Proceedings of the 3rd International Conference on Business and Policy Studies
DOI: 10.54254/2754-1169/106/20241605

Lessons from the Collapse of Silicon Valley Bank

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Abstract: The Federal Reserve's consecutive interest rate hikes led to a decline in the prices of US Treasuries and mortgage-backed securities (MBS), which comprised a significant portion of Silicon Valley Bank (SVB)'s asset portfolio. As a result, SVB experienced substantial floating losses, exceeding its owner's equity, creating immense pressure on its assets and liabilities. The analysis also highlights the simple deposit and asset structures of SVB, with a high proportion of demand deposits and a significant allocation to bonds. The aggressive interest rate hikes by the Federal Reserve, coupled with financing difficulties for startups, accelerated deposit consumption and intensified debt pressure for SVB. Furthermore, the article reveals the low coverage rate of deposit insurance, particularly at SVB, where only 7% of deposits are insured. This adds to the vulnerability of SVB and its depositors. In conclusion, this article examines SVB's balance sheet and interest rate risk exposure, identifies shortcomings in the management supervision system, and provides three reflections on the financial event.

Keywords: Liquidity Gap, Balance Sheet Risk, Interest Rate Risk, Duration Mismatch.

1. Introduction

Since 2022, the Federal Reserve has raised interest rates by 450 basis points eight times in a row to fight the highest inflation in 40 years, which has pushed the bond yield on the market to 5%-7%, resulting in a rapid decline in the price of US Treasuries and MBS, while US Treasuries account for 62% of Silicon Valley Bank AFS and MBS account for 75% of Silicon Valley Bank HTM. By the end of 2022, the combined floating loss of AFS and HTM of Silicon Valley Bank was US $17.7 billion, higher than the owner's equity of US $1.4 billion, resulting in a sudden increase in the pressure on assets and liabilities, and laying a huge hidden danger for thunderstorms [1].

To fill the liquidity gap caused by many withdrawals by scientific and technological enterprises, Silicon Valley Bank had to sell its asset portfolio, but because the interest rate was already high during the same period, the asset sale directly resulted in a large loss. Subsequently, Silicon Valley Bank launched a refinancing plan for the market, and the market worries intensified, leading to more deposit withdrawals and short-selling behaviors, and the liquidity crisis broke out. The reserve requirement was zero. In 2020, the Fed jumped the reserve requirement ratio for banks from 10 percent to zero, making it much less able to deal with risky runs [2].

From the perspective of SVB’s liabilities, the deposit structure is simple, and the demand deposit accounts for 66%. Since the epidemic in 2020, liquidity has been relatively loose, and Silicon Valley banks have absorbed many low-cost deposits from scientific and creative enterprises. In 2022, for

DOI: 10.54254/2754-1169/106/20241605

example, 66 percent will be demand deposits. In the past two years, the Federal Reserve has aggressively raised interest rates, and start-ups have fallen into financing difficulties, accelerating the consumption of deposits and leading to pressure on the debt side of Silicon Valley banks. From the asset side, the asset investment structure is simple, and the proportion of bonds purchased reaches 70%. To obtain higher returns, Silicon Valley Bank allocated a large number of long-term US Treasury bonds and residential mortgage securities (MBS), especially in 2022, the duration of the asset end is significantly longer than that of 2021, and 70% of the new assets are used to buy available-for-sale financial assets (AFS) and held-to-maturity investment (HTM), and only 24% are used to issue loans. Resulting in a maturity mismatch problem. As the interest rate rises, the value of bond assets is damaged, and the liquidity risk is gradually exposed and evolves into a huge loss. They have no choice but to sell bonds, which leads to a run on the market and eventually bankruptcy. From the perspective of the guarantee mechanism, the coverage rate of deposit insurance is too low. In the United States, the maximum deposit insurance coverage is 250,000 US dollars, and for ordinary banks, the coverage rate is only 50%. Silicon Valley banks' ratio is even lower: only 7%, or 93%, of deposits are uninsured. This article first analyzes the balance sheet of SVB and the interest rate risk exposure. Then, it uncovers the issue within the management supervision system. Finally, it provides three reflections on this financial event.

