

Failure of SVB Oversight: Reacting to Incurred Losses Versus Risks Taken

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Abstract

Many of the papers and studies on Silicon Valley Bank (SVB) have emphasized the managerial and supervisory problems in the year leading up to its failure, particularly highlighting the lack of action in the final year of the bank's existence. This study highlights that the risk management problems were long-standing and points to more endemic problem with how bank supervision is conducted in the United States, which encourages aggressive action once risks are manifested in losses, rather than when the risks are first taken on.

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In March of 2023, Silicon Valley Bank (SVB) failed. At the time it had \$208 billion in assets and was the 16th largest bank in the United States. Shortly after SVB's failure, First Republic Bank and Signature Bank, both among the thirty largest banks in the United States at that time, experienced runs and were also closed. Regional bank stocks declined significantly, lending conditions tightened, and concerns were raised about a possible recession. In response, The Federal Reserve and US Treasury announced systemic exemptions providing full depositor protection at the failed banks and introduced a new lending facility allowing banks to pledge Treasury securities at par rather than market value. This paper examines the role that bank supervision and regulation played in the SVB failure, and whether appropriate prudential policies could have avoided the failure of SVB and the subsequent need for extraordinary actions by federal authorities to contain the broader fallout stemming from SVB's failure.

There have been several previous studies of the SVB failure. US government investigations of the failure included a Federal Reserve report, the Barr report, which argued supervisors did not ensure problems were fixed quickly enough and highlighted an earlier reduction of prudential oversight. The first GAO report on SVB (released on March 6, 2024) focused on the need for more timely

escalation of supervisory actions. The second GAO report focused on the 6 months preceding the failures of SVB and Signature, and the supervisory actions taken during that period. Among the academic studies, there is a focus on the risk taking by SVB (Parker, 2023; Metrick, 2024), the interaction of monetary tightening and self-fulfilling runs (Jiang, 2024) and duration risk and disclosure (Lucas and Golding, 2024), while leaving aside the underlying composition of SVB's deposits and securities portfolio.

In contrast, in this paper we take a much longer historical view of the positions and risks taken by SVB. We find that SVB adopted risky positions over the previous 13 years, with a significant mismatch in the duration of assets and liabilities, and an over-reliance on long-duration, government-backed mortgages that were financed by potentially runnable demand deposits that were largely uninsured. This extreme mismatch in duration and reliance on uninsured business deposits was highly profitable in a macroeconomic environment where interest rates were low and relatively stable, as prevailed after the Great Financial Crisis and during the pandemic. Indeed, SVB grew much more rapidly and was more profitable than most other banks. This alone should have raised questions about the drivers of their success. However, the SVB balance sheet was positioned to incur large losses in any macroeconomic environment with sharply rising rates. While the primary onus on reducing risk was on bank management, supervision

and regulation should have intervened when the risk positions were being taken. The focus on supervision that only takes significant action when losses are incurred rather than when risks are being taken, indicates an inherent problem with the US supervisory process. This was exacerbated by regulatory changes that reduced supervisory oversight of large regional banks, and accounting practices that did not fully reflect embedded losses from securities in the held to maturity account (There are other reasons for why regulatory capital and accounting capital can have delayed loss recognition, see Begenau et al. (2026)). We also highlight that many standard bank failure models and risk measures are similarly biased towards realized losses rather than risks taken.

SVB's transition to a regional bank

We focus on SVB from the time it crossed the \$10 billion size threshold until the time of failure, a period of 15 years. We focus on the \$10 billion threshold because it is the point at which the Federal Reserve's supervisory approach shifts from treating the bank as a community bank, which tend to have fewer regulatory and supervisory constraints, to treating it as a regional bank. Community banks receive only periodic exams and generally have simpler holding company structures, thus receiving relatively little supervisory oversight.

Once a bank holding company exceeded \$10 billion, it was placed in the Federal Reserve's regional bank portfolio. This normally included more senior bank examiners and the portfolio of regional banks was used as the peer group to evaluate how the bank performed relative to other banks. Expectations on enterprise risk management were typically higher, as regional banks tended to have more complicated business lines as well as the need for strong internal audit to self-identify emerging problems in the bank.

Table 1 provides some balance sheet items when SVB first crossed the \$10 billion asset size in 2008 and 2009, as well as 5 years later in 2012. Because end of year balance sheet items in 2008 were likely distorted by the financial crisis, we focus first on the 2009 balance sheet items. It is clear that SVB already looked quite different than many small regional banks. With total assets in 2009 of \$12.8 billion, SVB had \$6.3 billion in demand deposits which were non-interest bearing and largely uninsured. Because these are usually business accounts that often have both deposit and lending relationships with the bank, businesses agree to keep deposits in a non-interest account but in return generally get better commercial terms on their loans. These deposits tend to be largely uninsured, since they usually exceed the deposit insurance limit. While these are highly desirable accounts for banks because of their low cost, it is unusual for a relatively small bank to have such a large concentration of business deposits. That is particularly

true because they had only \$4.5 billion in total loans, with a total loan-to-total deposits ratio of 43 percent. As a result, SVB had large holdings of MBS and agency securities, with total securities of \$4.5 billion.

How did a bank with such a small loan book get such large business deposits? Loan concentration by industry shows that the loans were highly concentrated in technology and private equity. SVB specialized in providing services to start-up firms. Many of these firms have significant cash reserves since they initially receive financing from private equity or private investors and then slowly draw down these funds until they get additional equity tranches or get large enough to go public.

Having a highly concentrated bet on start-up companies that held large deposits at SVB posed two significant risks. First, having large uninsured deposits that were critical financing for start-ups made the bank highly susceptible to runs should the depositors lose confidence in the solvency prospects of SVB. This risk was highlighted in a paper that uses a measure of economic capital that includes this risk (Hirtle and Plosser, 2025) This is one reason why SVB had large holdings of cash and cash equivalents and were very well capitalized (SVB crossed the \$10 billion in 2008, in the middle of the GFC). Second, they were susceptible to a significant downturn in the ability of start-up firms to be able to get additional

financing. A prolonged inability to access the IPO market would cause the large deposits to be drained as the start-up companies burned through their cash.

A third risk, not tied to its exposure to start-up companies but nonetheless problematic, SVB's securities portfolio was large, concentrated primarily in agency securities and MBS. The securities portfolio, totaling about \$4.5 billion, was roughly equal to its loans outstanding. Because SVB was not generating as many loans as deposits, it held an unusually large book of securities. During the period following the GFC, with interest rates at historical lows, such securities holdings had relatively low immediate risk of repricing. However, had interest rates risen quickly as the economy normalized, the interest rate scenarios of +/- 200 basis points reported in their 10K would not have captured their entire risk.

How could this risk have been mitigated? SVB was in San Francisco, CA, one of the higher income areas of the United States. An effort to broaden the deposit base to include more insured deposits that would not be as runnable, and to broaden their loan portfolio to include more CRE, retail loans and more traditional C&I loans would have greatly reduced the concentrated bet. Such an expansion could have been done with de novo branches in Northern California or acquiring a bank that could provide these more traditional regional bank assets and deposits.

The same balance sheet items are shown five years after SVB became a \$10 billion bank holding company, for the end of 2012. In many respects over the five

years, they had increased exposure to their major risks. By the end of 2012, the bank had grown rapidly after the financial crisis to become a \$22.8 billion holding company, \$10 billion larger than the end of 2009. Noninterest bearing deposits had more than doubled, to \$13.9 billion, while interest-bearing deposits had grown only by 1.3 billion. SVB remained primarily a commercial lender, accounting for \$5.6 billion of their \$8.9 billion in total loans. However, with the rapid increase in noninterest-bearing deposits, which had grown dramatically more than the lending, securities were now 55 percent of total assets and still invested in mostly long duration mortgage-backed securities and agency securities.

SVB was a fast-growing bank, however, it was not reducing its exposure to its greatest risks. In fact, those risks were becoming larger. They still held most of their securities as available for sale, while significantly increasing their securities holdings. While interest rates remained quite low, they were able to capture the spread between their securities and their large holdings of noninterest-bearing demand deposits. They were now even more susceptible to runnable deposits from their high concentration of uninsured deposits primarily to the start-up industry. The risk to a quick rise in interest rates and a slowing in the IPO market had only increased.

Rapid Growth but no change in the risk profile

To capture how some of the most important risk factors evolved over time, we show how some of the SVB exposures highlighted in Table 1 changed over time. Figure 1 shows the demand deposits relative to assets for SVB and for all FDIC-insured institutions. The demand deposits, already outsized when SVB first crossed the \$10 billion threshold, became even a larger exposure over the next 10 years, greatly exceeding the average of FDIC-insured institutions. It was not until the Federal Reserve began to normalize interest rates in the two years before the pandemic that demand deposits fell somewhat, likely reflecting a shift into higher interest-bearing accounts. The demand deposits rose somewhat during the pandemic, when interest rates again fell dramatically. However, as coming out of the pandemic interest rates normalized and IPOs significantly slowed down, demand deposits began to fall, finally falling dramatically as the scale of the losses from the securities portfolio became more apparent.

Figure 2 shows that the percentage of uninsured deposits as of the end of the fourth quarter of each year starting in 2017 was extremely high throughout the whole period. In fact, rather than trying to expand the amount of insured deposits, SVB somewhat increased the percentage of uninsured deposits from 2020 through 2023 relative to the previous three years. Rather than mitigating their reliance on uninsured deposits against possible runs, they actually increased their exposure.

Figure 3 shows investment securities as a share of total assets, again comparing SVB to all FDIC-insured institutions. The securities holdings continued to grow in the five years after crossing the \$10 billion threshold. Again, the holdings are outsized relative to other FDIC-insured institutions. Securities holdings increased as interest rates fell during the pandemic, but then continued to rise even as interest rates rose rapidly shortly before SVB failed. While the increased securities holdings did provide liquidity as demand deposits declined, at no time were the securities holdings close to FDIC-insured averages. Since the securities were mostly held in MBS and agency securities, taking such large duration risk throughout this period raises questions about what bank management, the Board of Directors, and bank supervisors were doing.

One reason SVB may not have been more sensitive to the increased duration risk may have been their increased use of held-to-maturity (HTM) accounting rather than available for sale (AFS) accounting. Under HTM accounting the bank can show debt securities at amortized cost rather than at fair market value as long as it intends to hold the securities until maturity. If HTM securities are sold prior to maturity, the remaining HTM securities need to be valued at their fair market value. In effect, this causes the balance sheet carrying value of HTM securities to be unaffected by changes in interest rates. One side effect of this status is that HTM securities cannot qualify for hedge accounting, whereas with AFS securities

management can hedge the risk with derivatives. A final concern is that securities that are relatively liquid are not attractive to sell if rates have increased, since all held to maturity securities would need to be repriced. In effect this makes the securities no longer a good source of liquidity.

