

The impact of the collapse of Silicon Valley banks

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Abstract. On March 10 in 2023, Silicon Valley Bank became insolvent, becoming the second largest bank failure in U.S. history. Due to the Federal Reserve's continuous interest rate hikes and an inappropriate asset portfolio, Silicon Valley Bank announced that it would sell US\$21 billion in debt and issue new shares for financing. This move directly led to the collapse of Silicon Valley Bank. There was a serious run on small and medium-sized banks in the United States, stock prices plummeted, and the U.S. financial market experienced severe turmoil. This essay analyzes the reasons for the collapse of Silicon Valley Bank, its impact, and the inspiration that the collapse of Silicon Valley Bank brings to us.

Keywords: Silicon Valley Bank; Fed Raises Interest Rate; Bank Run.

1. Introduction

Silicon Valley Bank, referred to as SVB, was founded in 1983 and listed on NASDAQ in 1988. From the name of Silicon Valley Bank, we can know that its main customers are startups located in Silicon Valley. Some big banks believed that startups made money quickly, but the risks were too high, so they were unwilling to provide deposit and loan services to these startups. So Silicon Valley Bank successfully seized this market and grew together with Silicon Valley. According to Silicon Valley Bank's financial report for the fourth quarter of 2022, nearly half of technology and life sciences startups have become Silicon Valley Bank's customers.

From 1988 to the end of 2022, Silicon Valley Bank's stock price increased more than 700 times, with an average annualized return of more than 20%. It has been named AMERICA'S BEST BANKS by Forbes for five consecutive years since 2019. Between 2020 and 2021, the historical deposit of SVB increased from more than 60 billion US dollars to more than 190 billion US dollars.

2. Reasons for the collapse of Silicon Valley Bank

2.1. Indirect reasons

2.1.1. Purchase large quantities of long-term fixed income securities

According to the requirements of the Federal Reserve, banks need to invest most of their money in liquid asset accounts, which are assets with high liquidity and almost no risk, usually Treasury bonds or high-quality corporate bonds. In 2020, the Federal Reserve cut interest rates, and market interest rates were very low. The interest rate on two-year Treasury bonds was less than 0.2%, and the interest rate on 30-year Treasury bonds only reached 1.5%. Therefore, in order to pursue higher yields, Silicon Valley Bank will start from 2021, began buying large amounts of long-term bonds. From 2021 to 2022, nearly two-thirds of Silicon Valley Bank's new 30 billion deposits will be used to purchase long-term income bonds. Such investments bring huge risks to Silicon Valley Bank.

2.1.2. The Federal Reserve keeps raising interest rates

The securities held by Silicon Valley Bank account for 55% of its total assets, the highest among all banks in the United States. 14% of Silicon Valley Bank's 117 billion bond investments are

government bonds, and the main 68% is invested in RMBS and CMBS. MBS is mortgage-backed security. One of the most important characteristics of MBS is its negative convexity .

Risks increase as interest rates increase. In other words, the more the Fed raises interest rates, the longer the duration of MBS will be, the greater the risk will be, and the worse the losses will be. At the end of 2021, the average duration of Silicon Valley Bank was only 4.1 years, but at the end of 2022, the duration had reached 6.2 years, and the risk had increased by nearly 50%.

2.1.3. Serious risk control loopholes

As the Federal Reserve continues to raise interest rates, the duration of Silicon Valley Bank's investment portfolio has been continuously lengthened. However, Silicon Valley Bank did not accurately predict the extent of the Fed's interest rate hike. At the same time, the CRO position of Silicon Valley Bank has been vacant after April 2022, and no one is conducting risk management. Therefore, Silicon Valley Bank did not take measures to hedge risks, hoping that the market would adjust itself. In the end, Silicon Valley Bank's losses in 2022 were as high as US\$15 billion. However, in the past thirty years, Silicon Valley Bank's total profit was only US\$10 billion.

2.2. Direct reasons

2.2.1. selling liabilities and financing

Although the loss is as high as 15 billion US dollars, the total value has not reached 10% of the total savings. In principle, all Silicon Valley Bank purchases are bonds, and the current losses are temporary. That is to say, as long as depositors continue to save money, it is still very possible to turn the crisis around. However, at the end of 2022, market liquidity continued to tighten, technology companies laid off a large number of layoffs, and startup financing began to decline rapidly, with continuous withdrawals from Silicon Valley Bank^[2]. In 2022, Silicon Valley Bank's deposits dropped from 200 billion to 175 billion. In order to avoid losses, Silicon Valley Bank borrowed US\$30 billion from Federal home loan banks to barely fill the hole.

