on investing in start-ups enables SVB to achieve higher returns in later stages. Still, the high concentration of liabilities means the bank is more vulnerable to the industry's strength [11]. As the Federal Reserve has raised interest rates, raising capital has become much more expensive and difficult for venture capital firms. As the budgets of venture capital institutions shrink, financing for high-tech enterprises has become more difficult. Then, in order to ensure the normal development and operation of the company, enterprises have chosen to withdraw their current deposits in the bank. Liquidity risks are further amplified.

As a result, demand deposits at SVB shrank by \$45.1 billion in 2022. To replenish liquidity, SVB increased short-term borrowing by \$13.5 billion. However, it still could not resist the loss of deposits on the liability side and eventually embarked on the road of asset selling [12]. SVB's sell-off created panic in the capital market, sharply dropping SVB's share price. Depositors' loss of trust in SVB triggered a massive run. A liquidity crisis broke out. Ultimately, on March 10, 2023, SVB officially declared bankruptcy due to insufficient liquidity and insolvency.

Third, regulatory deficiencies. Since the Economic Growth, Regulatory Relief, and Consumer Protection Act was amended in 2018, the regulatory standard for systemically important banks has been increased from \$50 billion to \$250 billion. SVB is classified into the fourth tier of regulatory scope. This further loosens the regulatory standards of SVB. SVB is not required to meet the Net Stable Finance ratio (NSFR) and Liquidity Covered Ratio (LCR). It only needs to submit monthly regulatory statements to regulators and conduct liquidity stress tests. Thus, when its executives chose the wrong expansion strategy and exposed banks to liquidity risks, the aggressive investment behavior did not raise the alarm of the regulatory authorities. Lax liquidity regulation eventually led to bank runs [11].

In summary, maturity mismatches of assets and liabilities, unitary customer structure, and weak supervision contributed to this liquidity crisis. Regarding what governments have done to deal with liquidity risk, it is worth referring to the policies proposed for credit risk mentioned above. Policies such as extending the termination date of lending facilities, relieving leverage ratio, and introducing collateral easing measures have all helped reduce liquidity risk.

4. Market Risk

Market risk includes interest rate risk, exchange rate risk, stock price risk, and commodity price risk. This paper will discuss the interest rate risk, which has fluctuated greatly recently.

According to the Principles for Management of Interest Rate Risk issued by the Basel Committee in 1997, interest rate risk is defined as the possibility that the actual income of commercial banks deviates from the expected income or the actual cost deviates from the expected cost, so that the

actual income is lower than the expected income, or the actual cost is higher than the expected cost, thus causing commercial banks to suffer losses. It refers to the risk that a financial instrument invested in a fixed interest rate may fall in price when market interest rates rise.

Since the COVID-19 epidemic, European and American governments have used tightening monetary policies to adjust and control high inflation. One representative operation is to raise interest rate. On March 17, 2022, the Federal Reserve raised interest rates by 25 basis points. In May of the same year, the Federal Reserve raised interest rates again by 50 basis points. By November 11, 2023, the Federal Reserve has announced 11 interest rate increases, ranging from 25, 50, and 75 basis points. Until the pause in September this year, the cumulative rate of interest rate increase has reached 525 basis points. And the interest rate level has remained at around 5.25%-5.50% [13]. Similarly, the European Central Bank announced the start of interest rate hikes in July 2022, only to pause in October this year. So far, it has raised interest rates by a total of 450 basis points. Such a big rise in interest rates has triggered interest rate risks in the banking industry. Some small and medium-sized banks led by Silicon Valley Bank, Signature Bank, and First Republic Bank have closed down in the crisis. Next, this paper will take SVB as an example to analyze the crisis.

After the United States implemented a wireless quantitative easing monetary policy in 2020, the asset liability sheet of SVB expanded rapidly. Nevertheless, assets and liabilities were severely mismatched at the time limit, resulting in high interest rate risk [14]. The US interest rate hike cycle beginning in 2022 has caused many floating losses for financial institutions holding various types of dollar-denominated bonds, such as US Treasury bonds, government-backed agency bonds, and MBS. And because bond holdings account for a relatively large proportion of total assets, SVB's floating losses are particularly prominent. As a ratio of unrealized losses to the book value of its bond investments, SVB had 16.6% of items held to maturity and 9.72% of items available for sale at the end of 2022. Although it is not reflected in the income statement, SVB has taken a large float loss on the bonds. If these bonds can be held to maturity, the losses will be absorbed gradually. But suppose the bonds are not held to maturity. In that case, floating losses will be recorded in the income statement, affecting the bank's net profit, thus eroding bank capital and reducing bank capital adequacy and stability [10]. Unfortunately, however, as mentioned in the liquidity risk section, SVB has a single customer structure, which scientific and creative enterprises dominate. In the high interest rate environment, these enterprises generally have problems such as declining valuations, financing difficulties, tight cash flow, and so on. So, they have withdrawn their deposits from banks. A small bank run was set off. At the same time, due to the rising capital interest rate, the cost of retaining deposits also ascended. There were massive outflows from the liability side. The interest rate hike led to a large number of unrealized losses on the asset side, and the discount sale of assets under the demand for withdrawals made the floating loss on the book a real loss. The market, hit by the news, began to worry about the potential for huge losses on held-to-maturity securities. Meanwhile, more than 97% of the deposits of SVB were not protected by deposit insurance at the end of 2022, which caused a large run by depositors and led to bankruptcy [9]. From the whole process of the event, the occurrence of interest rate risk is the fuse of the crisis.