Figure 4 shows SVB's AFS securities (at fair value) and HTM securities (at amortized cost). Prior to 2014 SVB held their marketable securities as available-for-sale. In 2014 SVB began to classify more securities as HTM and over time allocated much more of their securities to HTM than the industry average, while also holding a much larger share of securities to total assets. The growth in HTM securities was particularly noticeable as the Fed began to raise short-term interest rates and normalize the balance sheet. While SVB saw a jump in AFS securities when the pandemic began and interest rates declined, it quickly reverted to HTM securities as the Fed began to again normalize the balance sheet and raise interest rates.

At the time of its failure, SVB held only roughly 20 percent of its securities as available-for-sale. As a result, the large losses incurred during periods of rising interest rates did not flow through to earnings or capital. However, a footnote in the financial statements, normally not prominently shown, reports the losses in the HTM portfolio. Figure 5 plots the fair value-to-book value ratio for both AFS and HTM securities, with the 2-year Treasury yield superimposed. Starting from the

first quarter of 2022, both portfolios show steep declines in fair value in near lockstep with rate hikes, with the larger decline for HTM securities hinting at their longer duration.

At the same time that the risks from runnable uninsured deposits and large securities holdings continued to grow, the bank continued to limit its loan portfolio to industries highly sensitive to the health of the start-up sector, by issuing most of their loans to high-tech, bio-tech, and private equity companies. Table 2 shows the results of comparing the correlation between the QQQ index and individual bank stocks in the Nasdaq bank index (NBI). The sample comprises banks that were members of the NBI as of 1/1/10, had more than \$10 billion of assets as of that date, were traded at least once per day on 99 percent of the observed days, and were not acquired, delisted, or otherwise inactive for at least 90 percent of the time. Of the 119 banks in the sample, SVB has the second largest correlation, with a correlation of 64 percent. The only bank with a larger correlation to the QQQ is Northern Trust, a custodian bank that receives significant income tied to stock market valuation rather than traditional lending. SVB's poorly diversified loan portfolio focused on private equity and high tech made it much more susceptible to troubles in the IPO market, which did occur after the pandemic.

Throughout the period since it crossed \$10 billion, there is little evidence that the bank actively chose to alter its risk profile, or that regulators were forcing

the bank to alter its risk profile (which will be discussed in the next section).

However, this inattention to a growing risk profile was not because the bank was becoming less important.

Figure 6 shows that SVB asset growth was dramatically faster than the industry. From a \$10 billion dollar bank in 2008, it grew to be \$208 billion at its time of failure in 2023. Such explosive growth should have resulted in bank management and the board of directors significantly increasing their risk monitoring. Similarly, growing much more rapidly than peers should have caused bank supervisors to significantly increase their focus on risk management of SVB. However, as the previous tables and graphs highlight, the risk profile was quite risky from the time it crossed \$10 billion, and little of its primary risks were reduced over the subsequent two decades.

In part this inattention may have been because SVB was so profitable. Figure 7 shows the daily cumulative returns of SVB and the Nasdaq Bank Index from 1/1/10 to 3/10/23. SVB showed cumulative returns far in excess of the NBI right up until its failure. The excess returns occurred in part because of a high-risk profile that funded long-term securities with largely uninsured demand deposits that were not interest bearing. This extremely risky duration bet was unlike the typical source of bank problems, poor underwriting and large credit risk. SVB had a concentrated loan exposure, but its real risk was dependence on deposits from

start-up firms invested in long-term securities. The next section will discuss in more detail the implications for bank supervision of SVB.

The Role of Bank Supervision

Normally it is difficult to assess bank supervision practices because exam reports, bank exam findings, and supervisory ratings are not made public. The Barr Report, which examined the role of bank supervision, made most of this data available from 2017 until the SVB failure. SVB in 2017 was classified as a regional banking organization (RBO) which covers banks from \$10 to \$100 billion in assets. Once the bank is over 100 billion dollars, its is moved to the large and foreign banking organization (LFBO) supervision. When a bank moves to a higher group there is more frequent and more tailored supervision. For the LFBO there is not only continuous monitoring and a central point of contact of a bank supervisor, but in addition there are dedicated supervisory teams, horizontal examinations between similar institutions, greater Board of Governors involvement, and focus on a firm “to lower the probability of failure or inability to serve as a financial intermediary” (Barr Report, pg. 30).

There are ratings given to both the holding company (RFI rating – risk management, financial condition, impact), and to the bank (CAMELS rating – capital, asset quality, management, earnings, liquidity, and sensitivity to market

risk). For simplicity I will focus on the supervision of the bank. Table 3 shows the CAMELS ratings from 2017 until the bank failed in 2023. What is striking is that all the ratings were strong or satisfactory – indicating no significant concern that risks could lead to failure. It was only in August of 2022, less than 8 months from failure, that management and the composite rating were downgraded to less than satisfactory.

To place this timing in context, SVB share price peaked in November 2021. After November, the stock price continued to decline significantly. The drop in the share price indicates that shareholders were becoming concerned about potential interest rate increases by the Fed. Given the very large percentage of uninsured deposits and the mounting losses in its held-to-maturity portfolio, bank supervisors should have been extremely concerned about the solvency of SVB. This should have resulted in both lower ratings and an enforcement action mandating remedial action and increased coordination with the discount window should the situation get worse.

It is important to note that the institution had not changed its risk profile. It had always been dependent on low-cost uninsured deposits financing a very large long-duration securities portfolio and a loan book highly concentrated in the tech industry. While this had been a problem with the business model the entire time, even when the macroeconomic conditions had changed and interest rates were

rising quickly, forceful action was not taken. To be really useful, supervisors should have been highlighting these risks all along and pushing the institution to expand insured deposits, increase loans to other sectors, and reduce the duration of its securities portfolio.

The Barr report notes that a December 2022 internal memo noted that if SVB was forced to liquidate its securities portfolio to fund unexpected net deposit outflows it would be a problem. However, by the time of the memo (Dec. 2022) SVB had that year already experienced \$49 billion of net client outflows, a silent run had already begun. While supervisory actions could have and should have been more forceful in 2022, the inherent problems with the business model should have been addressed 15 years earlier when they first crossed the \$10 billion threshold to become a regional bank. The risks were taken throughout SVB's history, the risks were realized as the rapid rise in the federal funds rate began in 2022.

When long duration securities are locked in held-to-maturity accounts and the institution is highly dependent on runnable uninsured deposits there is little the institution can do. The actions require understanding the underlying risks and guiding the institution to alter its actions before extreme losses are realized. This is particularly true for an institution that grew extremely rapidly and had excess returns relative to peers throughout the period.

There were additional warning signs of impending problems. The share price peaked in November 2021 and then declined relatively significantly, probably reflecting the likelihood that extremely loose monetary policy would soon be ending. Bank supervisors should have been seeing the share price starting to decline more rapidly (and aware that tighter monetary policy was likely), and as part of continuous monitoring, should have been asking what shareholders were seeing. As noted earlier, deposit outflows began in 2022, a significant loss of depositors should also cause continuous monitoring to ask why.

A more formalized model could imply a switching regression to determine when the market is seeing a significant change in the return structure. A switching regression model that includes the QQQ index, reflecting SVB's highly concentrated loan book and exposure to tech equity conditions, finds a break in the model in July 2020¹. Figure 8 reports the Chow F statistic evaluated over candidate break dates. Table 4 then shows the coefficients and the results of the Wald test of the regression using both the QQQ and the Nasdaq Bank Index, evaluated at the July 2020 break identified. The Nasdaq Bank Index is added because, while the specification with QQQ alone provides a clearer signal of break², the joint

¹ Returns are winsorized at the 1 percent level in both tails to limit the influence of extreme observations. In addition, candidate break dates are restricted so that each side of the selected break contains at least 15 percent of the sample, ensuring that the estimated split is not driven by very short endpoint windows.

² In the jointly specified model, the Chow F statistic displays several elevated regions and local peaks rather than a dominant spike, reflecting the presence of instability along multiple dimensions and making the timing of a break less defined.

specification helps ensure that changes in the relationship are not attributed solely to the technology index when they may reflect banking or broader market conditions, and allows a clearer economic interpretation of how exposures evolve across periods. The result indicates a significant difference in the two periods. Particularly notable is the coefficient on QQQ roughly doubles in the second period. The increase is statistically significant under the Wald test reported with the switching regression. This is a period where the IPO market was frozen, likely causing some draw down of start-up deposits and challenges for some of the start-up loans.

These switching regressions illustrate that the stock behavior of SVB was changing, and well before bank supervision was altering its ratings to reflect concerns with the risk profile. Identifying risks after the losses have been incurred is usually too late, the time for supervisory intervention should have been much earlier and more on-going.

In the appendix we show that default models and credit ratings show very similar attributes to the supervisory ratings, they capture the risk only after the losses have been realized not when the risks are being taken. In the appendix we illustrate with two complementary distance to distress models as well as the ratings by the ratings agency, both of which primarily move only when the losses are incurred. Both limitations arise by construction: distance to distress measures are

anchored to book-based inputs that can mask underlying risk until it suddenly becomes visible, while ratings are intentionally slow moving and typically change only after events force action. As a consequence, neither provides a reliable tool for ongoing supervisory monitoring.

Note that there were annual exams with ratings every year from 2017 to 2022. The biggest risk throughout this period was that more than 90 percent of the deposits were uninsured, and the money was invested in long-duration mortgage securities and loans to firms highly dependent on the IPO market doing well. Had stress tests and liquidity requirements been applied to \$50 billion banks (See regulatory change in the next section) more forceful actions would likely have been required. However, bank supervisors had plenty of opportunity through the exam process to mitigate these risks, but did not.

A second opportunity to alter the risks posed by SVB occurred through the merger process. Applications for mergers can be held up if there are concerns with risk management and possible increased risk to the financial stability of the banking system. While there were several application K filings focused on relatively small foreign operations, there was one domestic merger that could have provided leverage for more forcefully mitigating the long-standing risks. In February, 2021 SVB filed an application to acquire Boston Private Financial Holdings. At the time SVB exceeded \$100 billion and Boston Private exceeded

\$10 billion, requiring the Board of Governors to consider whether there were financial stability concerns created by the merger. Boston Private had several similar characteristics to SVB. It was efficient at getting large uninsured deposits and mainly catered to wealthy customers, primarily on the East Coast.

The Board chose to approve the application in June 2021, less than two years before SVB failed. Had this merger been with a more traditional regional bank it would have provided a broader base of insured deposits, a more diversified loan portfolio, and less reliance on long-duration securities. Unfortunately, this merger only exacerbated existing problems, as can be seen in the earlier charts that show both securities and uninsured deposits were actually higher after the merger. This was a missed opportunity, presumably because the governors did not fully appreciate the risks associated with the SVB business model.