However, in 2023, in order to avoid continuing high-interest loans and continuing savings outflows, Silicon Valley Bank announced on March 8 that it would sell US\$21 billion in debt, achieve a loss of US\$1.8 billion, and at the same time issue new ordinary shares and Preferred shares, plans to raise \$2.25 billion. This move undoubtedly tells everyone that Silicon Valley Bank is now losing money and can only sell off assets to maintain operations. On March 9, Silicon Valley Bank's stock plummeted more than 60%, Moody's rating was downgraded to junk status, and the stock was suspended immediately. Most startups began withdrawing their savings from Silicon Valley Bank. In just one day, \$42 billion, nearly a quarter of Silicon Valley Bank's savings attempted to be withdrawn. The bank run occurred, Silicon Valley Bank collapsed.

2.2.2. Herd behavior

The herd behavior effect among entrepreneurs similar to Silicon Valley Bank also played a role in fueling the situation. Due to the impact of the global epidemic after 2020, financial markets are in danger of collapse once they experience a little shock.

Just two days before Silicon Valley Bank went bankrupt, Silvergate Bank went bankrupt. Silvergate Bank is nearly one-tenth smaller than Silicon Valley Bank, with savings of nearly 10 billion U.S. dollars. Its customers mainly face cryptocurrency companies and exchanges. Due to the bleak cryptocurrency business in 2022, investors have turned away from cryptocurrency trading. Investors withdrew its money from cryptocurrency exchanges, and exchanges withdrew its money from Silvergate Bank. The amount of savings fell from 13.2 billion to 3.9 billion, causing a serious run and bankruptcy.

The mainstream view does not believe that the collapse of the two banks is substantially related, but when Silvergate Bank collapsed, Silicon Valley investors became vigilant. At the same time, most investors in Silicon Valley are highly sensitive to risks and news-clever. Once they hear that Silicon

Valley Bank has operational problems, they immediately call on a large number of investors to withdraw their capital, creating a herd behavior. In the process of encouraging other investors to withdraw their capital, Silicon Valley Bank has been officially declared bankrupt.

In fact, this is also an important problem in the banking system. This kind of panic is very scary. Banks will try their best to hide their problems from investors in the market, but this will only cause more panic in the market. Therefore, there will be a polarization phenomenon. The banking industry will not have accidents at will. Once an accident occurs, the scale will be huge.

3. Bankruptcy affects

3.1. Direct impact: serious bank runs and stock market crash

On March 9, Silvergate Bank announced its bankruptcy. On March 10, Silicon Valley Bank, dozens of times larger than Silvergate Bank, became insolvent, becoming the second largest bank failure in U.S. history.

On March 10, affected by the collapse of Silicon Valley Bank, European and American stock markets fell simultaneously. The market value of the four largest U.S. banks fell by approximately \$52 billion. The stock prices of JPMorgan Chase, Bank of America, Wells Fargo, and Citigroup fell by 5.41%, 6.2%, 6.18%, and 4.1% respectively, with market value losses of US\$22 billion, US\$16 billion, US\$10 billion, and US\$4 billion respectively.

Small and medium-sized banks with relatively concentrated customers were greatly affected. The stocks of small and medium-sized banks in the United States generally plummeted by 20% to 80%, and the stocks of more than 20 banks were suspended. All companies in the market related to these two banks have been implicated.

At this point, the incident evolved from the collapse of one bank, to panic in the entire market, and to a credit crisis for small and medium-sized banks.

As you can imagine, all the medium and small banks in the United States are suffering from serious bank runs. Signature bank, the twentieth largest bank in the United States, also has many cryptocurrency customers, also announced its bankruptcy and became the third largest bank failure in U.S. history. All this happened in just one week. Three banks have experienced explosions one after another, and potential risks to the U.S. banking system have also begun to emerge.

3.2. Indirect impact

3.2.1. The U.S. dollar index and U.S. bond yields continue to fall

The collapse of Silicon Valley Bank has caused market confidence to continue to decline. At the same time, capital flows have also undergone drastic changes, causing huge fluctuations in the U.S. dollar index and U.S. dollar yields.

1. USD Index

The U.S. Dollar Index is a measure of the U.S. dollar's exchange rate movements against a basket of major trading partner currencies, usually calculated by comparing the U.S. dollar's exchange rates with other major currencies (such as the euro, Japanese yen, British pound, Canadian dollar, Swiss franc, Swedish krona, etc.). Changes in the U.S. dollar index reflect the exchange rate trend of the U.S. dollar in the international market and can be used to evaluate the strength or weakness of the U.S. dollar relative to other currencies.

