

The Impact of the Federal Reserve's Monetary Policy on the Bankruptcy of Silicon Valley Bank

Sun Ran

University of International Business and Economics, Beijing, China

Abstract: This article analyzes the impact of the monetary policy adopted by the Federal Reserve in 2020-2022 on the bankruptcy of Silicon Valley Bank in the United States. It reveals the huge influence of the Federal Reserve's extraordinary policy direction on banking institutions, and proposes that the People's Bank of my country should learn lessons from the Federal Reserve's extraordinary monetary policy operations and avoid negative impacts.

Keywords: Federal Reserve; Monetary Policy; Silicon Valley Bank; Bank Bankruptcy

1. Introduction

On March 10, 2023, the US banking regulator announced the closure of Silicon Valley Bank. This news shocked the whole world.

Silicon Valley Bank is the 16th largest national bank in the United States. It has been established for 40 years and is headquartered in California. As of the end of 2022, the total assets were US\$209 billion and deposits exceeded US\$175 billion. The bank's main business is to serve American high-tech start-ups located in Silicon Valley. Its customers include well-known high-tech companies such as Google, Facebook, Airbnb, Tesla, Uber, Lyft, Dropbox, Square, and well-known venture capital institutions that invest in high-tech industries such as Softbank Vision Fund and Sequoia Capital.

The bank's collapse is the second largest bank failure in the United States since the 2008 financial crisis. Prior to this, the Washington Bank, which collapsed in 2008, was the largest bank failure in the United States to date. The collapse of the bank has a far-reaching impact on the entire US financial system. On March 8, Silvergate Capital, a US cryptocurrency bank, just announced that it would cease operations and voluntarily liquidate its subsidiary Silvergate Bank, which provides services for its

cryptocurrency business. Then on March 12, the US Federal Reserve and the US Federal Deposit Insurance Corporation FDIC issued a joint statement announcing the closure of Signature Bank, headquartered in New York. On March 13, the stock price of First Republic Bank of the United States plummeted 60% and was acquired by JPMorgan Chase Bank on May 1, 2023. On March 19, UBS announced the acquisition of Credit Suisse for 3 billion Swiss francs, and Credit Suisse, which was founded 167 years ago, became history. This article will discuss the impact of the Federal Reserve on this wave of bank failures.

2. The Basic Functions of the Federal Reserve System

The Federal Reserve System (Federal Reserve System), referred to as the Fed (hereinafter referred to as the Fed), is the central bank of the United States. Its main responsibility is to provide a safe, flexible and stable monetary and fiscal system for the United States.

According to the Fed's official website, it mainly promotes the effectiveness of the US economic operation and the public interest by providing the following five basic functions.

1. Implement national monetary policy to promote maximum employment, stable prices, and appropriate long-term interest rates in the United States.
2. Promote the stability of the fiscal system by actively supervising and participating in the US and overseas markets to find minimized and controllable systemic risks.
3. Promote the safety and soundness of individual financial institutions and monitor their impact on the entire financial system.
4. Maintain the safety and efficiency of the US dollar payment and settlement system by serving the US banking industry and the US government to facilitate US dollar transactions and payments.
5. Promote consumer protection and community development by focusing on

consumer supervision and inspection, studying and analyzing emerging consumer events and trends, community economic development activities, and improving consumer laws and regulations.

3. The Process of this Wave of Bank Failures

The reasons for the collapse of Silvergate Bank (SGB), Silicon Valley Bank (SVB), and Signature Bank (SB) are basically the same. Taking Silicon Valley Bank as an example, the specific process is as follows:

On March 8, 2022, Silicon Valley Bank announced the sale of \$21 billion in bonds and confirmed a loss of \$1.8 billion. At the same time, it announced the issuance of new shares and preferred shares to raise \$2.25 billion. As soon as the news came out, the capital market reacted violently. The market believes that Silicon Valley Bank has suffered serious losses, so much so that it has to sell long-term bonds at a loss and needs to continue financing. This shows that the bank's potential losses may far exceed \$1.8 billion. On March 9, Silicon Valley Bank's stock plummeted 60%, and Moody's Ratings rated Silicon Valley Bank's stock as junk, and it was directly suspended. At the same time, a large number of customers heard the news and withdrew their deposits from Silicon Valley Bank, further exacerbating Silicon Valley Bank's capital shortage and forming a run on the bank. This is almost 1/4 of Silicon Valley Bank's deposits, which directly led to the bankruptcy of Silicon Valley Bank.

