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An Study on the Causes and Consequences of the SVB Collapse

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Abstract. This comprehensive study delves into the nuanced causes and repercussions surrounding the failure of Silicon Valley Banks(SVB), scrutinizing both external and internal factors. Internally, the demise is attributed to mismanagement of assets and liabilities, coupled with flaws in the business model. Externally, the Federal Reserve's interest rate hike and relaxed financial regulations during the Trump era are identified as pivotal triggers. Post-bankruptcy, the rapid acquisition and sale of SVB, First Total Bank, and Signature Bank temporarily alleviate risks within the US banking sector. Regulatory authorities respond by fortifying rules, enhancing industry resilience but simultaneously tightening loan conditions, potentially intensifying economic downturn pressures. Presently, market confidence is on the mend due to regulatory influence, limiting systemic risks. However, the looming 2023 interest rate hike poses a threat, particularly with tight monetary policies. Small and medium-sized US banks, heavily invested in commercial real estate, face heightened vulnerability, potentially precipitating a downward spiral in property prices. Drawing lessons from Lehman Brothers, the study advocates for a balanced approach to monetary policy, emphasizing financial stability, improved risk management by regulators, and ongoing efforts to avert and mitigate future financial crises.

1 Introduction

In 2007, as the US housing market began to collapse, the value of subprime mortgages fell sharply. The value of Lehman's assets began to fall sharply because of its large holdings of assets related to real estate. In 2008, with the tightening of the US credit market and the further decline of asset value, Lehman Brothers faced great financial pressure, which directly caused investors' confidence in Lehman Brothers to begin to falter, resulting in a sharp decline in its stock price in the short term [1]. On September 15 of the same year, Lehman Brothers formally filed for bankruptcy protection, which was one of the largest in U.S. history. The systemic risk generated by the failure of Lehman Brothers, which at the time triggered great uncertainty and panic in global financial markets and caused the US credit market to almost freeze up, went far beyond this. This panic quickly spread to the entire financial system because of the close linkages between financial institutions. And the effects were not confined to the United States, but quickly spread around the world, causing a sharp slowdown in economic growth and rising unemployment around the world. Numerous governments, such as China's, have implemented bailout plans to strengthen their financial systems. Additionally, the worldwide economic downturn has exposed underlying issues within the global financial structure. After the crisis, the US government passed a number of laws and policies, such as the Dodd-Frank Act, to strengthen financial regulation and reduce future systemic risks [2].

Unfortunately, the United States has once again experienced a tragic event after 15 years. On March 8st, 2023, SVB Financial Group made an announcement regarding the sale of assets worth $21 billion which resulted in a financial loss of $1.8 billion for the company. This turn of events is disheartening. Additionally, they issued $15 billion in convertible bonds and emergency new shares to raise $2.25 billion [3]. Naturally, this announcement garnered significant attention from the market. The unconventional actions taken by SVB raised concerns among depositors who feared potential risks faced by these institutions. Consequently, many depositors began withdrawing their funds due to liquidity concerns. By March 9st, client requests for cash amounted to a staggering $42 billion and panic selling ensued in relation to the bank's stocks. As a result of insolvency issues on March 10th , According to a study conducted by Ali et al., SVB has recently encountered financial challenges and is currently facing the possibility of closure, as indicated by the California Department of Financial Protection and Innovation [4]. This development not only marks the largest bank downfall since the 2008 financial crisis but also emerges as one of the most notable failures in American history. Shortly after this crisis at SVB unfolded within two months' time frame; First Total experienced its own liquidity run which led to its swift takeover. It is important to note that First Total was even

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larger and more diversified than No.16 SVB whose collapse initiated a chain reaction affecting larger and more influential banks. Given this context, this paper aims to delve into an extensive analysis exploring both causes and consequences surrounding the crisis at SVB while examining potential systemic risks that may arise from such failure events [5].