2. Balance sheet risk exposed by SVB events

2.1. The risk of rapid expansion of assets and liabilities in the short term

From 2019 to 2021, Silicon Valley banks experienced a process of rapid expansion of assets and liabilities in a short period of time (see Table 1). While liabilities were expanding, the banks chose an asset allocation model that seemed right but wrong, laying the root for the later bankruptcy.

From the perspective of liabilities, deposits increased substantially. In 2019, the deposits of Silicon Valley banks were only 61.758 billion US dollars, and the total investment accounted for 39.23%, which belongs to the normal level of the industry. In 2020, especially in 2021, deposits entered Silicon Valley Bank. The net increase of deposits in 2021 was 87.2 billion US dollars compared with 2020, more than three times that of 2019.

From the asset side, the loan growth was slow, and the investment increased significantly. Table 1 data shows that available-for-sale bonds (AFS) decreased from $30.913 billion to $27.221 billion, while hold-to-maturity bonds (HTM) soared to $98.195 billion, an increase of $81.6 billion. This means that almost all of Silicon Valley Bank's deposit increase in 2021 will be used to buy bonds held at maturity. Why should banks allocate their assets in this way?

Table 1: The consolidated balance sheet of Silicon Valley Bank.

The fiscal year is January-December. All values USD Millions.					
	2018	2019	2020	2021	2022
Total Cash & Due from Banks	2,245	4,392	14,448	7,887	9,116
Investments-Total	25,757	32,289	54,620	134,512	125,127
Treasury Securities(Hold to Maturity)	4,744	6,903	4,494	15,911	17,223
Mortgage Backed Securities (Available-for-Sale)	15,233	18,551	38,736	100,838	91,461
Net Loans	28,057	32,860	44,734	65,854	73,614
Other Assets (Including Intangibles)	219	484	507	1.178	1,420
Total Assets	57,035	71,217	115,511	212.001	211,793

DOI: 10.54254/2754-1169/106/20241605

Table 1: (continued).

Assets-Total Growth		24.87%	62.20%	83.53%	-0.10%
Return On Average Assets					0.79%

Source: Compiled according to Silicon Valley Bank's Annual Report 2018-2022.

How should banks allocate assets in a period of low-interest rates? In fact, it is very simple, that is, try to choose assets with long maturities. Loans take a lot of credit risk, while Treasury bonds and MBS are not only safe but also have good liquidity profitability, so they have become the best choice for many commercial banks, and Silicon Valley Bank is no exception.

2.2. Prefer to invest in securities rather than loans

Although Silicon Valley is the global center of science and innovation, there are also difficult loans and difficult loans, Silicon Valley Bank annual report data fully illustrate this point. In contrast, investment seems to be fast, low cost, low risk, and high return. This is an important reason for the high proportion of investments in Silicon Valley banks' assets. In 2019-2022, Silicon Valley Bank loans accounted for 46.71%, 39.11%, 31.34%, and 35.06%, while securities assets accounted for 39.23%, 43.58%, 60.51%, and 56.68%. Silicon Valley banks show a trend of not liking loans but keen on "investment" and "investment banking". Before 2017, this phenomenon widely existed in small and medium-sized commercial banks and rural commercial banks in China.

2.3. Long-term securities account for a high proportion of assets

According to the requirements of the accounting system, securities invested by banks can be divided into available-for-sale securities (AFS) and hold-to-maturity securities (HTM) according to the purpose of holding them. The former means that the bank will sell in the short term to make a difference, while the latter is held to maturity to receive principal and coupon payments. From the perspective of structure, the ratio of available-for-sale securities of Silicon Valley Bank in 2020-2022 is 63.04%, 21.27%, and 21.71%. This upheaval indicates a shift in Silicon Valley Bank's preference for holding maturing securities, which is most likely a forced move by the bank to increase its profitability by holding more maturing securities in a low-interest rate environment. First, the distribution of available-for-sale maturities. From Table 2, it can be found that Silicon Valley Bank's available-for-sale securities with a maturity of 1 to 5 years are $15.194 billion, accounting for about half of AFS [3].

