The Effects of Collapsion of SVB on JP Morgan & Signature Bank's Stock

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Abstract:

This essay examines the ripple effects of Silicon Valley Bank's (SVB) collapse on major banks, focusing on JP Morgan and Signature Bank. Incorporating detailed insights about SVB, the study employs statistical and financial tools to analyze regression patterns between event and expectation windows. Graphical representations further elucidate the magnitude and implications of the collapse.

Keywords: SVB, JP Morgan, Signature Bank, collapse

1. Introduction

Established in 1983 in Santa Clara, California, Silicon Valley Bank (SVB) was the brainchild of Rogers Smith, Bill Biggerstaff, and Bob Medearis [1]. The bank's name, "Silicon Valley," derives from its location—a technology and innovation hub. Historically, many traditional banks shied away from investing in nascent technology enterprises due to their high-risk, high-reward profiles. Recognizing this gap, SVB's founders pioneered an investment approach anchored in venture capital (VC) private equity financing. This approach allowed them to cultivate a robust network of entrepreneurs who offered tailored solutions ranging from loans to specialized financial and cash management services. In a notable milestone, SVB's stock began trading on the NASDAQ in 1988—the world's first electronic stock exchange. Impressively, SVB weathered the tumultuous period of the late 1990s, known as the dot-com bubble—a speculative phase marked by an abrupt surge and subsequent plummet in the valuations of internet companies. In 2019, in the face of the COVID-19 pandemic, SVB demonstrated commendable resilience and adaptability, distinguishing itself from many contemporaries. However, the bank faced an unfortunate reversal of fortunes on March 10, 2023, when a confluence of factors led to its collapse [1].

2. Comparison

2.1 A comparison of the company positions of Silicon Valley Bank, JP Morgan Chase, and Signature Bank.

2.1.1 For SVB:

1. Target Audience: SVB serves technology and life sciences companies, from startups to established enterprises, venture capital, and private equity firms.

2. Banking Services: SVB offers various banking services, including business banking, commercial banking, treasury and cash management, foreign exchange, credit and lending solutions, and merchant services.

3. Customized Solutions: SVB understands the specific financial needs and challenges faced by innovative companies and tailors its solutions to help them manage cash flow, liquidity, and growth. This might involve providing lines of credit, term loans, and other financing options.

4. Venture Capital Relationships: SVB has deep connections with the venture capital community. It often provides banking services to VC firms and their portfolio companies, enabling seamless financial operations and fund management.

5. Innovation Ecosystem Support: SVB often provides insights, reports, and research on trends in the technology and life sciences sectors, helping clients stay informed about industry developments.

6. International Expansion: SVB strongly focuses on supporting companies looking to expand internationally by providing cross-border banking and financial services.

7. Risk Management: Due to its unique client base, SVB strongly emphasizes understanding the risks associated with emerging technology and life sciences companies and employs risk management strategies accordingly.

2.1.2 For JP Morgan:

1. Retail Banking and Consumer Services: JP Morgan operates a vast network of retail branches and offers a range of consumer banking services, including checking and savings accounts, credit cards, mortgages, personal loans, and wealth management,

2. Commercial Banking: JP Morgan provides banking services to small, medium, and large businesses. This includes cash management, payment processing, lending

solutions, and treasury services.

3. Investment Banking: JP Morgan is a prominent player in investment banking, offering services such as mergers and acquisitions advisory, capital raising, underwriting, and strategic financial solutions to corporations, institutions, and governments.

4. Asset Management: JP Morgan offers asset management services to institutional clients, including pension funds, sovereign wealth funds, endowments, and high-net-worth individuals. This involves managing investment portfolios, providing investment advice, and offering various investment products.

5. Private Banking and Wealth Management: JPMorgan provides specialized financial services to High-net-worth individuals and families. These services include investment management, estate planning, tax strategies, and customized financial planning.

6. Treasury and Securities Services: JPMorgan offers treasury services to corporations and institutions, including cash management, trade finance, securities custody, and fund administration.

7. Market Making and Trading: JPMorgan engages in market-making activities in various asset classes, including equities, fixed income, currencies, and commodities. The firm also operates a proprietary trading desk.

2.1.3 For Signature Bank:

1. Specialized Client Focus: Signature Bank targets privately owned businesses, middle-market companions, real estate developers, Investors, and high-net-worth individuals as its

2. primary client base.

3. Commercial Banking: The bank offers a range of commercial banking services, including business checking and savings accounts, treasury and cash management services, business loans, lines of credit, and commercial real estate financing,

4. Real Estate Financing: Signature Bank has a significant presence in commercial real estate lending, providing financing solutions for development, construction, and investment projects.

5. Private Banking and Wealth Management: Signature Bank provides personalized wealth management services to high-net-worth individuals and families. This includes investment management, financial planning, estate planning, and trust services.

6. Customized Solutions: The bank is known for its commitment to offering customized financial solutions to meet the unique needs of its clients. This personalized approach sets Signature Bank apart from larger, more traditional banks.

7. Technology and Innovation: Signature Bank has embraced technological innovation to enhance its customer experience and streamline operations. It has developed its own

8. proprietary digital platform to facilitate banking services.

9. Relationship-Based Approach: Signature Bank emphasizes building solid, long-lasting client relationships. The bank's teams work closely with clients to understand their financial goals and tailor solutions accordingly.