2 Causes of the SVB collapse

Based on the information provided by the Federal Deposit Insurance Corporation (FDIC),there are more than 4,700 banks in the United States, including many "problem banks" with weak financial, operational or managerial performance. Among these banks, SVB became the first large bank to have a crisis, which was closely related to its own asset-liability management problems.

Through the analysis of the interest rate environment, the author found that the continuous and rapid interest rate hike measures of the Federal Reserve led to the rapid tightening of market liquidity, especially the financing environment of start-ups had a serious impact. During 2020-2021, SVB achieved rapid growth in the scale of assets and liabilities, with assets growing from US $71 billion in 2019 to US $211.5 billion in 2021, including a single annual growth rate of 83% in 2021, and the amount of liabilities rose significantly, going up from US $64.4 billion in 2019 to reach a staggering US $194.9 billion by 2021.This change benefited from the quantitative easing policy of the Federal Reserve, the significant increase in market risk appetite, and the enhanced financing capacity of scientific and technological innovative enterprises [6]. In these two years, these enterprises have obtained a large amount of funds.

2.1 Internal factors

When analyzing the liability structure of SVB, it can be seen that it has a clear difference compared to other banks. SVB 's liabilities are relatively short-term and concentrated, and its deposits account for a large proportion of liabilities, exceeding 90% in some years. Demand deposits accounted for 65 percent of the total in 2021, three times that of 2019. Of the time deposits, $5.586 billion came from domestic customers, of which 83 percent were due within three months. In addition, the industry distribution of deposit customers of SVB is also very concentrated. By the end of 2022, 63% of deposits come from technology, life science and health enterprises, 13% from PE/VC institutions, and only 6% from private banks, which indicates that the customer group of SVB is highly homogeneous, mainly science and technology innovation enterprises or venture capital institutions. Since 2021, SVB has experienced a large-scale increase in debt. However, due to the very low interest rate in the first two years, enterprises' demand for time deposits is not strong, and the deposit industry concentration is too high, science and technology innovation enterprises have a high demand for funds in the start-up period and are more inclined to use demand or short-term deposits, resulting in the short-term debt structure of SVB. It is worth noting that SVB has benefited significantly from the downward interest rate cycle, achieving rapid expansion in the past two years and ranking 14th in debt in the United States in 2021. However, as the rate hike cycle arrives, it is the most liquid demand deposits that are hit first, with SVB seeing a $45.1 billion decline in demand deposits in 2022. With the rapid growth of debt scale, SVB's assets have also increased significantly, with a compound growth rate of nearly 40% in the past five years, with asset growth doubling in 2021. However, in contrast, the growth rate of customer loans and advances was slower than that of total assets, with its proportion falling from nearly 50% in 2018 to 35% in 2022, indicating that although the rapid growth of liabilities brought a large cash inflow, there was not enough loan demand to accept this cash, resulting in a large amount of idle funds. By combining the financial statements of SVB, it can be found that for these idle funds, the bank adopted a relatively aggressive investment strategy. Between 2020 and 2021, SVB's asset growth came mainly from two types of investments: available-for-sale investments, which doubled in 2020; The second is to hold maturing investments. As of the end of 2022, 94% of held-to-maturity (HTM) assets were assets with maturities of more than 10 years, while mortgage-backed securities (MBS) assets had negative convexity, that is, as interest rates rose, the duration of assets was extended, resulting in large unrealized losses.

SVB saw demand deposits fall by $45.1 billion in 2022 as the funding environment for startups became tougher at the start of the 2022 rate hike cycle, causing them to start withdrawing deposits to maintain daily operations. In order to replenish its liquidity, SVB increased its short-term borrowing by $13.5 billion, but this was not enough to offset the loss of deposits on the liability side, leading the bank to sell assets. In addition, most of SVB's deposit customers are corporate customers, whose accounts are insured up to $250,000. But the majority of SVB's deposits aren't insured, with 88% of them uninsured as of 2022, making it more vulnerable to a run in the event of liquidity problems. On the asset side, due to the large increase of SVB's holdings of available for sale (AFS) and hold to maturity (HTM) assets in the past two years, when the interest rate hike cycle arrives, the duration of these two types of assets is rapidly extended, resulting in a large number of unrealized losses, which further leads to SVB triggering a chain reaction in the market when selling assets.