Table 2: The maturity distribution of Silicon Valley Bank's available-for-sale securities (AFS) based on book value for 2021-2022.

December 31,2021					
			After one	After five	
		One year	Year to	Years to	After
(Dollars in millions)	Total	Or Less	Five Years	Ten Years	Ten Years
U.S. Treasury securities	$ 15,850	$ 247	$ 15,091	$ 512	$-
U.S. agency debentures	196	80	36	80	
Foreign govemment debt secunties	61	61			
Residential MBS					
Agency-issued MBS	8589				8,589

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Table 2: (continued).

Agency-issued CMO-fixed rate	982				982
Agency-issued CMBS	1,543		67	1,476	
Total	$ 27,221	$ 388	$ 15,194	$ 2,068	$ 9,571
December 31,2022					
			After one	After five	
		One year	Year to	Years to	After
(Dollars in millions)	Total	Or Less	Five Years	Ten Years	Ten Years
U.S. Treasury securities	$ 16,135	$ 983	$ 14,373	$ 779	$-
U.S. agency debentures	101	-	33	68	-
Foreign govemment debt securities	1,088	101	52	935	
Residential MBS:					
Agency-issued MBS	6,603	-	-	43	6,560
Agency-issued CMO-fixed rate	678	-	-	-	678
Agency-issued CMBS	1,464	-	326	1138	-
Total	$ 26,069	$ 1,084	$ 14,784	$ 2,963	$ 7,238

Source: Silicon Valley Bank Annual Report (Word edition), 2021 p. 129, 2022 p. 125.

Second, maturity distribution characteristics of hold-to-maturity securities. The following table shows the maturity distribution of securities held by Silicon Valley Bank (HTM). Compared with the available-for-sale securities in Table 2, it can be found that there are significant differences -- the proportion of long-term securities held in maturity securities is very high (see Table 3).

Table 3: Maturity distribution of Silicon Valley Bank's securities held to Maturity (HTM) based on book value for 2021-2022.

	December 31,2021									
	Total		One Year Or Less		After One Year to Five Years		After Five Years to Ten Years		After Ten Years	
(Dollars in millions)	Net carry Value	Fair Value	Net carry Value	Fair Value	Net carry Value	Fair Value		Fair Value	Net carry Value	Fair Value
U.S. agency debentures	$609	$615	$1	$1	$133	$135	$475	$479	$-	$-
Residential MBS:										
Agency-issued MBS	64,439	63,676	-	-	7	7	806	828	63,626	62,841
Agency-issuedCMO-fixed rate	10,226	10090	-	-	14	14	316	319	9,896	9,757
Agency-issued CMO-variable rate	100	101	-	-	-	-	-	-	100	101

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Table 3: (continued).

Agency-issued CMBS	14,959	14,721	-	-	211	209	971	982	13,777	13,530
Municipal bonds and notes	7,156	7,315	48	48	176	182	1,152	1,195	5,780	5,890
Corporate bonds	706	709	-	-	33	33	673	676	-	-
Total	$98,195	$97,227	$49	$49	$574	$580	$4,393	$4,479	$93,179	$92,119