The collapse of Silicon Valley Bank damaged market investors' confidence in the U.S. financial system and triggered risk aversion. Investors turned to other currencies for safe haven, causing the U.S. dollar index to weaken in the short term. On March 10, 2023, the U.S. dollar index fell

significantly by 0.68%, and fell sharply by 0.95% to 103.5985 on March 13; from March 16 to 21, the U.S. dollar index fell by a cumulative 139 points to 103.36.

2. USD yield

U.S. dollar yield refers to the rate of return earned by investing in U.S. dollar assets and is usually related to bond yields or stock yields. The performance of U.S. dollar yields reflects investors' demand and expectations for U.S. dollar assets, and is also affected by macroeconomic factors, interest rate policies, geopolitical risks and other factors.

The collapse of Silicon Valley Bank had an impact on the U.S. financial market, triggering a sharp increase in market volatility and a decline in risk appetite. At the same time, the collapse of Silicon Valley Bank caused the market to worry about the U.S. economic outlook, and U.S. bond yields also collapsed rapidly. The 2-year U.S. Treasury bond yields, which are most sensitive to interest rate expectations, plummeted, falling by more than 10% in the three trading days from March 12 to 14. 100 basis points, once jumping from around 5% to around 3.9%, the largest drop since "Black Monday" in 1987. As of March 14, the 5-year U.S. Treasury yield fell 24.4 basis points to 3.717%, and the 10-year U.S. Treasury yield fell 10.2 basis points to 3.587%.

3.2.2. The unit price of crude oil plummeted and the price of gold surged

The collapse of Silicon Valley Bank could have an impact on crude oil prices and gold prices. Although the direct correlation is less obvious, the collapse of Silicon Valley Bank triggered panic in the market and caused investors to seek safe-haven assets. When market sentiment is low, investors often turn to precious metals such as gold as safe-haven assets, which can push gold prices higher. In March 2023, the price of gold rose sharply, with the weekly increases of New York gold futures and London spot gold prices being 6.5% and 6.3% respectively.

At the same time, the collapse of Silicon Valley Bank caused the dollar to weaken as markets may view risks to the U.S. financial system. Crude oil is priced in U.S. dollars, and if the U.S. dollar weakens, it usually causes the price of crude oil to rise because the cost of U.S. dollars required to purchase crude oil increases. International crude oil fell by more than 11% in a single week, and gold prices hit a new high in a year. The financial risks caused by Silicon Valley Bank have had a significant impact on the commodity market. From March 13 to 17, 2023, international oil prices continued to plummet, falling to the lowest value since December 2021. As of the close on March 17, WTI crude oil futures prices fell by 2.36%, and Brent crude oil futures prices fell by 2.32%, with weekly declines of 12.9% and 11.7% respectively.

Gold and crude oil prices are also affected by global economic conditions. The collapse of Silicon Valley Bank may trigger fluctuations in global financial markets and bring uncertainty to the global economy, which will in turn affect gold and crude oil prices.

4. Will it lead to an economic crisis?

Will the collapse of Silicon Valley Bank cause a financial crisis similar to the 2008 subprime mortgage crisis? This issue is a common concern after the collapse of Silicon Valley Bank.

The subprime mortgage crisis in 2008 was caused by the low interest rate environment that stimulated the formation of real estate bubbles, and the outbreak of financial risks caused by the interaction of high-risk subprime mortgages, loan derivatives, and the failure of credit rating agencies. Compared with the collapse of Silicon Valley Bank in 2023, the leverage is much greater and the degree of market distortion is greater^[3]. It has almost distorted the entire financial market and has consequences for the entire Wall Street investment banks, hedge funds, insurance companies, asset management companies, etc. dramatic impact.

In 2023, it was just Silicon Valley Bank's investment losses that caused a bank run. The main purchase was MBS. The most important thing was only depositors, and it did not distort the market.

At the same time, the overall economic environment is also different. The subprime mortgage crisis in 2008 was an overheating economy, while in 2023 Silicon Valley Bank was experiencing a rapid economic contraction.

Things continued to escalate, and in early April 2023, Credit Suisse collapsed^[1]. As we have discussed before, the collapse of Silicon Valley Bank has gradually evolved into a credit crisis for small and medium-sized enterprises in an environment of tight liquidity.

As of now, I think it will not produce a financial crisis similar to the 2008 subprime mortgage crisis.

5. Inspiration from the collapse of Silicon Valley Bank

Silicon Valley Bank has always been regarded as an excellent commercial bank and an industry benchmark for investment and loan linkage. By sorting out the process and reasons for the collapse of Silicon Valley Bank, we can find that some new risk characteristics have emerged in this crisis. Some hidden risks that are not usually taken seriously can also explode with amazing destructive power in extreme market environments. This It brings new enlightenment for us to think about how to build a sound commercial bank.