Bank Regulation and SVB

Under Dodd-Frank bank holding companies with over \$50 billion in assets were subject to enhanced prudential standards. These enhanced prudential standards included stress tests, higher liquidity requirements, and resolution planning. Had these enhanced standards been applied to SVB, it is hard to imagine that the risk profile could have remained the same. Any stress test with significantly higher interest rates or liquidity requirements that would have shown

the problems of runnable uninsured deposits would likely have forced significant changes to SVB's business model.

Not surprisingly, the regional banks were opposed to the application of these higher standards. In fact, SVB was vocal in their opposition. In testimony before the Senate Banking Committee on March 15, Greg Becker, the CEO of SVB wrote, "We urge Congress to act quickly to increase the \$50 billion threshold and create a new asset-level floor below which enhanced prudential standards will not apply." He went on to explain, "Given the low risk profile of our activities and business model, such a result would stifle our ability to provide credit to our clients without any meaningful corresponding reduction in risk." Similar sentiments were found in testimony from other regional banks.

The lobbying effort by the regional banks was successful and Congress passed the Economic Growth, Regulatory Relief, and Consumer Protection Act in 2018. The legislation raised the enhanced standards from \$50 billion to \$250 billion but required the Federal Reserve to determine what standards to apply to banks from \$100 billion to \$250 billion.

The Board of Governors adopted a rule in 2019 that provided a "tailored response," which created four categories of enhanced prudential standards based on size and complexity of the organization. In 2021 SVB crossed the \$100 billion threshold but because of the transition rules the stress testing, the liquidity

coverage ratio and the net stable funding ratio were not applied. Had these rules been applied it would have required significant adjustments to the operating model of SVB. In particular, the requirement to recognize losses on AFS securities would have lowered capital and increased scrutiny of the large HTM securities portfolio, likely raising questions of whether SVB could credibly hold the securities to maturity. At the very least, there would have been increased attention to liquidity and the possibility that uninsured deposits would not have been a stable source of funds.

Note that both the tailoring and the transition rules were at the discretion of the Board of Governors rulemaking. Given that after the transition the rules would have been more stringent, it is surprising that supervision had not taken a more forceful supervisory approach as the tailoring rules were being discussed and adopted.

Could Regulation and Supervision Have Reacted Earlier?

The underlying risk of uninsured deposits funding a long-duration portfolio of Treasury and Agency securities had been a potential issue through most of SVB's history. However, there were key periods where heightened attention to the risks could have changed management's behavior. It is also worth noting that while there were increases in both uninsured deposits and held to maturity

securities in the last two years, both these positions had already been large outliers for some time.

Figure 9 shows the uninsured deposits to total deposits. The chart looks at SVB's ratio compared to that of all other regional banks from \$10 billion to \$250 billion by percentile. The dashed line for SVB shows very little change in the 10 years leading up to its failure, with SVB close to the 99th percentile throughout the period. Figure 10 shows uninsured deposits divided by total assets. It is quite similar with SVB's ratio close to the 99th percentile throughout the period with some gradual decline prior to failure.

On the asset side, Figure 11, SVB HTM securities to total securities is also notable, rising from 2014 to 2019 to the 95th percentile. The ratio dropped during the pandemic when interest rates fell dramatically and then rose quickly back to the 95th percentile prior to failure. Not only are the percentage of HTM securities high relative to regional peers, but so is securities as a share of total assets (Figure 12), which is at the 95th percentile for the 10 years up to failure.

Figure 13 shows the unrecognized losses on the HTM securities relative to equity. When interest rates rose prior to the pandemic, SVB had significant losses that placed them above the 95th percentile, before dropping after the pandemic, only to rise even more as the Fed began to raise rates rapidly to counteract inflation.

In summary, the risk being taken was not only in the final 2 years, SVB was at significant risk relative to rising interest rates but was fortunate that it grew its securities portfolio during a period of unusually low interest rates. SVB management was aware of the risks because they altered the holdings of HTM securities to increase HTM securities during periods they expected rates to rise.

The first major instance that could have generated a behavioral change with SVB management is when they first chose to move securities from available for sale to held to maturity. Bank management did highlight this change in the 2015 annual report (91).

“During the second quarter of 2014, we re-designated certain securities from ...available-for sale” to held to maturity... with a total carrying value of \$5.4 billion at June 1, 2014.”

They provided little discussion of the motivation, other than they had intent to hold the securities to maturity. However, it is notable that there were significant discussions of the Fed ending QE around this time, signaling a move to normalize interest rates. By the end of the year the held to maturity portfolio had grown to 7.4 billion of mostly agency securities, compared to 13.5 billion of mostly Treasury securities in available for sale. With the rapid movement into held to maturity securities and with most of the deposits uninsured, this would have been a good

time to review the pricing and interest rate risk of such a large securities portfolio. Unfortunately, the Barr report provided little color on actions taken prior to 2017.

By the end of 2017, the held to maturities securities of 12.6 billion, exceeded the available for sale securities of 11.1 billion. Thus from the end of 2014 to the end of 2017 SVB had decreased their securities holdings in available for sale while significantly increasing their held to maturity securities.

One way examiners could show concern with the increased reliance on held to maturity with most deposits being uninsured would be to downgrade CAMELS ratings to reflect the increased risk. The CAMELS ratings components in 2017 were all 2's except for a 1 in liquidity risk. The ratings at that time were described in SR96-38:

“Practices should reflect the ability of the institution to manage unplanned changes in funding sources, as well as react to changes in market conditions that affect the ability to quickly liquidate assets with minimal loss. In addition, funds management practices should ensure that liquidity is not maintained at a high cost, or through undue reliance on funding sources that may not be available in times of financial stress or adverse changes in market conditions.”

The supervisory guidance also highlights the availability of assets readily convertible to cash without undue loss and the trend and stability of deposits. Held to maturity securities cannot be easily sold without incurring losses in a rising

interest rate environment. Note that held to maturity securities cannot generally be hedged, since they are pledged to be held to maturity. In addition, uninsured deposits were concentrated in venture capital financed firms, a sophisticated group that given the lack of insurance were more likely than most depositors to run. It is hard to see that these facts were consistent with a 1 rating. A downgrade to 2 with risk of further declines clearly discussed with management and the Board could have caused SVB to diversify its deposit base and consider broadening out its lending. As the earlier CAMELS table highlighted the 1 rating was maintained through 2021. This also was an opportunity to issue a MRIA (Matter Requiring Immediate Attention of the Board) and require a liquidity stress test.

A second opportunity to discuss the risks of the strategy is in the discussion of sensitivity to market risk. The Fed supervisory guidance on sensitivity to market risk highlights:

“The sensitivity of the financial institution's earnings or the economic value of its capital to adverse changes in interest rates, foreign exchanges rates, commodity prices, or equity prices.”

Again there was an opportunity through a threat of a downgrade for this rating that reflected how the interest rate risk of holding long duration securities could

undermine confidence in a company with mostly uninsured deposits.

Unfortunately, this rating was not changes from 2017 until the SVB failure.

The large unrealized losses on the HTM portfolio prior to the pandemic would have been a second opportunity to raise concerns. Possibly moving to an informal action to model resilience to a rising interest rate environment. The HTM losses were an outlier, and because it was at a time when the Fed was discussing how to tailor their rules, they should have been examining outlier positions that would be impacted by the rule changes. Presumably there was too much reliance on the CAMELS ratings which had not appropriately captured the risk to the institution of a rising interest rate environment.

The merger application for the acquisition of Boston Private in 2021 should have been given a conditional approval requiring that a comprehensive liquidity stress test to the new standards be a condition of approval. SVB had MRA's focusing on liquidity and liquidity modeling and it was a fast growing bank that would quickly breach the \$100 billion threshold.

By the beginning of 2022, the stock price was falling, interest rates were rising, HTM losses were rising and little had been done to resolve SVB's MRAs. A formal enforcement action, particularly if supervision had taken more forceful action earlier, would have been appropriate.

In summary, the bank held a risky interest rate bet with uninsured deposits and long maturity securities for over a decade. There were plenty of opportunities to more forcefully try to change bank behavior, but those opportunities were not taken. While slow to go from findings to action was a problem, these were long standing findings that had not been addressed in the supervisory process. The CAMELS process failed to highlight these concerns until the rapidly rising interest rates made it painfully obvious.

Persistence of Balance Sheet Vulnerabilities

As Tables 6 and 7 show, looking at institutions with assets between \$10 billion and \$250 billion, the current situation is not materially different from that observed at the last reporting period before the SVB's collapse. Table 5 ranks banks by the ratio of uninsured deposits to total deposits, while Table 6 ranks banks by HTM as a share of total assets. Across both measures, neither the identities of the banks appearing at the top of these rankings nor the level of the ratios differs substantially from the pre-collapse period.

Silicon Valley Bank was simultaneously vulnerable on both sides of the balance sheet and that combination generated extremely profitable returns and ultimately contributed to the bank's collapse once interest rates increased rapidly. However,

the absence of banks that in 2025 exhibit that same combination of exposures should not be interpreted as evidence that systemic risk has materially declined: Silicon Valley Bank was uniquely vulnerable to a sharp increase in interest rates because its balance sheet was highly exposed to that specific shock. The next stress episode may originate from a different source, and the persistence of elevated bank exposures on either the asset side or the liability side suggests that the underlying sources of vulnerability remain broadly similar to those observed prior to the 2023 banking failures.

Conclusion

The problems of a dependence on uninsured demand deposits funding long duration securities and a highly concentrated loan portfolio was a long-standing problem - for over 15 years. While this positioning was quite risky, it was also quite profitable during a period of low interest rates and booming start-ups. However, a slowdown in the tech industry and higher interest rates would have been an obvious scenario to be concerned about. The problems with supervision were not new, and likely difficult to correct regardless of the supervisory actions taken in the last year of SVB's existence. The focus of remediation when risks manifest themselves rather than when they are taken on is a more endemic problem for bank supervision. Reducing the duration of the HTM securities and the

dependence on runnable uninsured deposits could have been much more easily addressed by more attention to risk management over the previous 15 years of exams.

The Board of Governors could have applied more stringent tailoring rules or used the merger with Boston Private to require more forceful action. These were lost opportunities.

SVB highlights a more fundamental problem with how the Federal Reserve supervisory process considers risk management. The focus on process rather than risk allowed a risky business model to persist.

It is important to note that many banks still have significant uninsured deposits and hold significant held to maturity securities. Table Six shows banks with the highest ratio of uninsured deposits to total deposits as of 2022:4 (top panel) and 2025 (lower panel). What is striking is how many banks, including some large banks, are in both lists even after the SVB failure. Table Seven shows banks with the highest ratio of held to maturity assets to total assets as of 2022:4 (top panel) and 2025 (lower panel). Again what is striking is how many banks, including some large banks, are in both lists even after the SVB failure.