	December 31,2022									
	Total		One Year Or Less		After One Year to Five Years		After Five Years to Ten Years		After Ten Years	
(Dollars in millions)	Net Carry Value	Fair Value	Net Carry Value	Fair Value	Net Carry Value	Fair Value	Net Carry Value	Fair Value	Net Carry Value	Fair Value
U.S. agency debentures	$ 486	$434	$ 1	$ 1	$ 118	$111	$367	$322	$ -	$ -
Residential MBS:										
Agency-issued MBS	57,705	48,356	-	-	25	25	1,066	994	56,614	47,338
Agency-issued CMO-fixed rate	10,461	8,576	-	-	90	86	129	120	10,242	8,370
Agency-issued CMO-variable rate	79	77	-	-	-	-	-	-	79	77
Agency-issued CMBS	14,471	11,977	39	38	153	141	966	810	13,313	10,988
Municipal bonds and notes	7,416	6,150	29	29	235	224	1,362	1,244	5,790	4,653
Corporate bonds	703	599	-	-	115	103	588	496	-	-
Total	$ 91,321	$76,169	$ 69	$ 68	$ 736	$ 689	$ 4,478	$3,986	$86,038	$71,426

Source: Silicon Valley Bank Annual Report (Word edition), 2021 p. 131, 2022 p. 127.

Taking 2022 as an example, the HTM held by Silicon Valley Bank has a book value of US $91.321 billion, of which securities with a maturity of more than 10 years are US $86.038 billion, accounting for 94.21%. However, bonds with a maturity of less than 1 year and 1-5 years are very few. This means that the average duration of Valley Bank HTM bonds is very long! This is the underlying problem that has led to the large paper losses on Silicon Valley Bank's bond assets.

2.4. Interest rate risk exposure

As we all know, the main reason for the bankruptcy of Silicon Valley Bank is the serious mismatch of the duration of its assets and liabilities, that is, many long-term assets of the bank are backed by relatively short-term liabilities. In fact, maturity mismatch is a normal part of the bank's asset liability management, commonly known as "short deposit and long loan", which is also the "open secret" of

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the bank to make money. But compared with other banks, Silicon Valley Bank has been aggressive in holding HTM for too long.

Table 4: Portfolios and maturity distributions of relevant bank bonds in 2022.

Silicon Valley Bank		Bank of America		Citibank	
AFS totaled $26.069 billion	HTM totaled $ 91.321 billion	AFS totaled $225.485 billion	HTM totaled $632.863 billion	AFS totaled $225.608 billion	HTM totaled $268.863 billion
Percentage of 10 years and older in AFS: 27.76%	Percentage of 10 years and above in HTM:94.21%	Percentage of 10 years and older in AFS: NA	Percentage of 10 years and above in HTM:80.53%	Percentage of 10 years and older in AFS:5.44%	Percentage of 10 years and above in HTM:44.24%

Source: Collated according to the 2022 annual reports of the relevant banks.

Banks can profit from holding bond assets in two ways. One is to get regular interest payments and principal repayments from the issuer, and the other is to get the bid-ask spread from selling the bonds, which can be either positive or negative! Why do longer-dated bonds lose more when interest rates rise? According to price-fixing theory, the spread a bank gets to sell a bond it bought depends mainly on two factors: market interest rates and changes in them and the bond's own duration (the weighted average time it takes to recoup its investment). Where denotes the spread, represents the rate hike, and represents the duration of the bond[3].

$$\Delta P = \frac{\Delta r}{1+r} * D * p \quad (1)$$

Obviously, for all banks, the same rate hike is common, but because different banks have different durations of their bond portfolios, their bonds will suffer different losses. The formula above shows that the longer the duration of a bond portfolio, the greater the loss when a rate rise occurs (and the reverse is true when a rate cut occurs). Annual figures show that the durations of Silicon Valley's bonds are much longer than those held by Citibank (see Table 4). That is an important reason why Silicon Valley went bust and Citibank, though it did suffer losses, did not.

Although all banks' bond holdings lose value when interest rates rise, the amount of losses they suffer varies greatly depending on the amount and duration of their bond portfolios. In 2022, among the three banks listed (see Table 5), Silicon Valley Bank's AFS float loss rate is 8.86%, HTM float loss rate is 16.6%; Bank of America AFS float loss rate is 2.12%, HTM float loss rate of 17.16%; And Citibank AFS float loss ratio of 2.32%, HTM float loss ratio of 9.38%. Floating loss refers to the book loss, once forced to sell (such as Silicon Valley Bank, in response to the deposit run, was forced to sell "available-for-sale securities" to raise liquidity), will become a real loss and be recorded in the income statement. The current book floating loss of assets may also become profitable assets in the future, of course, provided that the "future" is obtained. Floating loss ratio = floating loss amount/balance of various securities.