4. Reasons for this Bank Failures

4.1 Risk Control Problems

Securities held account for 55% of total assets, which is too high.

Since Silicon Valley Bank's Chief Risk Officer CRO left in April 2022, the position has not been filled. As a result, Silicon Valley Bank actually did not have good risk control for most of 22 years.

Due to the large-scale quantitative easing measures taken by the United States in the past three years of the epidemic, a large amount of US dollars were injected into the market, resulting in an excess of US dollars in the market and a decline in US dollar interest rates. In order to seek higher rates of return, a large amount of US dollars have poured into the US high-tech industry, especially in the technology

companies in the Silicon Valley area. The valuations of these technology companies have risen accordingly, so they have accepted a large amount of US dollars. And since Silicon Valley Bank is mainly serving these technology companies, it naturally received a large amount of idle US dollars. According to statistics, before the collapse of Silicon Valley Bank, deposits rose from 60 billion to 190 billion US dollars from 2020 to 2021. Because the market is flooded with various excess US dollars at this time, the US dollar yield has plummeted. In order to obtain higher returns, Silicon Valley Bank purchased a large number of US long-term fixed income bonds (Long-term Fixed income Securities). Two-thirds of the nearly \$110 billion that Silicon Valley Bank added was used to purchase these long-term fixed-income bonds. 14% of them were U.S. Treasury bonds and 68% were MBS (Mortgage-Backed Security). At that time, the interest rate for U.S. 2-year Treasury bonds was 0.2%, and the interest rate for 30-year Treasury bonds was 1.5%. Silicon Valley Bank therefore purchased a large number of long-term bonds in the hope of obtaining a higher rate of return. This operation laid the groundwork for its bankruptcy in the future. Since the risk of long-term bonds is much higher than that of short-term bonds, especially the duration is greatly affected by interest rate changes. A 1% change in interest rates may affect the price of long-term bonds by more than 20%. The price of long-term bonds is inversely proportional to the long-term bond interest rate. The higher the long-term interest rate price, the lower the long-term bond price.

4.2 The Fed's Extraordinary Monetary Policy During the Epidemic

The Fed's primary task is to maintain employment, followed by maintaining price stability. Since the outbreak of the epidemic in 2020, many companies have found it difficult to operate and have laid off a large number of employees, as the U.S. economy and the world economy have been severely affected by the epidemic. In order to prevent the U.S. unemployment rate from rising to an unacceptable level, the U.S. government has launched an unprecedented quantitative easing policy (QE, the same below). A large amount of over-issuance of US dollars is used to maintain market liquidity and stimulate companies to

maintain or expand their scale. During the epidemic, a large amount of cash was also issued to ordinary people to stimulate public consumption and maintain the operation of the U.S. economy. These measures do keep the U.S. economy running normally, but at the same time they also bring about the problem of over-issuance of currency and rising prices. At the same time, the Federal Reserve has continuously lowered the federal benchmark interest rate, from announcing a 0.5% reduction on March 3, 2020 to announcing a reduction to the 0-0.25% range on March 15. The 2020 2-year Treasury bond interest rate is 0.2%, and the 30-year bond interest rate is 1.5%. Silicon Valley Bank has found room for risk-free arbitrage. Therefore, deposits are absorbed at high interest rates and then invested in long-term U.S. bonds (Long Term Fixed Income Securities). In the past two years, an additional \$130 billion has been added, and nearly two-thirds of it has been used to purchase long-term bonds. 14% of Silicon Valley Bank's 117 billion bond investment is purchased in government bonds, and 68% is in mortgage MBS. This is a typical short-term debt and long-term investment behavior. The risk is that once depositors withdraw cash on a large scale, Silicon Valley Bank will face the dilemma of having no money to pay and can only exchange cash for cash by selling long-term bonds. However, this may cause the price of long-term bonds to fall, thereby triggering a stampede and selling of long-term bonds, followed by huge losses for bond holders. After the Fed raised interest rates in 2022 year, the interest rates of short-term bonds rose, which was much higher than the original long-term bonds, causing the prices of long-term bonds in the market to fall (the interest rates of newly issued short-term bonds

