Case Study #2: The Rise and Fall of Silicon Valley Bank

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"That's how capitalism works."
-President Biden in wake of SVB failure

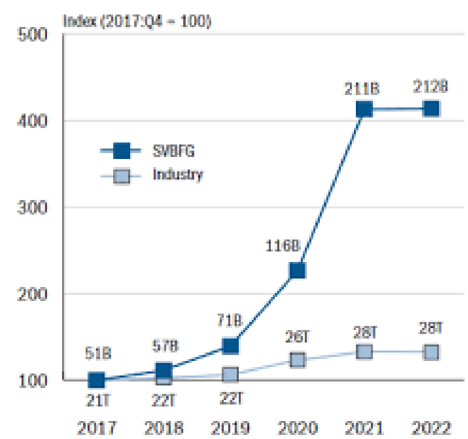
Founded in 1983, Silicon Valley Bank (SVB) experienced exponential growth to become a central provider of financial services to the tech industry. It collapsed suddenly in March 2023, taken into receivership by the Federal Deposit Insurance Corporation. The purpose of this study is to understand what factors led to the failure, how it might have been avoided, and what lessons we should take for regulation, supervision, and other policies such as emergency liquidity from the Fed and deposit insurance.

1. The star bank of the US tech startups and VCs

When SVB failed, it had $221 billion in assets, making it the 16th largest bank in the US and falling just under the $250 billion threshold needed to qualify for enhanced regulation and supervision under the Dodd Frank Act.[1] SVB had come a long way from when it was founded in 1983 as a state-chartered bank by Bill Biggerstaff (Wells Fargo executive) and Robert Medearis (Stanford University professor). Their vision was to provide financial services tailored to the needs of startup companies in the tech industry, a niche market that was unserved (and may still be).

SVB did a lot of things right over the next 40 years to become a core financial service provider to startups and Venture Capitalists (VCs) in the US and globally. It deliberately focused on its niche, developing services that were tailored to meeting the needs of startup companies, such as cash management, making loans that considered the long timelines for startups to earn revenue, and connecting young firms with VCs (Gomepers 2023)

Figure 1: SVB asset growth leaves industry in the dust



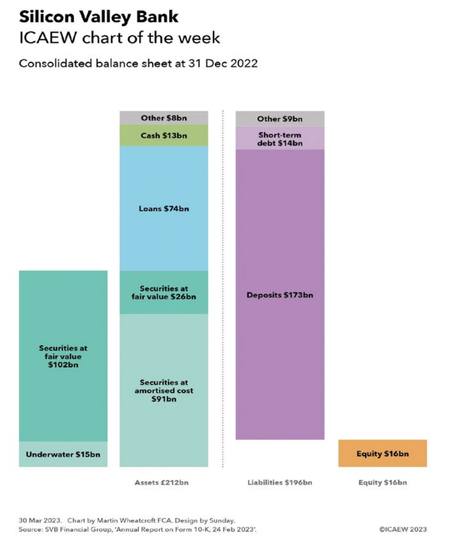
Source: BCSB (2023)

While SVB had been growing steadily over the years, with a combination of organic growth, new customer bases, and acquisitions, its assets tripled between 2019 and 2022 (Figure 1). This was the result of rapidly growing deposits at SVB as the VC industry expanded in a low interest rate environment and the COVID-era boosted the tech industry (BCBS 2023).

[1] In 2018, the Dodd Frank Act was revised to increase the threshold from $50 billion to $250 billion and give the Federal Reserve discretion to apply discretionary enhanced requirements for banks with assets between $100 billion and $250 billion.