Table 5: Unrealized Losses of the relevant banks for 2021-2022.

		Units: hundreds of millions of dollars	
bank	Purpose of holding	2021	2022
Silicon Valley Bank	AFS	3.13	25.33

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Table 5: (continued).

assets $211.793 billion	HTM	13.43	151.60
Bank of America assets $3,051.375 billion	AFS	6.83	47.87
	HTM	129.57	1085.96
Citibank assets $2416.676 billion	AFS	8.41	59.61
	HTM	26.39	253.16

Source: Compiled according to the annual reports of the relevant banks in 2022.

Although the amount of floating losses of Bank of America is much larger than that of Silicon Valley Bank, its capital strength, asset size, reputation and liquidity management ability are far superior to Silicon Valley Bank, so there is no run and liquidity risk caused by a large number of floating losses. In 2022, the owner's equity of Bank of America will be $273.197 billion, and the asset size will be $3,051.375 billion, while that of Silicon Valley Bank will be $16.04 billion and $211.793 billion, respectively.

3. The Analysis of Risk Management

3.1. The management fails to grasp the future trend correctly

2020 is a pivotal year for Silicon Valley banks to "go from victory to failure." Compared with 2019, the liabilities and assets of Silicon Valley Bank have increased greatly in 2020, which may be attributed to the hard work of the management and employees of the whole bank. And the big increase in 2020 is only a prelude to an even bigger rise in 2021 (see chart 1). Looking at the annual report for 2020-2022, there is no explanation for this big increase in management discussions, especially the long-term asset allocation strategy. Even in the 2022 annual report, there is not much mention of potential problems in managing its assets and liabilities, such as the impact of interest rate hikes on the fair value of the bank's long-term HTM [4].

In the 2021 annual report, management noted that 2021 was an extraordinary year as we achieved a record EPS of $31.25, a net income of $1.8 billion, and a return on equity of 17%. Balance sheet growth offset pressure from the low-interest rate environment, which drove net interest income up 47 percent over 2020. SVB would continue to improve our banking rating classifications and aim to move from a Category 4 banking organization to a Category 3 banking organization. To support continued balance sheet growth, we have made several capital market forays in 2021. During the year, we issued $3.4 billion of preferred stock, $2.4 billion of common stock (excluding the $1.1 billion of stock issued to complete the Boston Private Acquisition), and $1.7 billion of long-term debt. These offerings, combined with our strong earnings for the year, allow us to support our capital adequacy ratio further and maintain our growth momentum and ability to make long-term investments in the near term.

From these statements, it can be found that SVB management is satisfied with the bank's performance and full of confidence for further progress in the future, while the bank's massive increase in liabilities, asset allocation, and the sustainability of earnings and other issues are basically not carefully analyzed and paid attention to. Such "confidence" also runs through the 2022 annual report.

In the 2022 Annual Report, management indicated a challenging year as prolonged market volatility slowed public and private financing activity, which put pressure. SVB securities revenue continued to deliver solid results, underpinned by our past investments. Credit quality overall

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remained healthy in 2022. While NPLS and bad debt write-offs did increase at the end of the year due to current market challenges, they remained at relatively low levels.

It is clear that the above analysis deliberately sidesteps the issue of the impact of interest rate hikes on the value of the bank's large portfolio assets and potential losses and focuses more on the quality of the bank's loans and the performance of its securities subsidiaries.