were higher than the existing long-term bonds, which led to the sale of long-term bonds in the market to buy short-term bonds, causing the prices of long-term bonds to fall.) Because MBS has negative convexity, the yield and price are roughly inversely proportional. Negative convexity means that within a certain range, whether the interest rate rises or falls, the price of the bond will fall. The Federal Reserve has raised interest rates continuously in 2022. By February 2023, the Federal Reserve has raised the federal benchmark interest rate to an interest rate of 4.83%, which is far more than the 1.5% interest income of the long-term bonds that Silicon Valley Bank originally purchased (see Appendix 1, Figure 1, and Figure 2 for the difference in interest rates between short-term and long-term bonds in the United States). Due to the inverted interest rate of long-term bonds in the United States, the interest rate of long-term bonds is lower than that of short-term bonds. Silicon Valley Bank needs to pay higher interest to customers, making Silicon Valley Bank's profit model unsustainable. Silicon Valley Bank had to sell its long-term bonds at a low price, which led to a drop in the price of bonds held by Silicon Valley Bank, causing greater losses. Silicon Valley Bank did not hedge and stop losses in time, and lost \$15 billion in 2022. Silicon Valley Bank originally had 200 billion in savings, but a large number of startups went bankrupt in 2022, and funds were tight. A large number of deposits were withdrawn from Silicon Valley Bank due to fees, resulting in Silicon Valley Bank's savings falling to \$175 billion at the end of 2022. Silicon Valley Bank went to the Federal Home Loan Bank to borrow \$30 billion to fill the savings gap, but it was still not enough to support Silicon Valley Bank's liquidity.

Table 1. The Difference in Interest Rates Between Short-Term and Long-term Bonds

Month/Year	Federal Funds Rate (%)	3-Month Treasury (%)	2-Year Treasury (%)	5-Year Treasury (%)	10-Year Treasury (%)
Jan 2022	0.08	0.15	0.76	1.30	1.76
Feb 2022	0.08	0.17	1.05	1.63	1.83
Mar 2022	0.33	0.50	2.28	2.55	2.32
Apr 2022	0.33	0.82	2.71	2.95	2.85
May 2022	0.83	1.14	2.57	2.92	2.94
Jun 2022	1.58	1.69	2.95	3.24	3.02
Jul 2022	2.33	2.36	3.35	3.74	3.26
Aug 2022	2.33	2.97	3.41	3.78	3.19
Sep 2022	3.08	3.31	4.22	4.03	3.83

Oct 2022	3.08	3.80	4.47	4.18	4.10
Nov 2022	3.83	4.07	4.33	4.12	3.95
Dec 2022	4.33	4.35	4.36	4.16	3.88
Jan 2023	4.58	4.59	4.25	3.79	3.52
Feb 2023	4.83	4.87	4.60	4.19	3.92
Mar 2023	4.83	4.86	4.07	3.74	3.55