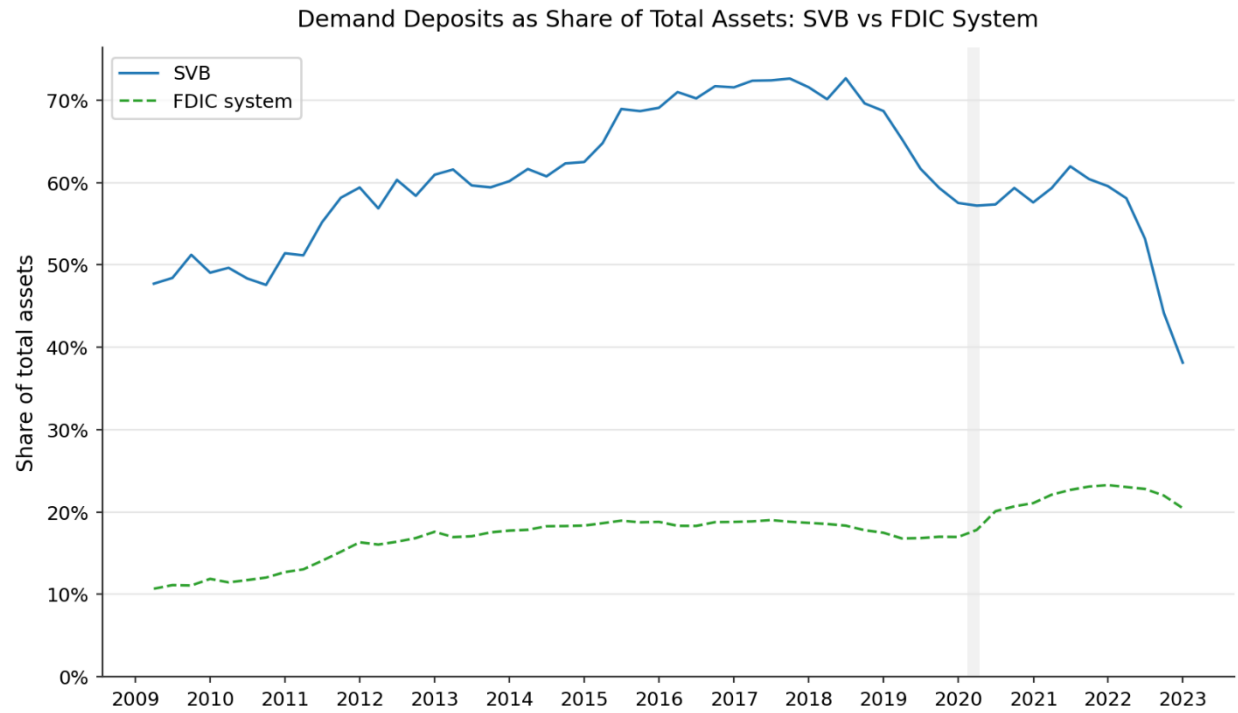
Table 1

SVB Selected Balance Sheet Items 2008, 2009, 2012

	2008 (\$ Billions)	2009 (\$ Billions)	2012 (\$ Billions)
Cash and cash equivalents (FF,RP)	2.4	3.5	1
Investment securities	1.8	4.5	12.5
Total loans	5.5	4.5	8.9
Total assets	10	12.8	22.8
Noninterest-bearing deposits	4.4	6.3	13.9
Interest-bearing deposits	3.1	4	5.3
Total equity	1	1.1	1.8
Loan Concentrations			
Technology	2.7	2	4.4
Private equity	1.1	0.9	1.7
Life sciences	0.6	0.5	1.1
Premium wine	0.4	0.4	0.1
Total commercial loans	4.5	3.6	7.6

Figure 1

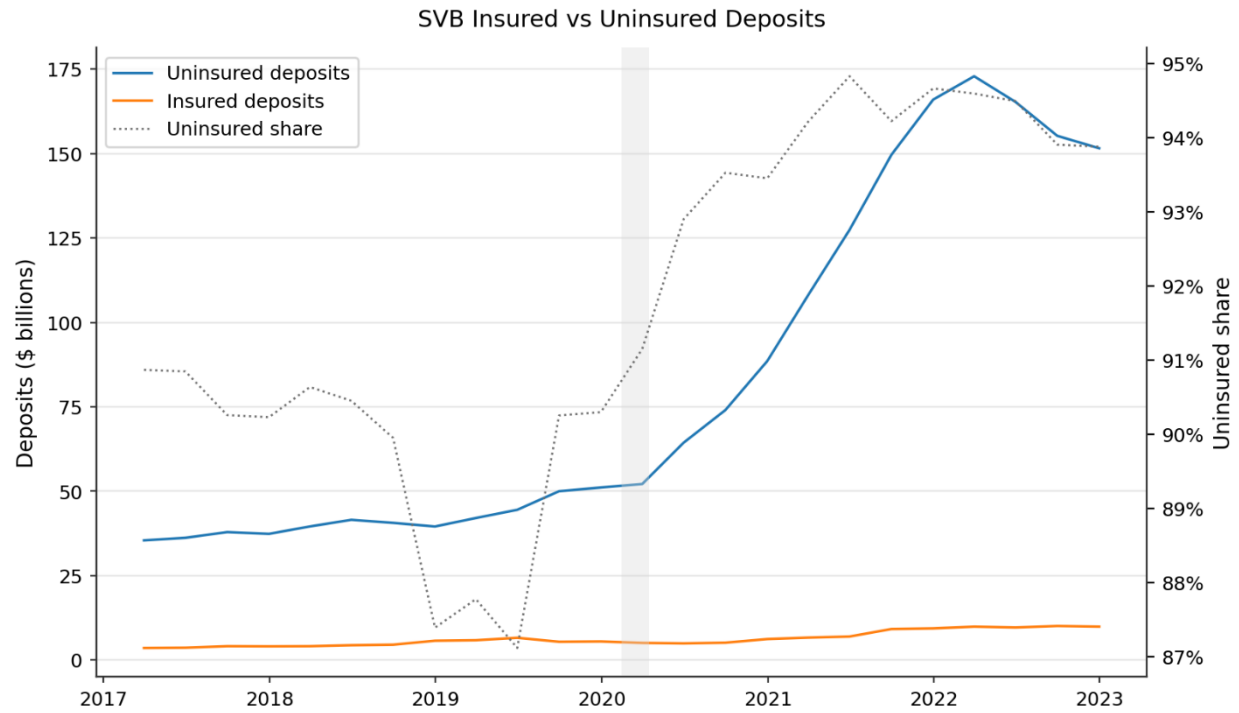
Demand deposits as a share of total assets: SVB vs FDIC system



Source: Bloomberg, FDIC Quarterly Banking Profile, FFIEC Call Reports

Figure 2

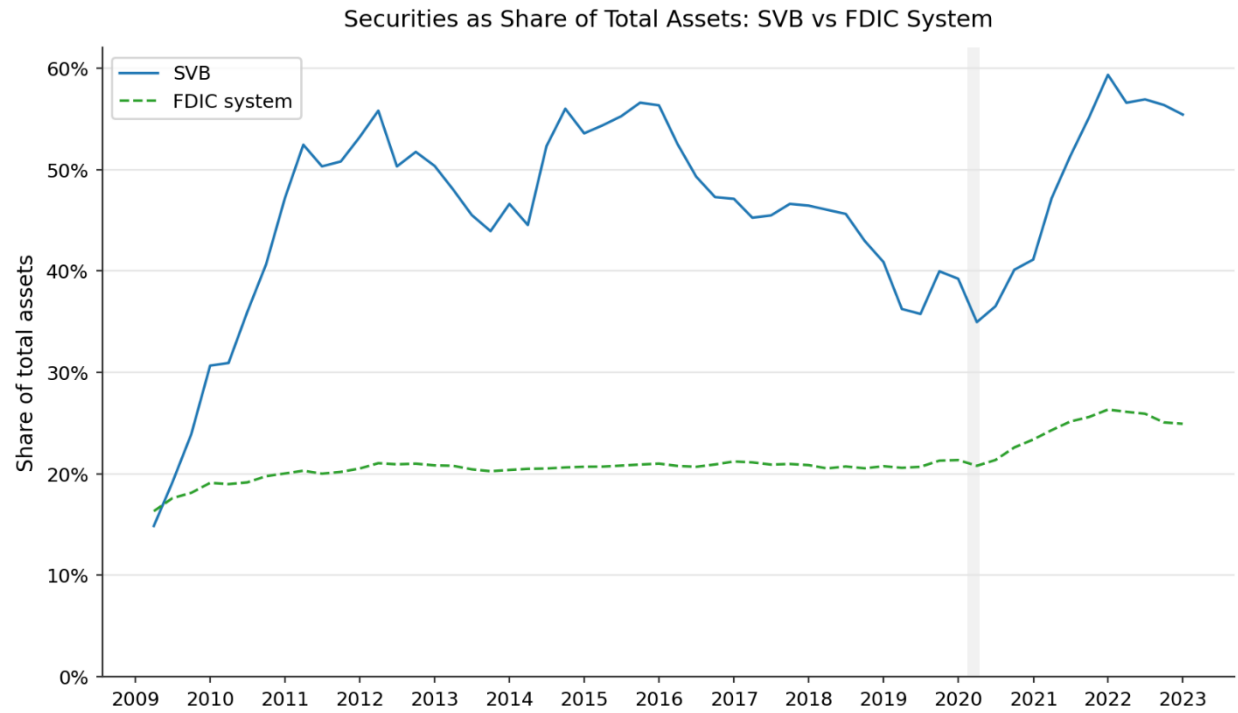
Percentage of uninsured domestic deposits