In addition, regarding the issue of liquidity risk, in the management discussion of the 2021 Annual Report, the management believes that "liquidity is critical to our business, both in the SVB Group and at the bank level." We need sufficient liquidity to meet our expected financial obligations, as well as unexpected requirements arising from changes in customer activity and markets, such as unexpected cash outflows that occurred when certain customers increased the use of their credit lines at the start of the COVID-19 pandemic. The main sources of liquidity for the SVB Group include investments and interest from subsidiaries operating outside the bank and dividends from banks, among others. Our main sources of liquidity are customer deposits, wholesale short-term and long-term borrowings secured by our high-quality securities, long-term capital market bond issuance, and unsecured overnight borrowing in the Federal funds market." Management remains confident in the Bank's ability to deal with liquidity issues [5].

3.2. Management attaches importance to credit risk and neglects market risk management

The 2021 and 2022 annual reports, as well as the management discussion, have made a relatively comprehensive analysis of the credit risk faced by the bank, which is also the focus and practice of the bank's annual report information disclosure. However, Silicon Valley Bank's analysis of the interest rate risk it faces continues to follow the traditional routine, such as sensitivity analysis of net interest income, provision for impairment, etc., and there is not too much discussion on the impact of inflation and interest rate hike on the bank's asset portfolio, especially bond investment assets.

Regarding the default risk of debt assets, the 2022 annual report noted that "our HTM securities' credit loss provisions decreased by $1.0 million, primarily due to the continued stability of our securities portfolio during the year. As of year-end, our HTM portfolio consisted entirely of bonds rated A3 or higher, all considered investment grade. A provision of $7 million was made for HTM Securities in 2021, primarily stemming from the $712 million corporate bond portfolio. As of Dec 31, 2021, our HTM portfolio consisted entirely of A3 or higher rated bonds, all of which are considered investment grade. The provision made for HTM Securities in 2020 was less than $1 million, which was primarily determined by the forecasting model of the economic environment at the time. As of December 31, 2020, our HTM portfolio consisted entirely of Aa2 or higher rated bonds, all considered high-quality bonds." These statements speak volumes about the fact that SVB management is primarily concerned about the risk of default in the securities it invests in [6].

As for possible future interest rate changes, management is already aware of them. In a management discussion for the 2021 annual report, it noted that "while the Federal Reserve is expected to raise the target federal funds rate in 2022 in response to recent inflation trends, if rates do not rise, or if the Federal Reserve reduces the target federal funds rate below 0%, these low rates could continue to constrain our spreads, And could have an adverse effect on our business forecasts. On the other hand, an increase in interest rates to combat inflation or otherwise could result in a change in the mix of non-interest-paying and interest-paying accounts, as well as in the level of off-balance sheet investment business, which could also affect our spreads [7]. We cannot predict changes in interest rates, which are affected by factors beyond our control, including inflation, deflation, economic recessions, unemployment, money supply, and other changes in financial markets." From this, it can be found that, in fact, the management has already anticipated the possibility of raising interest rates in 2022, but from the emotional point of view, it seems that it is more willing to believe that in 2022, "the Federal Reserve will reduce the target federal funds rate to

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below 0%". Therefore, in 2021 and early 2022, Silicon Valley Bank did not make substantive adjustments to the excessively long duration of the bank's bond portfolio and missed the opportunity! In the 2022 annual report, Silicon Valley Bank routinely analyzed the impact of interest rate hikes on net interest income and conducted stress tests under the scenarios of interest rate hikes or rate cuts of 100BP and 200BP (see Table 6).

Table 6: Sensitivity analysis of net interest income of Silicon Valley Bank[3]Unit: %

December 31,2022	Estimated Percent Increase /(Decrease)in NII
+200	3.5
+100	1.8
-100	(1.8)
-200	(5.8)
December 31,2021	Estimated Percent Increase/(Decrease)in NII
+200	22.9
+100	10.9
-100	(6.4)
-200	(8.6)

Source: Silicon Valley Bank Annual Report (Word edition), 2022, p. 90.