By the end of 2022, SVB's assets were mostly made up of securities that were classified as "held to maturity" (HTM), and therefore reported at amortized cost (43%), and loans (35%). Only 12% of SVB's assets were earmarked as "available for sale" (AFS) and therefore reported at fair value. Required reporting to the Securities and Exchange Commission had enough information to see that SVB had $15 billion of unrealized losses against only $16 billion in equity (Figure 2).[2] It was also possible to see that 88% of SVB's liabilities were deposits, which would have been at risk of a run. Though investors may not have known the exact share of deposits that were uninsured (95%), they certainly could have guessed that it was high given SVB's business specialty.[3]

Figure 2: Annual report form 10-k shows both concentrated liabilities and unrealized losses



Nonetheless, Forbes gave SVB 20th place in their annual list of "America's Best Banks" in February 2023 (Forbes 2023a).[4] Clearly, Forbes and many others were focused on the effect of rising interest rates on net interest margin and profitability. As seen in the lead up to the global final crisis, SVB was still receiving "high marks" from the ratings agencies when it failed. For instance, Moody's had downgraded some of its ratings on SVB on March 8, but not below investment grade, and it affirmed its strong assessment of the bank's short-term deposits (Wall Street Journal 2023).

2. Precipitous fall from grace

Just days after Moody's came out with this affirmation, the CEO of SVB disclosed that it had sold $21 billion in securities (those that were on the book at fair value) at a loss of $1.8 billion. SVB also announced that they were seeking to raise $2.25 billion in capital, which put the focus of depositors and investors on the unrealized losses that SVB had on the banking book that would wipe out all their remaining capital should they need to sell any of the HTM assets. Given this risk and SVB's reliance on uninsured deposits, it lost 85% of its deposits in two days (BCBS 2023). By Friday, 10 March 2023, SVB was closed by the California Department of Financial Protection and Innovation (DFPI) and placed under receivership of the Federal Deposit Insurance Corporation (FDIC).

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[2] These unrealized losses come from the fact that HTM assets are reported at amortized cost and therefore do not reflect any change in market value at the time of reporting (unlike AFS assets, which are recorded at fair value). For more on these accounting rules see Peters (2023).

[3] The FDIC insures deposits up to a maximum of $250,000 in eligible financial institutions.

[4] This ranking was based growth, credit quality and profitability in the 12 months through September 30, 2022 of the 100 largest US banks. Disclosures at that time would also have shown the mark-to-market and deposit concentration vulnerabilities.

How could plain vanilla securities cause so much trouble?

It's easy to think, especially after the Great Financial Crisis, that a bank couldn't go wrong with the simplicity and high credit quality of a portfolio concentrated in US treasuries and other securities with an explicit or implicit US government guarantee (e.g., Fannie May US MBS). After all, these are the "risk free" assets that form the benchmark yield curve from which every other asset is priced.

Box 1: **What is interest rate risk on the banking book?**

Interest rate risk on the banking book (IRRBB) is the risk to the bank's earnings or capital that can affect the bank in an adverse manner. For instance, interest rate reductions can result in lower net interest rate margins because returns on assets decline while expenses like interest paid on deposits may not decline as much, particularly as interest rates are close to zero. Interest rate increases can change the value of assets, such as fixed-income securities, which affects the amount of equity (BCBS 2019). The degree to which losses are transparent to investors, depends in part on how the assets are classified – held to maturity (HTM) assets are reported at amortized cost and available for sale (AFS) assets are reported at fair (or market) value. Unrealized losses are reported, but they don't affect earnings or the regulator's calculation of capital in the US for mid-sized banks like SVB. That means unrealized losses on a bank's balance sheet can go largely unnoticed by its risk team and other analysts until there is a problem such as the need to sell some of the assets.

This classification makes a big difference to how the reported equity position of a bank changes if asset sales are required to fund deposit withdrawals. Consider a hypothetical bank with $1B assets, all in government securities, of which $900 million are HTM and the rest are AFS (panel 1). Given their liabilities (senior debt and deposits) amount to $900 million, their reported equity is $100 million. If depositors decide to withdraw $95 million and the bank funds this by selling AFS assets at a 5% loss, equity falls to $95 million still around 10% of assets (panel 2). If depositors want to withdraw another $95 million, the bank will need to sell HTM assets. If the loss is 5%, some equity remains (panel), but a 10% loss wipes equity out almost completely. A higher equity (capital) buffer to start with would help to avoid the panic about solvency that feeds depositor runs.