Source: FFIEC Call Reports

Figure 3

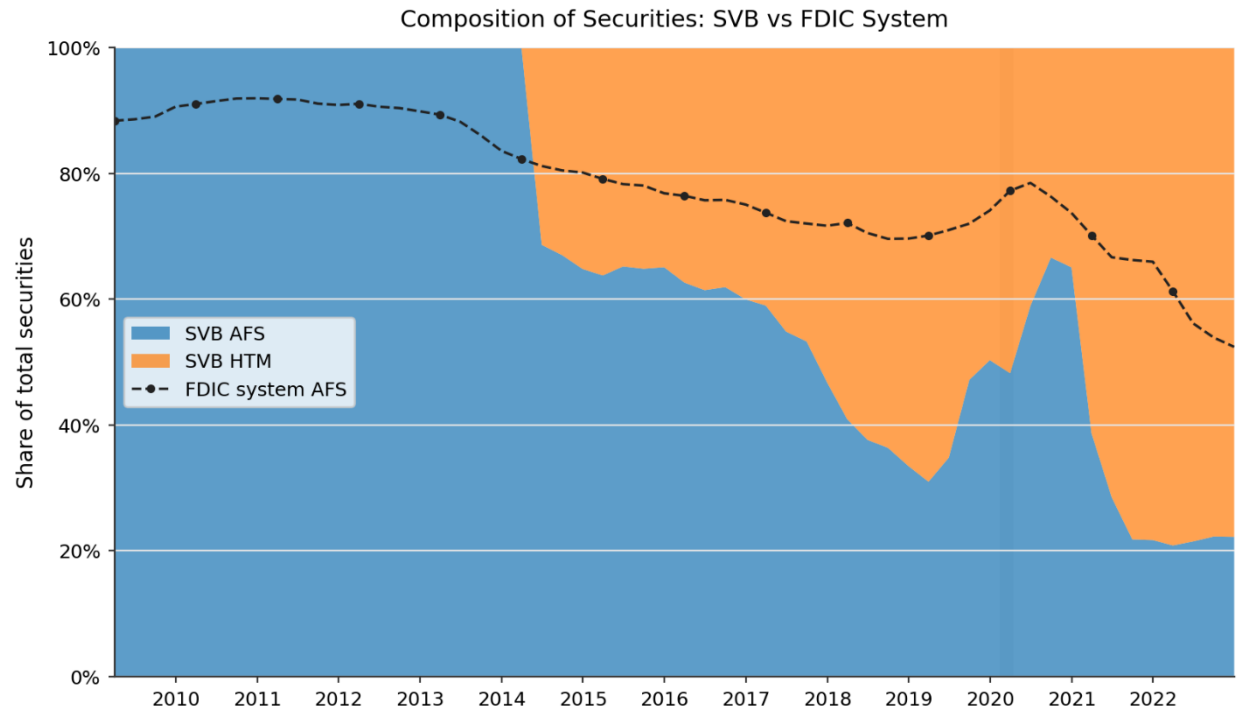
Investment securities as a share of total assets: SVB vs FDIC system



Source: Bloomberg, FDIC Quarterly Banking Profile, FFIEC Call Reports

Figure 4

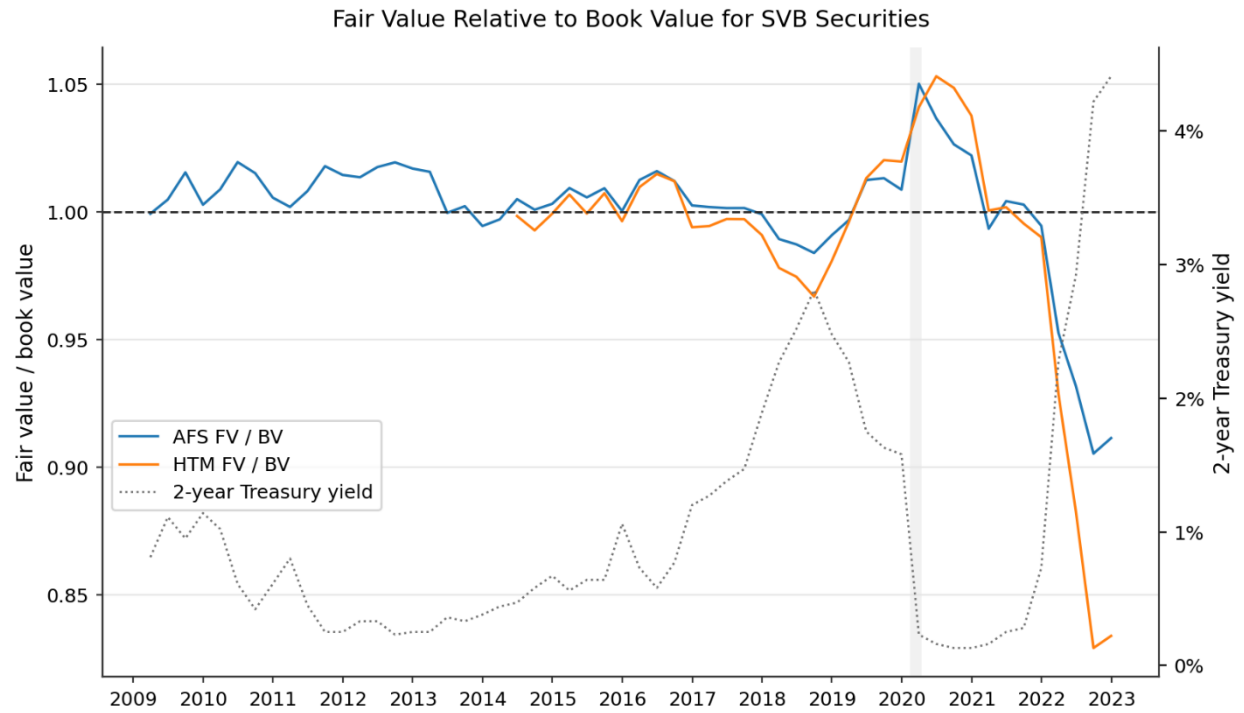
Composition of investment securities: AFS and HTM, SVB vs FDIC system



Source: Bloomberg, FDIC Quarterly Banking Profile, FFIEC Call Reports

Figure 5

Fair value-to-book value ratio for SVB's AFS and HTM securities vs 2-year UST



Source: FRED, Annual reports, Bloomberg

Table 2

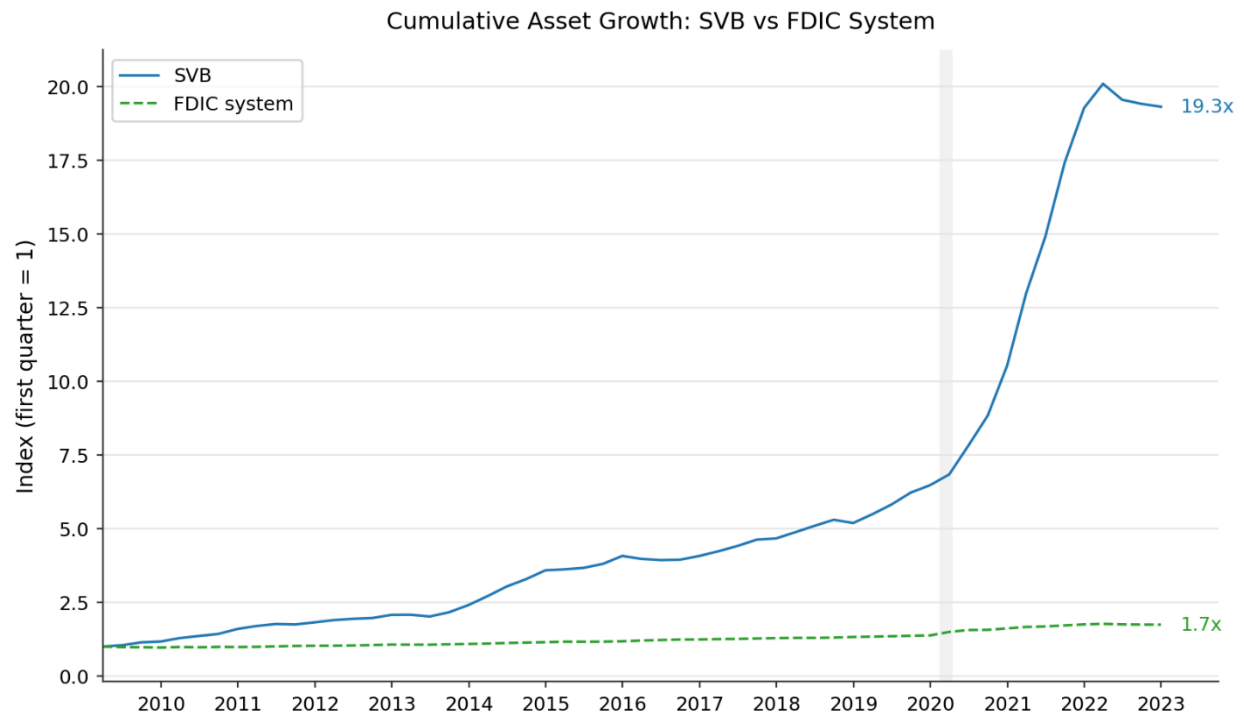
Top 15 bank correlations with QQQ - 01/2010-07/2020

Name	Correlation
Northern Trust Corp	0.673
Silicon Valley Bank	0.641
Cathay General Bancorp	0.621
Commerce Bancshares Inc	0.618
Fifth Third Bancorp	0.613
Glacier Bancorp Inc New	0.603
N B T Bancorp Inc	0.599
International Bancshares Corp	0.597
Westamerica Bancorporation	0.596
East West Bancorp Inc	0.594
Trustmark Corp	0.590
Umpqua Holdings Corp	0.589
Huntington Bancshares Inc	0.584
United Bankshares Inc	0.583
Fulton Financial Corp Pa	0.583

Source: CRSP

Figure 6

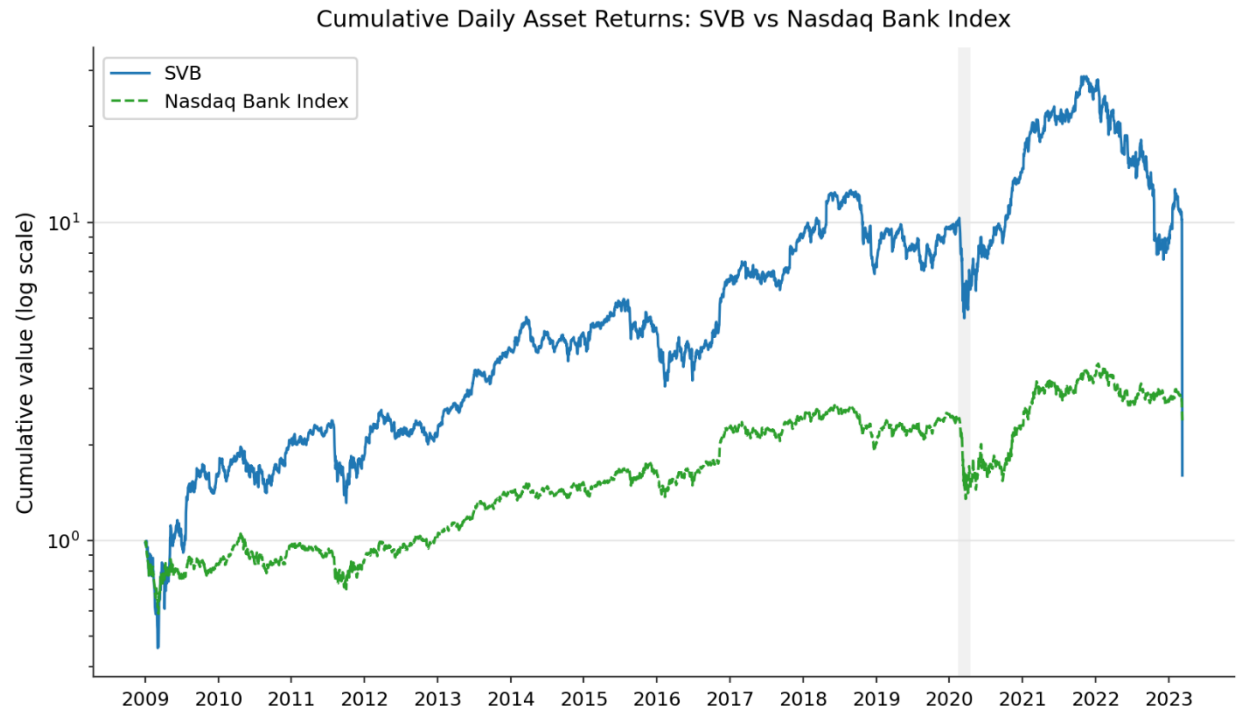
Cumulative assets growth: SVB vs FDIC System