SVB 's business model is highly linked to the technology innovation industry and commercial real estate. The technology innovation sector is characterized by a high level of risk, whereas the growth of commercial real estate is closely tied to the extent of economic well-being, both of which are extremely sensitive to changes in the economic cycle. After the outbreak of the pandemic, the demand for remote working surged, which promoted the prosperity of the technology and innovation industry, with a large amount of funds flowing in and converted into bank deposits [7]. However, with the aggressive interest rate hike by the

Federal Reserve and the slowdown of the US economic growth, the boom period of the technology innovation industry and venture capital ended, and the technology innovation companies began to consume deposits to maintain operations, resulting in a rapid loss of bank deposits. At the same time, remote working has reduced demand for commercial real estate, especially office buildings, leading to a marked decline in U.S. commercial property prices last year. SVB is highly related to these industries, and its customer base covers nearly half of the high-tech. SVB's operations are closely intertwined with science and technology innovation enterprises as well as venture capital funds, particularly those in the United States that receive support from venture capitalists, providing a full range of services from financing to investment and merger for these enterprises, and building a service chain of the whole life cycle. In order to improve returns and realize risk hedging, SVB also innovated the business model of "investment and loan linkage", that is, while providing loans to enterprises, it made equity investments directly or indirectly, or lent to investment funds to magnify returns. This model effectively reduces information asymmetry and broadens the income channel. However, this also makes the investment end closely bound to the science and technology innovation enterprises, which lays a hidden danger for the risk exposure of SVB and becomes an important reason why SVB is the first to experience a crisis among many regional banks.

2.2 External factors

In early 2020, the global spread of the COVID-19 pandemic prompted the Federal Reserve to take action in response to concerns about both public health and the economy. In March, they applied reductions in interest rates of 0.5% and 1% correspondingly, followed by initiating a new round of quantitative easing at the end of that month. Quantitative easing involves the central bank purchasing significant amounts of national bonds or medium- to long-term bonds in order to inject liquidity into the market and maintain low interest rates, thereby stimulating economic growth. This policy is often colloquially referred to as 'increasing money supply' within financial circles. By increasing market liquidity through quantitative easing, it encourages businesses to seek financing opportunities, thus fostering a positive economic cycle. To ensure low interest rates are sustained, central banks typically acquire large volumes of long-duration bonds which helps alleviate liquidity pressures. Compared to conventional monetary policies, quantitative easing is more assertive and can potentially result in excessive money circulation leading to inflationary issues; therefore countries tend to exercise caution when implementing such measures. The United States continued its implementation of this round of quantitative easing until late 2021. Throughout these two years marked by quantitative easing (QE), there was a notable surge in inflation levels within the United States with consumer price index (CPI) reaching its peak at 9.1% year-on-year in July 2022.

Affected by persistently high inflation, the Federal Reserve began a cycle of rapid interest rate increases in early 2022. In one year, the federal funds rate was raised from 0.25% to 5.25%, a cumulative increase of 5 percentage points. Such continuous and rapid interest rate hikes led to the deterioration of financing conditions, especially for technology and innovation enterprises, which became extremely severe. With external financing channels blocked, these companies can only supplement the cash flow of daily operations by withdrawing bank deposits, which has triggered a wave of withdrawals by science and technology innovation companies. Initial public offerings in the U.S. totaled just $21.8 billion in 2022, compared with the $85.4 billion raised in 2020 and the $153.5 billion raised in 2021. In addition, the US banking industry also saw negative deposit growth in 2022, with $17.77 trillion of deposits outstanding at the end of the year, down 0.98 percent year on year. On the whole, the completely different monetary policies in the United States in the past three years have resulted in excessive liquidity in the early stage, and a large number of funds have poured into technology and innovative enterprises. However, these enterprises have a long return on investment period, and after the deterioration of financing environment, they can only continue to replenish working capital by withdrawing deposits, which in turn affects the stability of the liability side of the bank.