3.3. Silicon Valley Bank's sensitivity analysis of net interest income

In fact, the above sensitivity analysis only looks at the impact of changes in interest rates on net interest income of deposits and loans and does not include securities assets, which are larger than loans and number more than $100 billion, that are affected by higher interest rates. Therefore, the limitations of the sensitivity analysis of bank net interest income are very obvious.

3.4. The management does not actively manage the interest rate risk

Silicon Valley Bank does not adjust the duration of its bond assets to reduce losses after it enters a rate hike cycle. From the data in Table 3, it can be seen that in 2021, the HTM bonds of Silicon Valley Bank with ultra-long maturity were 93.179 billion US dollars, while in 2022, they were still as high as 86,038 billion US dollars, only 7.141 billion US dollars less, a decrease of 7.66%. Why didn't the bank significantly reduce the ultra-long HTM bonds in the early stage of the interest rate hike in 2022, to reduce the duration of the bond portfolio and thus reduce the value loss of the bonds? This may reflect the management's misjudgment of the Fed's interest rate hike policy, as well as the bet that the Fed's interest rate hike will not be as long and sharp. In fact, by the end of 2022, it will be impossible for SVB to reduce its losses on its bond portfolio by adjusting the duration![8].

Notably, SVB management also reclassified $8.8 billion of securities originally classified as "available-for-sale securities" to "hold-to-maturity securities" in 2021. The purpose of this reclassification is simple, as the reclassification allows the floating loss of the US $8.8 billion bonds, i.e. changes in the value of these securities, not to be reported in the financial statements, which is also allowed by the accounting system. But $8.8 billion is minuscule relative to the more than $100 billion in outstanding bonds. As a result, efforts to make the financial statements look better have not had much effect.

Silicon Valley banks did little to manage interest rate risk by trading interest rate derivatives. Banks always face interest rate risk on their deposits, loans, and investments! As we all know, the main role of interest rate derivatives is to manage the bank's or client's interest rate risk, such as interest rate swaps, forwards, interest rate futures and options.

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According to the annual report of Citibank, in 2021, the transaction volume of interest rate derivatives for hedging purposes was 267.035 billion U.S. dollars (equivalent to 1/10 of the total assets), while the transaction volume of interest rate derivatives for trading purposes was 277.067 billion U.S. dollars (equivalent to more than 10 times of the total assets [9]. In 2022, the trading volume of interest rate derivatives for hedging purposes was $255.288 billion (equivalent to 1/10 of the total assets), while the trading volume of interest rate derivatives for trading purposes was $30,565.052 billion (equivalent to more than 10 times of the total assets). Is there no interest rate risk in Silicon Valley Bank when the amount of interest rate derivatives traded in 2021 and 2022 is almost negligible compared to Citibank and others? Or does management not know that interest rate derivatives can manage interest rate risk?

3.5. Management supervision is relaxed

The U.S. financial regulatory system and laws are extremely complex. As a bank holding company with financial holding company (FHC) status, SVB Group is subject to primary regulation, supervision and examination by the Federal Reserve under the Bank Holding Company Act of 1956, as amended. As a California-chartered bank and a member of the Federal Reserve System, the bank is subject to supervision and examination by the Federal Reserve and the California Department of Financial Protection and Innovation (DFPI) [10].

To improve the regulation of large bank holding companies, in October 2019, the Federal Bank tailored prudential regulatory standards for large bank holding companies and applied capital and liquidity rules to large bank holding companies and depository institutions to amend the Dodd-Frank Wall Street Reform and Consumer Protection Act. This is the Economic Growth, Regulatory Relief, and Consumer Protection Act (EGRRCPA). Under the EGRRCPA, the threshold for the Fed to impose enhanced prudential standards on bank holding companies was increased from an average of $50 billion in total combined assets to $250 billion.

Under The Tailoring Rules, the US classifies banks with total assets of $10bn or more into four distinct categories based on their global systemically important bank holding company (G-SIB) status, size, and four other risk-based measures. The first category, the US G-SIB, applies the strictest criteria. The least stringent criteria apply to the fourth category of organizations, which have an average combined total asset of between $100 billion and $250 billion. An SVB group is considered a Category 4 organization and is subject to the requirements applicable to a Category 4 organization.