Source: FDIC Quarterly Banking Profile, FFIEC Call Reports

Figure 7

Cumulative daily asset returns: SVB vs Nasdaq Bank Index



Source: CRSP, Bloomberg

Table 3

Bank supervisory ratings – CAMELS

Report Date	Capital	Asset quality	Management	Earnings	Liquidity	Sensitivity to market	Composite
17-Mar	2	2	2	2	1	2	2
18-Feb	2	2	2	2	1	2	2
19-Mar	2	2	2	2	1	2	2
20-Apr	2	2	2	2	1	2	2
21-May	2	2	2	2	1	2	2
22-Aug	2	2	3	2	2	2	3

Source: Barr Report

Rating scale

1 = Strong; 2 = Satisfactory; 3 = Less than satisfactory; 4 = Deficient;

5 = Critically deficient.

Table 4

Switching regression results and Wald test with one break

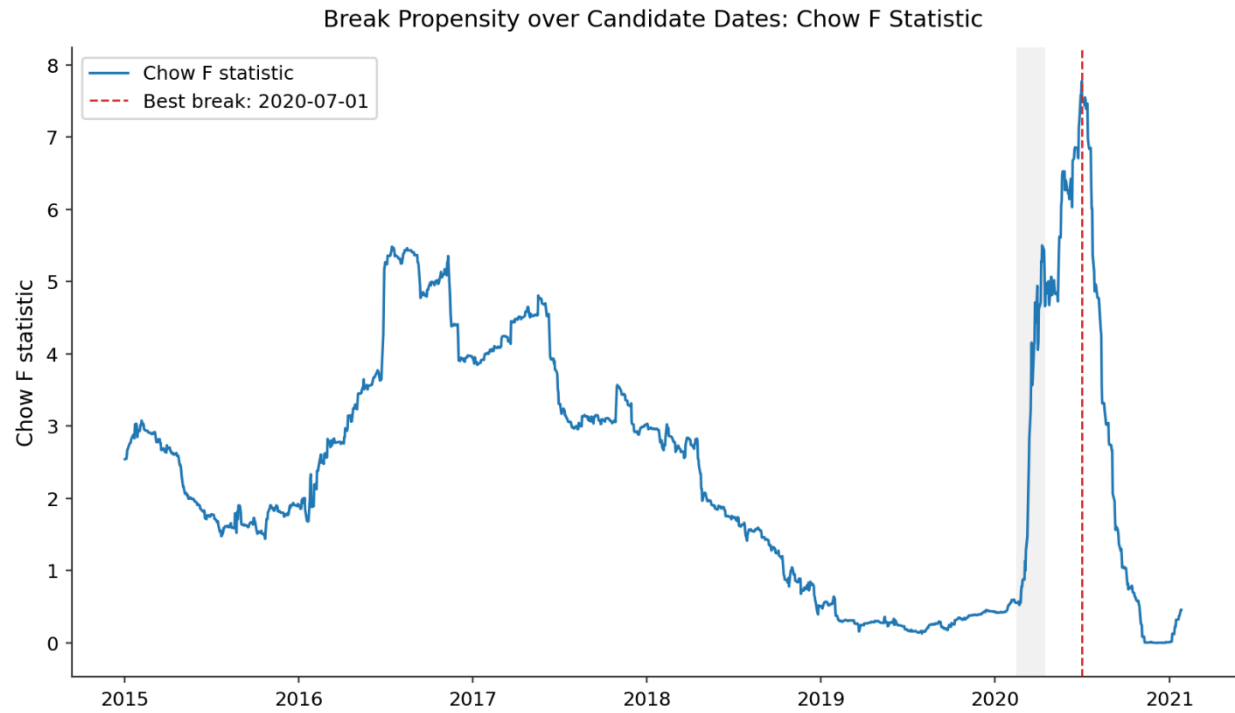
	Specification: SVB ~ QQQ + NBI		
	(Baseline) SVB	(Pre 01/07/2020) SVB	(Post 01/07/2020) SVB
Const	0.000 (1.33)	0.000 (1.69)	0.000 (0.17)
QQQ	0.357 (11.85)	0.248 (6.52)	0.538 (10.70)
NBI	1.153 (47.42)	1.197 (38.42)	1.126 (27.84)
R ²	0.699	0.707	0.689
N	3543	2871	672

	Wald test	
	Chi-Square	p-value
Const	0.240	0.624
QQQ	21.267	0.000
NBI	1.914	0.167

Source: CRSP, Bloomberg

Figure 8

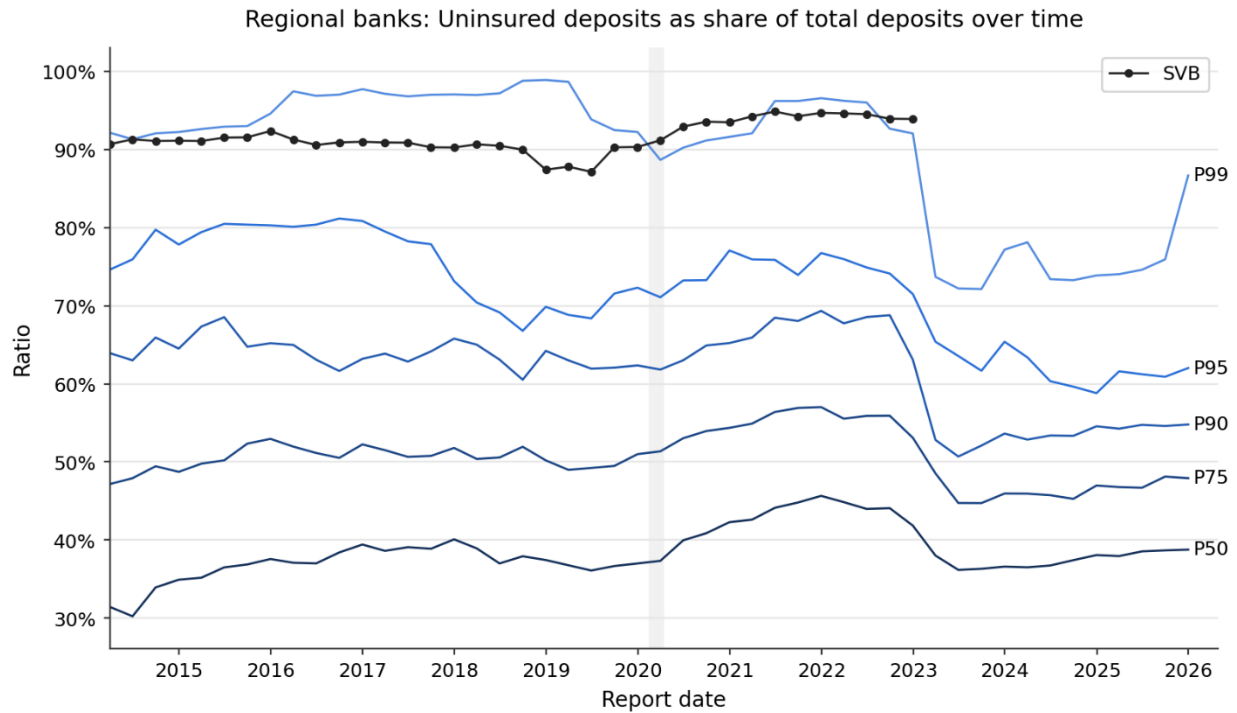
Chow test evidence of structural break propensity with QQQ over time



Source: CRSP, Bloomberg

Figure 9

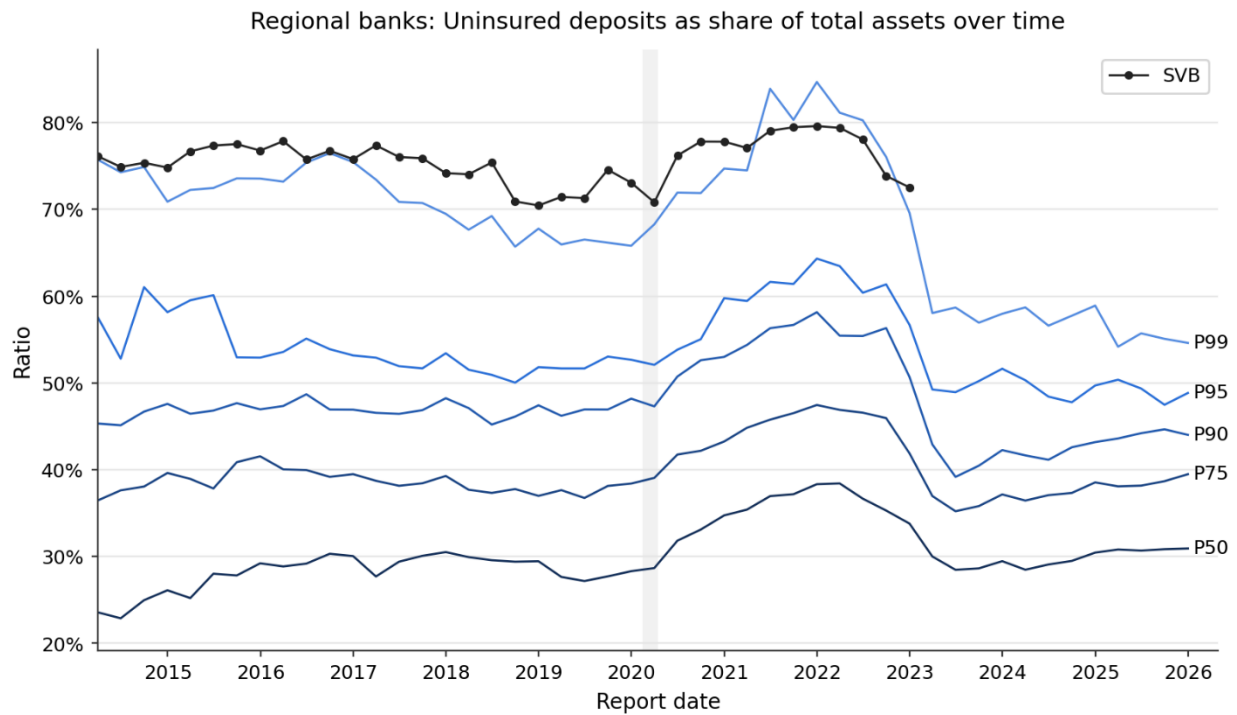
Uninsured deposits as a share of total deposits: SVB vs banks with \$10 billion to \$250 billion in assets