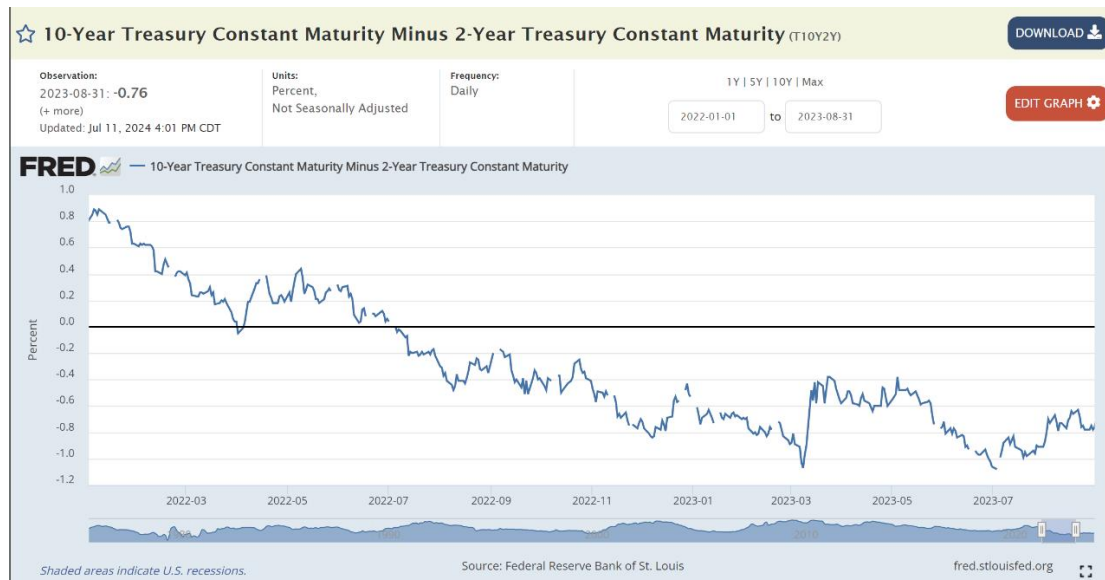


Figure1. 10-Year Treasury Constant Maturity Minus 2-Year Treasury Constant Maturity

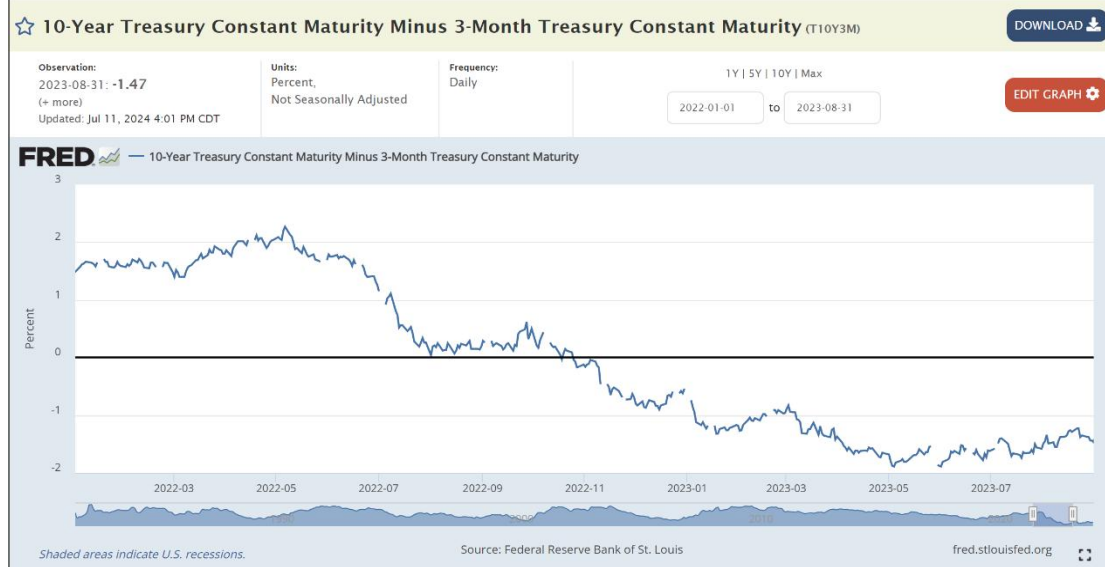


Figure2. 10-Year Treasury Constant Maturity Minus 3-Month Treasury Constant Maturity becomes an inevitable choice.

3. Silicon Valley Bank's Customer Types are too Concentrated in Technology Startups

Silicon Valley Bank's customers are too concentrated in technology startups. Such companies have weak risk resistance. When faced with the Fed's rapid rate hikes, which lead to poor market liquidity, poor corporate profitability, and the inability to continue financing, withdrawing a large amount of deposits to pay for various corporate expenses

4. The Herd Effect of Customers

Silicon Valley entrepreneurs are closely connected, and Silicon Valley venture capitalists are well-informed. Once they hear the news, they will call on these companies to withdraw money from Silicon Valley Bank. This move immediately formed a trend. In one day, up to 42 billion US dollars were attempted to withdraw money, which directly led to the

run and bankruptcy of Silicon Valley Bank. Two days before the collapse of Silicon Valley Bank, Silvergate Bank collapsed, which may be one of the direct reasons for the collapse of Silicon Valley Bank. It was precisely because Silvergate had just collapsed, and Silicon Valley Bank only had a loss of 1.8 billion and 2.25 billion in financing, which directly led to a violent reaction in the market, forming a run and leading to the bankruptcy of Silicon Valley Bank. From the subsequent collective decline of bank stocks in the US stock market, it can be seen that the market at that time was very sensitive to bank stocks. At the slightest sign of trouble, it was like a frightened bird. A large number of customers were worried that their deposits would not be safe, and they withdrew a large amount of money from Silicon Valley Bank to form a herd effect.