The deregulation of financial regulations under Trump laid the groundwork for the crisis, mainly in the following aspects:

First, a relaxed regulatory culture: In response to the Economic Growth, Deregulation, and Consumer Protection Act of 2018, the Federal Reserve's regulatory culture shifted to focus more on reducing the burden on banks and requiring more evidence in the regulatory decision-making process, which led supervisors to tend to delay decisions or even avoid actions. At the same time, the financial and human resources allocated to the financial supervision department also appear insufficient.

Second, regulatory easing: In July 2018, the Federal Reserve raised its definition of a "large bank" from $50 billion to $100 billion in total assets, a change that delayed SVB's inclusion in the "large bank" category by three years.

Third, poor regulatory implementation: Although the Federal Reserve upgraded SVB's regulatory classification from "regional bank" to "large Bank" in May 2021, it did not send the results of its first regulatory rating to SVB until August 2022, which contained important information about deficiencies in SVB 's governance and internal controls. Because of the long transition period for regulatory upgrades, the first stress test that SVB was supposed to undergo after it was upgraded to a large bank was not conducted until the time of its failure.

Together, these factors constituted weaknesses in the financial regulatory system that set the stage for SVBs and the financial crisis that followed.

3 Consequences of the SVB collapse

The regional banks in the United States were significantly affected by the unexpected downfall of SVB. In addition, affected by the rapid depletion of cash flow of SVB, the US financial market experienced severe turmoil. Many banks represented by the First Total Bank achieved rapid expansion due to excessive reliance on unstable financing sources, which were quickly identified as potential risk points by the market. In a sign that the risk of a run is spreading, shares in the banks tumbled and trading in several were suspended. The downfall of SVB was not just a single incident, but revealed deeper problems across the financial system.

Affected by the downfall of SVB and the failure of Signature Bank in New York and First Total Bank faced severe crises. In recent years, Signature Bank has been heavily involved in crypto assets, while First Total Bank primarily focuses on commercial real estate lending [8]. To attract California's high net worth population, First Total Bank offers loans at significantly lower interest rates compared to the industry average. These distinctive characteristics contribute to why these three banks were among the first to encounter risks among regional banks [9]. Notably, the failure of First Total Bank became the failure of the bank that ranks second in terms of size in American history and played a significant role in triggering a chain reaction of systemic risk following SVBs' collapse. Unlike SVB's sudden collapse, market scrutiny closely monitored First Total Bank's risk exposure from March until its closure in May [10]. Consequently, market analysis gradually leaned towards an inevitable outcome - the bank's collapse. First Total Bank, established in 1985 in San Francisco, California, operates as a state non-Federal Reserve member bank under the supervision of both the FDIC and the California Financial regulator. Its core focus lies in offering deposit and loan services for residential, commercial, and personal purposes to affluent individuals. Additionally, it provides private wealth management solutions. As of the conclusion of 2022, First Total Bank ranked as the fourteenth largest financial institution in the United States with total assets amounting to $212.6 billion and deposits totalling $176.4 billion; uninsured deposits accounted for approximately 67.4% of this figure. Unfortunately, following SVB's collapse, First Total experienced a significant decline in its stock price along with a surge in deposit withdrawals due to substantial losses incurred from mortgage and securities assets. The bank witnessed an alarming decrease from $123 to $12 per share between March 1st and March 20st - representing a staggering drop exceeding 90%. On April 24th, market concerns were further exacerbated when First Total Bank disclosed that it had suffered a loss of $100 billion worth of deposits during Q1. Consequently, its shares plummeted to $3.50 between April 25st and April 28th - signifying an astonishing depreciation of value by approximately 97% thus far into the year 2023.