The Financial Supervisory Authority (FSA) has regulatory requirements for commercial banks regarding risk management, comprehensive capital analysis, stress testing, resolution of significant financial distress or failure, and liquidity [11]. In particular, in terms of liquidity regulation, Category 4 institutions with more than $50 billion and Category 1 to 3 institutions are required to comply with the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSFR), and are required to maintain high-quality liquid assets in accordance with specific quantitative requirements. However, the Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR) requirements are reduced for Category IV institutions and for Category III institutions with Weighted Short-Term Wholesale Funding (WSTWF) below $75 billion. As a result, Silicon Valley Bank is currently exempt from the LCR and NSFR requirements. Additionally, with respect to the single counterparty credit line, in June 2018, the Federal Reserve issued a final Single Counterparty Credit Line (SCCL) rule for large banking organizations (excluding Category 4 institutions), which provides that a large institution's aggregate net credit exposure to any other unaffiliated counterparty may not exceed 25 percent of Tier 1 capital. Given that SVB Financial Corporation is a Category 4 institution, it is not subject to the SCCL requirement. Purchased bonds and MBS have a risk-weighting factor of zero and, due to the characteristics of a bank, the accounting treatment of unrealized gains and losses for AFS is not recorded in the regulations.

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4. The Reflection

4.1. The asset structure of Silicon Valley banks is aggressive

The proportion of securities investment is very high, reaching 56.68% in 2022 and 60.51% in 2021 when it is the highest.

4.2. The securities portfolio of Silicon Valley Bank is very aggressive

They have short-term gains at the expense of long-term interests.(1) AFS accounts for a relatively low proportion (21.71%), HTM accounts for a high proportion (76.07%), Bank of America accounts for 26%, while Citibank accounts for almost half (AFS: HTM=2556.08:2688.63). (2) In the maturity distribution of securities held to maturity (HTM), the proportion of bonds with more than 10 years in 2022 is as high as 94.21%, and that of 2021 is 94.48%, and the proportion of bonds with more than 10 years in 2022 is also as high as 80.53%. In comparison, Citibank's bonds of 10 years or more in 2022 account for only 43.48%.

4.3. The risk management of Silicon Valley banks is very aggressive

Silicon Valley Bank's nominal transaction volume of interest rate derivatives for hedge purposes in 2022 is only 550 million US dollars, with almost no use of interest rate derivatives transactions to manage the interest rate risk of its balance sheet, while Citibank's nominal transaction volume of interest rate derivatives for hedge purposes in the same period is 255.288 billion US dollars. While the notional turnover of tradable interest rate derivatives was as high as $30,565,0552 billion [12].The bankruptcy of Silicon Valley Bank once again confirmed that commercial banks could only "achieve success" by "acting steadily." Stability is the eternal creed of banking management, and radicalism will eventually have to pay the price.

5. Conclusion

First, it is necessary to rationally allocate the maturity of assets and liabilities, comprehensively consider various risk factors to allocate the maturity of assets and liabilities, especially pay attention to the maturity structure of deposits, be alert to the occurrence of abnormal situations such as the rapid decline of deposits, and ensure that the maturity and liquidity of assets and liabilities match. Second, we should strengthen the management of interest rate risk. When the interest rate market fluctuates greatly, we should use interest rate derivatives and other interest rate risk management tools to hedge interest rate risk in a timely manner. Increase the use of FTP tools, pricing asset, and liability products, and improve the efficiency of capital use; Make full use of LPR market quotation interest rate to make reasonable pricing of loan products to avoid risks caused by too high or too low-interest rates. Third, improve the management system, use liquidity risk management tools, and strengthen liquidity risk management; Comprehensively and systematically control liquidity risks through identification, measurement, and monitoring; manage capital positions well, formulate position plans, and maintain reasonable and sufficient liquidity.

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