In summary, although Silicon Valley Bank's own risk control, customer concentration and customer herding effect are also one of the reasons for its closure, the fundamental reason for Silicon Valley Bank's short-term borrowing and long-term investment is the massive QE of the Federal Reserve during the epidemic to protect employment. It is also because of the rapid interest rate hike after the end of the Federal Reserve's QE that Silicon Valley Bank's business model is unsustainable, leading to its bankruptcy.

5. Fed Response Measures During this Period

After Silicon Valley Bank (SVB) declared bankruptcy, the Federal Reserve, the Treasury Department, and the Federal Deposit Insurance Corporation (FDIC) issued a joint statement on March 12, local time, saying that in order to ensure the safety of all depositors' funds, SVB depositors can withdraw all funds starting Monday, March 13. Any losses related to the bankruptcy of SVB will not be borne by taxpayers, but bank shareholders and certain unsecured bondholders will not be protected, and senior management will be removed from their positions.

6. Thoughts on the Us Banking Industry Bankruptcy Caused by the Fed's Interest Rate Hike

First, for banks, maintaining sufficient liquidity is a key task. In any case, if there is insufficient liquidity and the depositors' withdrawal

requirements cannot be paid in time, it will cause depositors to question the bank's ability to maintain operations and trigger panic runs. Once a panic run occurs, it will inevitably lead to bank bankruptcy. This is a situation determined by the bank's own operating attributes and cannot be changed by any technical measures. Therefore, the premise for avoiding panic runs is to maintain sufficient liquidity in the bank. Short-term debt and long-term investment are extremely undesirable. Even if there is a risk-free arbitrage, the market situation is unpredictable and no bank can resist the overall economic environment.

Second, as a bank regulator, when considering raising and lowering interest rates, it is necessary to consider the liquidity of each commercial bank, and provide earlier warning space, and supervise the liquidity reserves of each commercial bank, especially large and key banks in advance. When insufficient, promptly require the bank to make up. As a central bank, when considering raising and lowering interest rates, it is also necessary to be particularly cautious and maintain long-term and forward-looking forecasts. Avoid sharp increases and decreases in interest rates in the short term. Such behavior will inevitably lead to drastic changes in the bank's capital structure and concerns about capital stability. In particular, the herd behavior of the public is difficult to control. Once out of control, it will inevitably lead to systemic risks in the banking industry and pose a challenge to my country's construction of a financial security environment.

Third, the financial risk warning mechanism needs to be further improved. Although the United States has adopted financial regulatory measures such as stress testing, it has not yet discovered potential problems in the country's banks. At present, my country's bank risk assessment is based on an annual cycle, lacks a timely risk identification mechanism, and is not forward-looking enough for risks. It is also necessary to establish real-time risk warning system indicators to promptly discover potential risks in the banking industry.

Fourth, the financial risk early warning mechanism needs to be further improved. Although the United States has adopted financial regulatory measures such as stress testing, it still has not discovered the potential problems of the country's banks. my country's

banking industry needs to follow the requirements put forward in the report of the 20th National Congress of the Communist Party of China to "strengthen and improve modern financial supervision, strengthen the financial stability guarantee system, and bring all kinds of financial activities under supervision in accordance with the law to keep the bottom line of no systemic risk." At present, my country's bank risk assessment is based on an annual cycle, lacks a timely risk identification mechanism, and lacks risk foresight. It is also necessary to establish real-time risk early warning system indicators to promptly discover potential risks in the banking industry.

Fifth, it is necessary to establish a differentiated bank risk management mechanism. There are huge differences in asset size, structure, operating capacity and governance capacity among my country's commercial banks. However, my country's bank risk management methods are relatively broad. The "Interim Measures for the Implementation of Recovery and Disposal Plans for Banking and Insurance Institutions" issued by the China Banking and Insurance Regulatory Commission does not clearly specify differentiated recovery and deterioration management methods for different commercial banks and farm credit cooperatives. It is necessary for my country to further clarify and improve the risk management classification standards, risk assessment mechanisms and disposal measures for banks of different types and sizes, and provide specific and operational risk response measures for different banks by refining the standards.

About the Author: Sun Ran (1979-), male, student of the Advanced Course Training Course for In-service Staff of the School of

Statistics, University of International Business and Economics, intermediate accountant, has been engaged in corporate finance for a long time.

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