First Republic Bank made several attempts to save itself during the crisis, but the situation was difficult to reverse. On March 16, 2023, JPMorgan Chase and 10 other large banks jointly injected $30 billion of deposits into First Total Bank to stabilize market confidence. However, the money was nowhere near enough to compensate the bank for rapidly losing deposits. To obtain the necessary liquidity, First Total borrowed from several sources: $63.5 billion from the Federal Reserve's discount window, $13.8 billion from the Bank Time Financing Program (BTFP), and an additional $14.1 billion from the Federal Home Loan Bank. By the end of the first quarter, about 45 per cent of the bank's financing had been replaced by government funds, up from just 7 per cent at the end of the previous year, according to market estimates. The funds were funded at a cost of between 4.8 per cent and 5.0 per cent, well above the bank's deposit taking cost of 1.4 per cent, while its asset-side return was just 3.7 per cent. This meant that although First Total was still able to eke out a living on government borrowing, it was no longer profitable and would face mounting losses if it continued to operate, making liquidation a highly likely outcome. This shows the severity of the situation of the First Republic Bank in the crisis, even with the support of the government and other banks, it was difficult to restore its financial health.

In the emergency case of First Total Bank's collapse, the U.S. government did not provide full deposit protection for the bank, but adopted a cost-sharing approach to facilitate its takeover. Before the collapse, First Total approached multiple potential buyers, but because even a free purchase would mean taking a large capital loss, no bank was willing to buy First Total on market terms. To find buyers quickly and reduce volatility in the market, regulators had to step in and cover some of the costs [11]. On May 1, 2023, the California Department of Financial Protection and Innovation announced the closure of First Total Bank and appointed the Federal Deposit Insurance Corporation (FDIC) as receiver. On the same day, the FDIC and JPMorgan reached a buy-and-take agreement. Under the deal, JPMorgan agreed to take on $92 billion in deposits, $173 billion in loans and $30 billion in securities from First Concord. The FDIC will provide loss-sharing on the home mortgage and commercial real estate loans and support JPMorgan with about $50 billion in five-year fixed-rate financing [12]. The cost borne by the FDIC is estimated at $13 billion. This action demonstrated the flexibility and determination of supervisory authorities in responding to major banking crises, as well as their key role in stabilizing financial markets and protecting the interests of depositors.

In order to prevent the bankruptcy of SVB from becoming the trigger for serious systemic risks, the US government together with relevant regulators quickly discussed the feasibility of a new round of financial regulatory reform, hoping to further strengthen the resilience of the banking industry through financial regulatory reform. But such tightening could constrain bank lending, adding to downward pressure on the economy.

At a U.S. Senate hearing in May to review financial regulation, the mentioned entities include the Federal Reserve, the Federal Deposit Insurance Corporation, and the Office of the Comptroller of the Currency, and the California and New York state financial regulators all expressed their determination to establish stronger oversight and regulatory frameworks. This was a direct response to the recent banking crisis, particularly the failures of SVB and First Total Bank. In July, Mr. Barr, the Fed's vice chairman for financial supervision, proposed reforms centered on strengthening bank capital levels, which are expected to increase capital ratios by about 2 percentage points for banks with $100 billion or more in total assets. The Fed also plans to remove certain regulatory exemptions put in place in 2019, reinstate a requirement that all banks with $100bn in total assets take losses on available-for-sale securities into account when calculating their capital needs, expand the coverage of stress tests and speed up implementation of measures such as Basel III. Greater capital discipline would be good for the resilience of the US banking sector, particularly for those previously under-regulated banks with assets in the $100bn - $250bn range. However, higher capital adequacy ratios may also limit the lending capacity of banks, especially during economic downturns, which may have certain procyclical effects. Although it may take a long time from the proposal to the actual implementation, the release of reform proposals has already started to influence the behavior of the banking sector, which is trying to strengthen capital accumulation and adopt a more prudent attitude in granting loans. These measures can also help prevent future financial crises and improve the stability and safety of the banking sector as a whole.