1. Balance Sheet with both hold to maturity and available for sale securities

(millions of dollars)

Assets	Liabilities
900 securities (hold to maturity, valued at amortized cost) 100 securities (variable for sales, valued at fair value)	100 senior debt 800 deposits 100 equity (10% of assets)

2. What happens if need to sell available for sale assets at 5% loss to fund $95 million outflow of deposits?

Assets	Liabilities
900 securities (hold to maturity, valued at amortized cost)	100 senior debt 705 deposits 95 equity (10.5% of assets)

3. What if there's a further $95 million outflow of deposits and need to sell hold to maturity assets at 5% loss?

Assets	Liabilities
760 securities (now all must be marked at fair value)	100 senior debt 610 deposits 50 equity (6.5% of assets)

4. What if the loss on sale of hold to maturity assets is 10%?

Assets	Liabilities
715 (now all must be marked ooat fair value)	100 senior debt 610 deposits 5 equity (0.0007% of assets)

The trouble is that, even though they don't carry a meaningful default risk, they do carry interest rate risk; that's because they are often longer duration assets that pay a fixed rate of interest over their term. A bond's market value will therefore be sensitive to any change in interest rates relative to the rate of interest at the time of the asset's purchase. For instance, if a bank purchased a bond with no coupon for $951 that paid out $1,000 in 5 years, the yield on that bond is 1%. If interest rates were to rise from 1% to 5%, then the price of this bond would fall by around 17½%.

This type of interest rate risk on the banking book (IRRBB) materialized for SVB as the Federal Reserved pursued an aggressive monetary policy strategy to lower inflation, raising interest rates by 500 basis points between March 2022 and July 2023. As discussed above, this was not transparent to investors since a large proportion of the securities were reported at amortized cost, giving a distorted view of SVB's equity position (unless you read the fine print). SVB fell off a financial cliff once it was clear that they would have to sell some of these assets and then realize the loss on its entire HTM book.[5] Box 1 walks through a stylized example of how capital adjusts more if HTM assets are sold at a loss to fund deposit withdrawals than if, instead, AFS sold are sold at the same loss.

3. Public sector rides to the rescue (again)

The situation with SVB was troublesome from a financial stability point of view, not so much because of its size and complexity, but rather due to the contagion risk that its failure presented to other banks. Just two days after SVB failed, Signature bank was placed under receivership of the FDIC. The contagion was at serious risk of spreading further as investors became aware that many other US banks were facing serious unrealized losses as well. While the FDIC Chairman said that the market value of US banks' long-term assets had declined $620 billion in 2022, other analyses put the number just over $2 trillion with many regional banks in worse shape than SVB (Gilson 2023). Given many of these regional banks also had a high reliance on uninsured deposits, albeit less than SBV, the risk of further runs was palpable.

Given this, the Treasury, Federal Reserve, and the FDIC issued a joint press release that announced a number of measures in order to "ensure that the U.S. banking system continues to perform its vital roles of protecting deposits and providing access to credit to households and businesses in a manner that promotes strong and sustainable economic growth" (Yellen et al. 2023). These included:

1. ***An extension of deposit insurance*** to all depositors of SVB and Signature Bank, such that access to all funds was guaranteed for the Monday morning. They clarified that shareholders and certain unsecured debtholders would not be protected, that senior management had been removed, and that no losses would be borne by the taxpayer. This latter commitment was backed by the fact that any losses to the Deposit Insurance Fund to support uninsured

[5] Under accounting rules, even if only a portion of an HTM portfolio is sold, the whole portfolio is converted to AFS and marked to market.

depositors would be recovered by a special assessment on banks, as required by law. These actions required a systemic risk exception (SRE).[6]