Source: FFIEC Call Reports

Figure 10

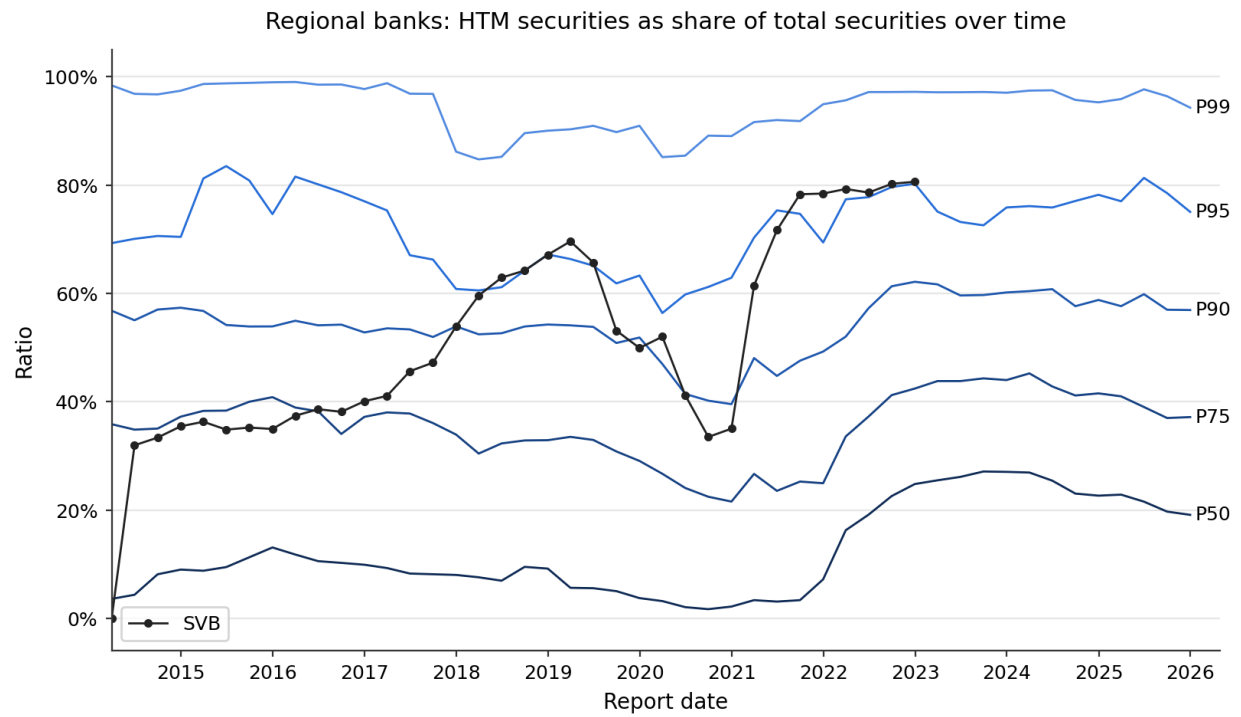
Uninsured deposits as a share of total assets: SVB vs banks with \$10 billion to \$250 billion in assets



Source: FFIEC Call Reports

Figure 11

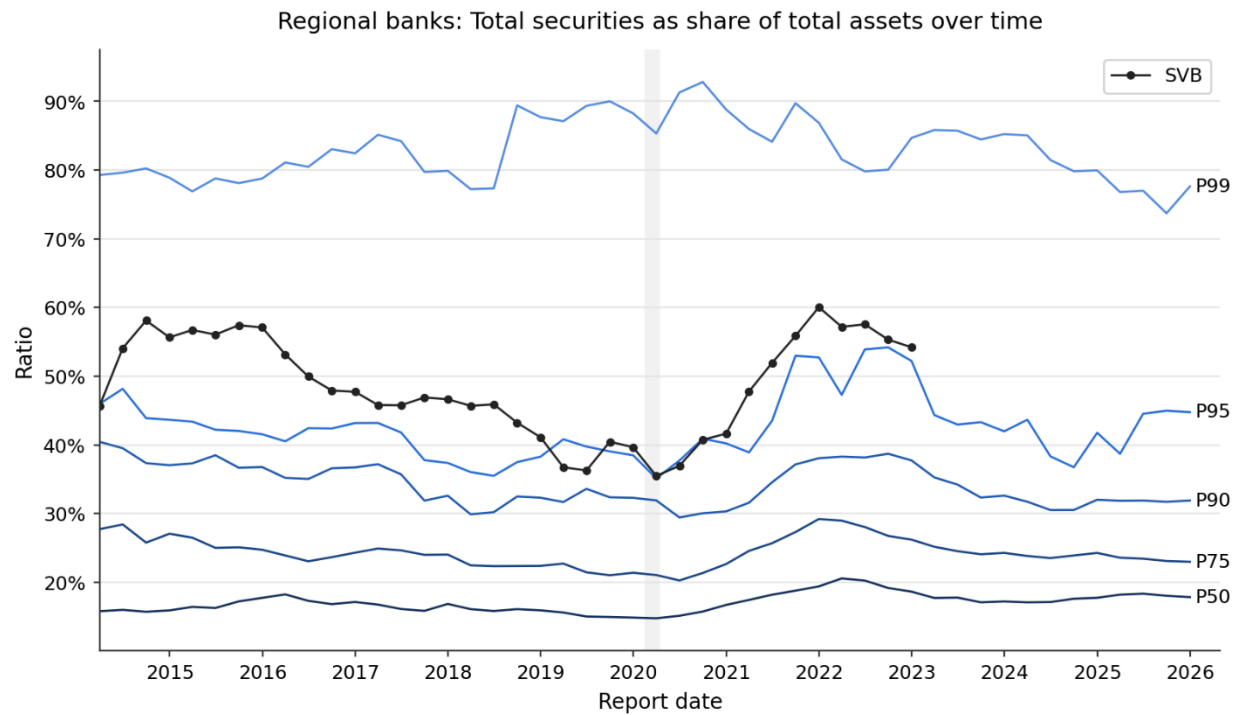
HTM securities as a share of total securities: SVB vs banks with \$10 billion to \$250 billion in assets



Source: FFIEC Call Reports

Figure 12

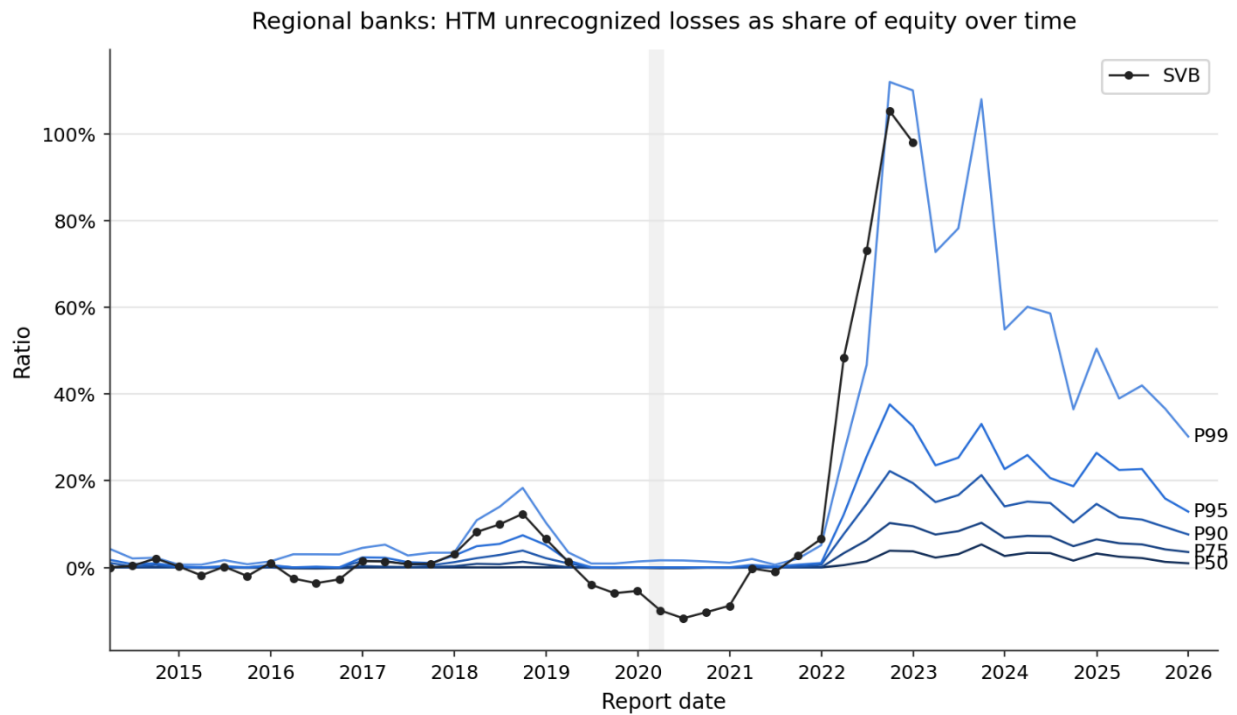
Total securities as a share of total assets: SVB vs banks with \$10 billion to \$250 billion in assets



Source: FFIEC Call Reports

Figure 13

HTM unrecognized losses as a share of bank equity: SVB vs banks with \$10 billion to \$250 billion in assets



Source: FFIEC Call Reports

Table 5

Uninsured deposits as a share of total deposits: 2022Q4 vs 2025Q4

Top-10 2022Q4			
Bank	Uninsured Deposits (\$000s)	Total Deposits (\$000s)	Ratio
1 DEUTSCHE BANK TRUST COMPANY AMERICAS	26,064,000	27,059,000	96.30%
2 SILICON VALLEY BANK	151,592,000	161,582,000	93.80%
3 SIGNATURE BANK	79,458,961	88,978,978	89.30%
4 CIBC BANK USA	29,985,744	40,993,106	73.10%
5 UMB BANK, NATIONAL ASSOCIATION	24,657,778	34,596,819	71.30%
6 NORTHERN TRUST COMPANY, THE	36,467,423	51,291,437	71.10%
7 HSBC BANK USA, NATIONAL ASSOCIATION	95,476,917	134,554,625	71.00%
8 FIRST REPUBLIC BANK	119,470,758	177,134,444	67.40%
9 BNY MELLON, NATIONAL ASSOCIATION	17,851,000	26,470,000	67.40%
10 SERVISFIRST BANK	7,660,850	11,577,969	66.20%