4 Conclusion

This study provides an in-depth analysis of the causes and consequences of the failure of SVB. For the reasons of bankruptcy, this paper analyzes from two aspects: external factors and internal factors. This paper argues that the internal factors behind the bankruptcy and collapse of SVB are mainly due to the poor management of its assets and liabilities, and some shortcomings in its business model. As for the external factors, this paper believes that the interest rate hike by the Federal Reserve and the financial regulation relaxation in the Trump era are the main reasons for the bankruptcy of SVB. As for the consequences of the bankruptcy of SVB, this paper argues that after the rapid takeover and sale of SVB, First Total Bank and Signature Bank, the risks of the US banking industry are cleared in the short term. At the same time, the US regulatory authorities further strengthened the regulatory rules after the bankruptcy of SVB, which effectively enhanced the resilience of the banking industry, but also encouraged banks to tighten loan conditions, objectively increasing the downward pressure on the economy. However, for now, the confidence of the US financial market has gradually recovered under the influence of regulatory policies, risk contagion has been effectively suppressed, and the probability of systemic risks breaking out in the short term is small.

Indeed, the certainty that the Fed will continue to raise interest rates in 2023 could pose further downside risks to the economy, especially in the current context of tight monetary policy. Due to their large exposure to the commercial real estate sector, small and medium-sized banks in the United States are particularly sensitive to the adjustment of commercial real estate prices during the economic downturn, which will increase the financial pressure of banks if there is a significant adjustment in the valuation of commercial real estate in the future. Already, some regional banks are selling commercial-property loans at a discount to stem losses after the Silicon Valley collapse. If there is a sharp correction in commercial property valuations, more US banks could sell assets at a loss, which in severe cases could lead to a downward spiral in commercial property prices that could be a trigger for systemic risk. It can be seen from the cases of Lehman Brothers Bank and SVB that the crisis of regional banks in the United States cannot be avoided only by strengthening supervision. The most fundamental solution lies in properly handling the relationship between monetary policy and financial stability, and solving the drastic adjustment of macro environment caused by the relaxation and tightening of financial policy. And give greater consideration to the maintenance of financial stability during significant shifts in monetary policy. This requires taking into account the impact on financial stability in the formulation and implementation of monetary policy, as well as measures to reduce it if necessary. At the same time, regulators need to continuously improve their ability to identify and manage risks and ensure the overall stability of the banking system, so as to prevent and mitigate possible financial crises in the future.

References

1. E. Bouri, R. Nekhili, H. Kinateder, T. Choudhury, FRL, 55, 103845 (2023).
2. M. K. Hassan, M. Kamran, H. G. Djajadikerta, T. Choudhury, PBFJ, 73, 101768 (2022).
3. C. RamíRez, P. A. Shively, JMCB, 44, 433–455 (2012).
4. S. Ali, F. Moussa, M. Youssef, FRL, 58, 104352 (2023).
5. K. Liu, JFEP, 13, 424–441 (2020).
6. M. Akhtaruzzaman, S. Boubaker, A. Sensoy, FRL, 38, 101604 (2021).
7. H. Miyajima, Y. Yafeh, JBF, 31, 2866–2885 (2007).
8. A. Dutta, L. C. Voumik, A. Ramamoorthy, S. Ray, A. Raihan, JRFM, 16, 216 (2023).
9. F. Allen, D. Gale, JPE, 108, 1–33 (2000).
10. M. Pericoli, M. Sbracia, JES, 17, 571–608 (2003).
11. J. A. Batten, T. Choudhury, H. Kinateder, N. Wagner, AOR, 330+335–360 (2022).
12. N. Mansley, Z. Wang, X. Weng, W. Zhang, Int. Rev. Financ. Anal. 86, 102499 (2023).