2. ***Enhanced emergency liquidity*** – the Federal Reserve created the Bank Term Funding Program (BTFP) and eased conditions at discount window to make sure banks would have the ability to meet the needs of all their depositors. The BTFP offered loans up to one year to a wide range of financial institutions (e.g., banks, savings associations, credit unions, etc). Eligible collateral included US treasuries, MBS, and agency debt, which was not unusual. The novel feature was that the collateral would be valued at par; this was necessary given that the issue was unrealized losses on these types of securities, but it meant that the Fed was taking on credit risk because the loan was not fully collateralized. Because of this risk, the facility was backstopped by Treasury funds from the Exchange Stabilization Fund ($25 billion).

Was this a bailout? Yes…

The day after all this was announced, President Biden was keen to make it clear to Americans that "no losses will be borne by taxpayers." The arguments presented rest heavily on the fact that any FDIC losses would be borne by surviving banks (special assessments), and that equity and debt holders were not bailed out. In the end, the cost to the FDIC's insurance fund to be paid through special assessments amounted to around $22.5 billion, of which $3 billion covered insured deposits and the remaining balance covered uninsured deposits at both SVB and Signature bank.[7]

Despite this, there are clear elements of a bail out in that financial institutions that had insufficient capital and liquidity benefited from a "too big to fail" subsidy. The deposit insurance limit was effectively removed for two banks, creating moral hazard. Fed lending was not fully collateralized and was tailored to banks that had not properly managed their IRRBB and liquidity. Further, the special assessment was charged to surviving banks that are not only taxpayers, but that will likely pass along some or all of the cost to their customers.

In the spirt of never wasting a good crisis, there are several avenues to pursue to reduce the chance of bailouts in the future:

i. *Strengthen governance* - SVB's board and senior leadership failed to manage basic risks.
ii. *Reduce reliance on unstable sources of funding* – over reliance on deposits that were uninsured and concentrated in certain industries (fintech, including crypto) increased the chances of a run.
iii. *Better capitalize risks* – unhedged interest rate risk and unrealized losses were not reflected in capital. Clearly more capital to deal with this risk would have served SVB

[6] An SRE is a recognition by Congress that financial stability concerns sometimes are more important than seeking to minimize the potential costs to taxpayers. The FDIC needed this exception to extend deposit insurance to all SVB and Signature bank depositors. For more on this see Congressional Research Service (2023).

[7] The FDIC created Silicon Valley Bridge Bank, National Association that was a full-service bank operated by the FDIC until it was acquired by First Citizens Bank on 27 March 2023. It also created a bridge bank for Signature bank and has been selling off the assets.

well, as fear that capital was insufficient fed a viscous cycle with further incentive for depositors to run. The SVB regulators neither tested for this kind of risk nor required any kind of capital to absorb losses should this risk materialize. Other jurisdictions, such as the UK and Europe, do impose capital requirements to cover IRRBB (Woods 2023).

iv. *Give supervisors more teeth:* insufficient understanding and attention given size, MRAs and MRIAs are too slow.

v. *Recognize that TBTF is still a problem:* this could start with lowering the threshold for systemically important banks so that mid-sized banks like SVB have adequate regulation and supervision. Also need better resolution tools, including central bank liquidity facilities that avoid moral hazard while providing an automatic stabilizing force to the system (G30 2024).

3. Questions for Discussion

a) *What could the SVB Board of Directors and management have done to avoid the collapse? What might be the similarities between SVB and CS in terms of governance failures?*

b) *Why do you think that authorities were so slow in responding to known risks to SVB? What are the most important gaps in regulation and supervisory powers that should be closed, if any?*

c) *Despite President Biden promising that no taxpayer money would be used, was this yet another "bail out" of a failed bank? If so, why and what might be done about it for next time?*

d) *What lessons can be learned about the role of the Fed in providing emergency liquidity?*

e) *Should deposit insurance be increased and, if so, what would be the new parameters and why?*

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