Top-10 2025Q4			
Bank	Uninsured Deposits (\$000s)	Total Deposits (\$000s)	Ratio
1 DEUTSCHE BANK TRUST COMPANY AMERICAS	28,932,000	31,281,000	92.50%
2 NORTHERN TRUST COMPANY, THE	38,655,477	53,663,458	72.00%
3 CIBC BANK USA	33,721,433	50,468,940	66.80%
4 HSBC BANK USA, NATIONAL ASSOCIATION	88,322,392	132,251,224	66.80%
5 SERVISFIRST BANK	9,685,929	14,969,908	64.70%
6 UMB BANK, NATIONAL ASSOCIATION	39,694,407	63,667,026	62.30%
7 CITY NATIONAL BANK	47,921,587	80,444,596	59.60%
8 STELLAR BANK	5,321,042	9,078,069	58.60%
9 WASHINGTON TRUST BANK	5,147,819	8,952,794	57.50%
10 BANCO POPULAR DE PUERTO RICO	31,114,000	54,452,000	57.10%

Source: FFIEC Call Reports

Banks highlighted in grey appear in the top-10 for the respective ratio on both dates; Color scales are based on the combined set of top 10 values from both dates for each ratio; SVB, First Republic, and Signature are highlighted in red.

Table 6

HTM securities as a share of total assets: 2022Q4 vs 2025Q4

Top-10 2022Q4			
Bank	HTM Securities (\$000s)	Total Assets (\$000s)	Ratio
1 CHARLES SCHWAB PREMIER BANK, SSB	19,355,000	31,498,000	61.40%
2 SILICON VALLEY BANK	91,327,000	209,026,000	43.70%
3 CHARLES SCHWAB TRUST BANK	5,689,000	13,041,000	43.60%
4 FARMERS AND MERCHANTS BANK OF LONG BEAC	4,789,522	12,054,744	39.70%
5 PROSPERITY BANK	14,019,503	37,695,970	37.20%
6 WASHINGTON TRUST BANK	3,221,994	10,412,724	30.90%
7 USAA FEDERAL SAVINGS BANK	32,867,000	110,900,000	29.60%
8 BANK OF HAWAII	5,401,623	23,579,258	22.90%
9 STIFEL BANK AND TRUST	4,275,675	21,228,609	20.10%
10 FIRST HAWAIIAN BANK	4,320,639	24,576,937	17.60%

Top-10 2025Q4			
Bank	HTM Securities (\$000s)	Total Assets (\$000s)	Ratio
1 CHARLES SCHWAB PREMIER BANK, SSB	14,648,000	27,022,000	54.20%
2 CHARLES SCHWAB TRUST BANK	5,261,309	10,434,593	50.40%
3 USAA FEDERAL SAVINGS BANK	34,186,000	107,989,000	31.70%
4 FARMERS AND MERCHANTS BANK OF LONG BEAC	3,266,493	11,797,060	27.70%
5 PROSPERITY BANK	10,275,228	38,458,815	26.70%
6 STIFEL BANK	2,857,039	11,735,326	24.30%
7 WASHINGTON TRUST BANK	2,195,115	10,682,990	20.50%
8 BANK OF HAWAII	4,245,681	24,142,511	17.60%
9 BMW BANK OF NORTH AMERICA	2,219,141	12,814,515	17.30%
10 STIFEL BANK AND TRUST	3,292,156	19,412,996	17.00%

Source: FFIEC Call Reports

Banks highlighted in grey appear in the top-10 for the respective ratio on both dates; Color scales are based on the combined set of top 10 values from both dates for each ratio; SVB, First Republic, and Signature are highlighted in red.

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Appendix 1 - Default Models and Ratings

To assess Silicon Valley Bank's default risk using market and accounting data, two complementary distance-to-distress measures were implemented.

The first is the Laeven-Levine Z score, reported at annual and quarterly frequency. It is an accounting-based solvency proxy that maps profitability, capitalization, and volatility into a single distance-to-distress type measure. The plots report the Z score over time with indicative risk bands to highlight whether the signal moves into elevated risk territory as the bank approaches failure.

The second is a structural Merton-KMV-style model. This produces a market implied distance to default and an implied one-year probability of default. The distance to default series captures how many standard deviations the firm sits above the default boundary under the model, while the implied probability of default converts that distance into an easier to interpret probability metric. The plots again report indicative risk bands to highlight changes in the signal in the run up to March 2023.

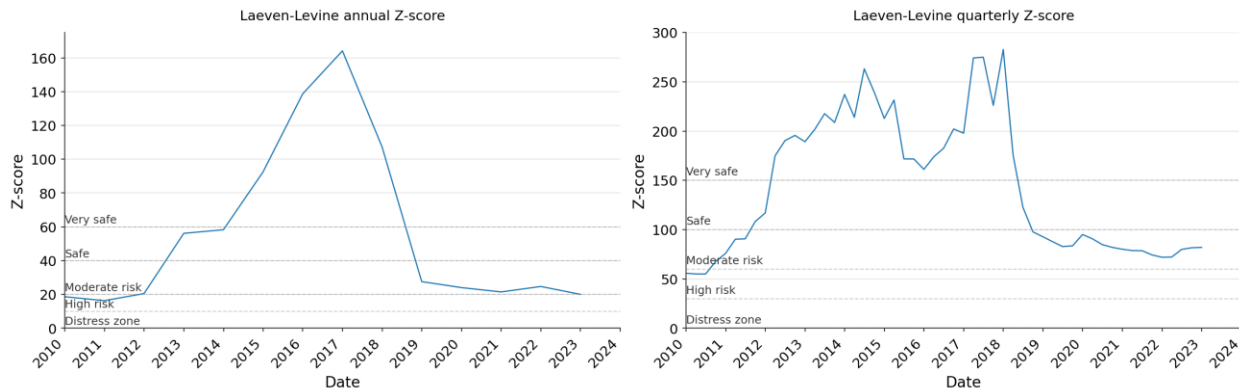


Figure A.1: Annual and quarterly Laeven-Levine Z-score for SVB

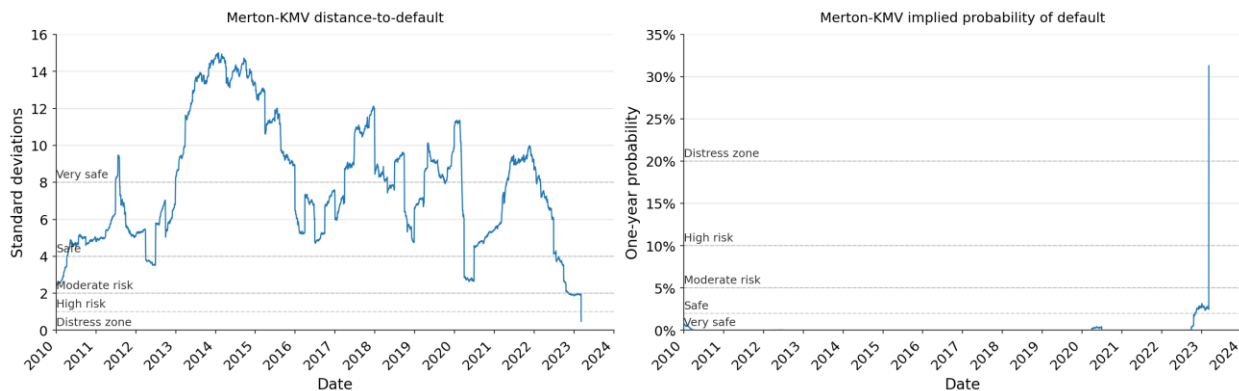


Figure A.2: Merton-KMV distance to default and probability of default for SVB

As the plots show, both models struggle to capture SVB's default risk. Their signals are largely anchored to reported accounting values, and as a result they do not pick up the underlying sources of vulnerability that SVB was exposed to.

The figure below reports SVB's credit ratings over time from Moody's, S&P, and the Bloomberg aggregate rating. As Figure A.3 shows, ratings remained essentially unchanged for most of the sample, staying in a narrow investment grade range with

only minor adjustments, providing little advance warning and showing no reassessment of default risk before March 2023.

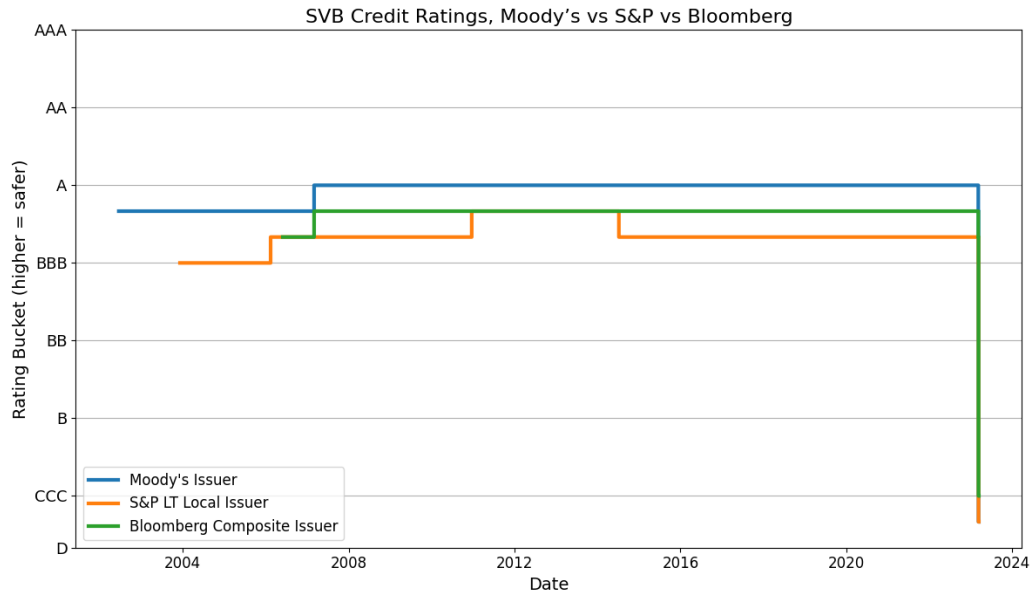


Figure A.3: SVB credit ratings, Moody's vs S&P vs Bloomberg Composite