5.1. Strengthening asset portfolio management

Commercial banks should attach great importance to the risk of mismatching assets and liabilities under cyclical fluctuations in the market monetary environment. Through asset portfolio allocation, they can combine risk-free assets (such as treasury bonds) with high-risk assets (such as stocks) to reduce the overall risk level and avoid situations like Silicon Valley Bank also invests most of its assets in long-term liabilities^[4]. This diversification strategy helps protect investors from large losses from a single asset.

Asset portfolio allocation is an effective method of managing risks. Commercial banks should help investors hedge risks and achieve long-term stable investment growth by diversifying investments, maximizing returns and balancing risks. During the investment process, investors should make appropriate asset allocations based on their own investment goals, risk tolerance and time perspective to better hedge investment risks and avoid liquidity problems caused by sudden changes in the currency environment experienced by Silicon Valley Bank.

5.2. Avoid relying on the same type of customer groups

Silicon Valley Bank's customer base is mainly technology and life science startups in Silicon Valley. Silvergate Bank's main customer groups are cryptocurrency companies and exchanges, and over-reliance on the same type of customers may increase risks. If this type of customer suffers losses due to an economic downturn, policy changes or other unforeseen circumstances, the bank's profits and asset values may be affected.

It can be seen from the collapse of Silicon Valley Bank that the economic behavior of the same type of customer group will have the same characteristics^[5]. When the external environment has an adverse impact on a certain type of customer group, this impact will be transmitted to commercial banks, and When other banks compete, banks can expand their market share and gain a competitive advantage by offering different types of products and services. If banks rely only on one particular type of customer, they may miss out on other opportunities. Therefore, commercial banks must strengthen risk management of this new type of customer concentration, and business development cannot rely on a single customer group.

6. Conclusion

The collapse of Silicon Valley Bank illustrates how rapidly a bank can fail when interest-rate risks, asset-liability mismatches, and weak risk management collide. Although SVB had long been a major

financial partner for technology startups, its heavy investment in long-term securities and inadequate hedging left it highly exposed to the Federal Reserve's rate hikes. The bank's attempt to raise capital triggered widespread panic and a rapid bank run, leading to severe market volatility and broader financial spillovers.

While the event did not develop into a systemic crisis like 2008, it highlights the need for stronger risk controls, diversified customer bases, and prudent asset-liability management within commercial banks.

Acknowledgements

The author gratefully acknowledges the academic guidance from faculty at Nanjing University of Science and Technology.

References

- [1] Md Akhtaruzzaman, Sabri Boubaker, John W. Goodell, Did the collapse of Silicon Valley Bank catalyze financial contagion? *Finance Research Letters*, Volume 56, 2023, 104082, ISSN 1544-6123
- [2] Angelidis T, Tessaromatis N. Global equity country allocation: An application of factor investing[J]. *Financial Analysts Journal*, 2017, 73(4): 55-73.
- [3] Boubaker S, Goodell J W, Pandey D K, et al. Heterogeneous impacts of wars on global equity markets: Evidence from the invasion of Ukraine[J]. *Finance Research Letters*, 2022, 48: 102934..
- [4] Caiazzo E, Zazzaro A. Bank diversity and financial contagion[M]. CSEF, Centre for Studies in Economics and Finance, Department of Economics, University of Naples, 2023.
- [5] Akhtaruzzaman M, Boubaker S, Goodell J W. Did the collapse of Silicon Valley Bank catalyze financial contagion?[J]. *Finance Research Letters*, 2023, 56: 104082.
- [6] Pandey D K, Hassan M K, Kumari V, et al. Repercussions of the Silicon Valley Bank collapse on global stock markets[J]. *Finance Research Letters*, 2023, 55: 104013.
- [7] Al-Sowaidi A S S S, Faour A. Causes and consequences of the Silicon Valley Bank collapse: Examining the interplay between management missteps and the Federal Reserve's floundering decisions[J]. *Journal of World Economic Research*, 2023, 12(1): 38-46.
- [8] Corbet S, Larkin C J. The Implications of the Silicon Valley Bank Collapse[J]. Available at SSRN 4640800, 2023.
- [9] Corbet, S., Goodell, J. W., & Günay, S. (2020). Co-movements and spillovers of oil and renewable firms under extreme conditions: New evidence from negative WTI prices during COVID-19. *Energy Economics*, 92, 104978.
- [10] Batten, J. A., Choudhury, T., Kinatader, H., & Wagner, N. F. (2022). Volatility impacts on the European banking sector: GFC and COVID-19. *Annals of Operations Research*, 1-26.