5. Systemic Risk

Systemic risk refers to the risk of widespread problems or collapse of the whole system in the financial system when banks fail to control the risk of a certain aspect effectively. This risk can be caused by independent micro-factors or by larger macroeconomic factors. For example, the subprime crisis in 2008 was a systemic risk caused by widespread credit risk. This time, the near-systemic risk is mainly caused by serious market risk. In fact, in many cases, systemic risk is difficult to regulate fully. What can be done is to reduce the probability and impact of systemic risks with the joint efforts of governments, regulators and financial institutions.

In order to avoid the occurrence of systemic risk, it is essential to do an assessment of systemic risk. Systemic risk assessment in the banking sector requires a comprehensive risk management framework. For credit risk assessment, banks commonly use quantitative models such as the Altman Z-score, KMV model, and credit scoring model. For liquidity risk assessment it is usually measured by applying ratios such as LCR and NSFR. VaR (value at risk) or ES (expected loss) are two important tools for market risk assessment. Excessive leverage can also lead to imbalances in financial institutions' balance sheets. Therefore, it is necessary to evaluate the stability and solvency of the banking industry by calculating the leverage ratio (leverage ratio = total liabilities/shareholders' equity). Furthermore, banks are required to conduct regular stress tests to simulate the response of the financial system to extreme risk events and assess the risk tolerance of financial institutions and the system as a whole. Besides, it is also necessary to assess the macroeconomic environment factors that may lead to systemic risks by considering the economic cycle and macroeconomic indicators (e.g., GDP growth rate, inflation rate, unemployment rate, etc.). Interconnectedness, systemic risk indicators (such as SIFIs), etc., are all included in the framework. It should be noted that the methods and indicators of systemic risk assessment are flexible and need to be adjusted according to the specific financial system and financial environment. In addition, when assessing systemic risk, various indicators and methods should be integrated to reflect the risk status of the financial system as comprehensively as possible.

After the subprime crisis of 2008, Basel III has been introduced. Basel III strengthens the requirements for the quantity and quality of bank capital. For quantity, Basel III proposes capital buffer requirements based on the minimum capital requirements, including retained capital buffer requirements (2.5%), countercyclical capital buffer requirements (0~2.5%), and G-SIBs additional capital buffer requirements (1~3.5%), and so on. According to the provisions of Basel III, the capital adequacy ratio standard of the banking industry has been raised to 10.5%-16%, much higher than the 8% of Basel II. For quality, Basel III divides bank capital into Tier 1 capital and Tier 2 capital, and Tier 1 capital is further divided into core Tier 1 capital and other Tier 1 capital. On this basis, the minimum requirements for core Tier 1 capital adequacy ratio, Tier 1 capital adequacy ratio and capital adequacy ratio are proposed. If calculated according to the minimum requirements (taking into account retained capital buffer), the bank's core Tier 1 capital and Tier 1 capital should account for no less than 66.7% and 81.0% of the total capital, respectively, which is a significant increase from the Basel II core capital requirement of not less than 50% [15].

Overall, Basel III has been relatively effective so far. During the rate hike, many problems of bank liquidity risk have been avoided, and the occurrence of systemic risk in the entire banking industry has been avoided to a large extent. However, it remains to be assessed whether Basel III will effectively avoid the emergence of systemic risks as further rate hikes continue (perhaps) and the situation extends.

6. Conclusion

Thanks to the lessons learned from the subprime crisis in 2008, the effective regulation of Basel III and timely bailouts from governments have prevented this sharp rate hike from causing large-scale systemic risks. But locally, credit risk and liquidity risk caused by interest rate risk occur frequently, resulting in the volatility of the banking industry. Among them, the representative ones include the acquisition of Credit Suisse Bank, caused by credit risk, and the bankruptcy of First Republic Bank, Silicon Valley Bank, etc., caused by liquidity risk, as analyzed in detail above.

Currently, the Federal Reserve and the European Central Bank are in the pause phase of interest rate hikes. Their interest rates remain at 5.25%-5.50% and 4.25%-4.50%, respectively. While inflation figures are down sharply from last year's peak, there is still a long and arduous way to go before reaching the Fed's and ECB's target of 2% inflation. Even if the Fed or ECB does not continue

to raise interest rates, the existing high interest rate will still remain for a long time. This is a great challenge for the banking sector. All banks must attach significant importance to the effective control of market risk, credit risk, and liquidity risk to avoid the occurrence of systemic risk so as to maintain the sustainable, healthy, and stable development of themselves and the whole banking industry.

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