10. Community Involvement: Signature Bank is actively involved in the communities it serves and supports various philanthropic initiatives and local organizations.

11. Risk Management: Like any financial institution, risk management is critical to Signature Bank's operations. The bank employs risk assessment and mitigation strategies to ensure the safety and soundness of its activities.

2.2 These are the consumer bases of three institutions

Here is their business mode of them. Firstly, SVB works with a wide range of technology companies, including startups, emerging growth companies, and established tech firms. These can span various sub-sectors such as software, hardware, internet, artificial intelligence, biotechnology, clean tech, etc. Also, SVB serves businesses in the life sciences industry, which includes biotechnology, pharmaceuticals, medical devices, diagnostics, and other healthcare-related sectors. These companies often require specialized financial solutions due to the unique nature of their operations and funding requirements. Moreover, SVB strongly focuses on startups and entrepreneurs at various stages of growth. The bank offers customized banking solutions and financial services to help startups manage their finances, cash flow, and growth trajectory.

Beyond companies, SVB serves critical players within the innovation ecosystem, including accelerators, incubators, tech transfer offices at universities, and other entities that support entrepreneurship and innovation. Last but not least, SVB offers personalized banking and wealth management services to high-net-worth individuals and families associated with the technology and life sciences sectors.

JP Morgan provides small and medium-sized businesses with banking solutions, credit products, and cash management services. Also, JPMorgan offers financial services to large corporations, including treasury and cash management services, corporate lending, trade finance, and risk management. In addition, JP Morgan

provides wealth management services to high-net-worth individuals, families, and ultra-high-net-worth clients. These services include investment management, estate planning, tax strategies, and financial planning. The bank also offers financial services to governments, municipalities, and public entities, including treasury services, municipal finance, and public sector solutions [2]. Signature Bank serves a wide range of businesses, including privately owned companies, middle-market firms, and corporations. These businesses may come from various industries, and the bank provides them with commercial banking services, such as business checking and savings accounts, cash management solutions, lending, and treasury services. Also, Signature Bank has a significant presence in serving real estate developers, investors, and professionals. This includes financing for real estate projects, construction loans, property acquisitions, and other real estate-related financial services.

Moreover, the bank offers personalized private banking and wealth management services to high-net-worth individuals and families. These services encompass investment management, financial planning, estate planning, and trust services.

It also serves Not-for-Profit Organizations. The bank serves nonprofit organizations, foundations, and charitable entities, providing specialized banking services to support their financial operations and missions. Ultimately, Signature Bank engages with entrepreneurs and startups, offering customized banking solutions and financial support to help them grow and succeed.

Lastly, the main distribution areas of these institutions SVB, SVB's headquarters are in Santa Clara, California, in the heart of Silicon Valley. This region is a global center for technology and innovation, and SVB has a significant presence here, serving numerous startups, tech companies, and venture capital firms. In addition to its headquarters, SVB has a strong presence in San Francisco and other cities within the Bay Area. San Francisco is another major hub for technology and finance.SVB has branches and offices in various cities across California, including Los Angeles, Irvine, and Santa Monica. In addition, SVB also has a presence in other major U.S. cities with vibrant technology and innovation ecosystems, such as New York City, Boston, Seattle, and Austin.

For JP Morgan JP Morgan has a significant presence across the United States, with headquarters in New York City; the bank operates recall branches, commercial banking centers, and corporate offices in various cities and states throughout the country,

Also, JPMorgan has a strong presence in major European financial centers, including London (United Kingdom), Frankfurt (Germany), Paris (France), and other cities; these locations serve as hubs for investment banking, asset management, and other financial services. The bank has a substantial presence in the Asia-Pacific region, with offices in cities such as Tokyo (Japan), Hong Kong, Singapore, Mumbai (India), Sydney (Australia), and others. JPMorgan provides a range of financial services to clients in the region, including corporate and investment banking.

JP Morgan operates in various Latin American countries, including Brazil, Mexico, and Argentina. The bank services corporations, institutions, and high-net-worth individuals in these markets.

Signature Bank is headquartered in New York City and is concentrated in this financial hub. The bank has multiple branches and offices throughout different neighborhoods in the city. Signature Bank's reach extends beyond New York City to other parts of the greater metropolitan area, including Long Island, Westchester County, and northern New Jersey. Signature Bank has expanded its presence to the state of Florida, where it serves businesses and individuals through various locations, including Miami and Fort Lauderdale. The bank has established a presence in California, primarily focusing on serving the needs of technology companies and entrepreneurs in the state's innovation.

3. The Analysis of SVB

3.1 How SVB Makes Profit

SVB, based in Silicon Valley, helps businesses grow and makes money in several important ways.

One way they earn money is by lending it to businesses. When you borrow money from a friend and promise to pay them back with a little extra, SVB lends money to businesses and charges them extra money, called interest. Imagine a tech startup that needs money to hire more people or create new products. SVB lends them the money, and when the startup pays it back, SVB makes extra money from the interest. Like regular banks, this interest is a big part of SVB's profit.

SVB also offers special financial services that are customized for businesses. These services help businesses manage their money better. They might help handle daily financial tasks, provide loans, or assist with financial planning. For example, if a medical research company is working on important projects, SVB helps them manage their money effectively. In return, SVB charges fees for these specialized services, which adds to their earnings.

In today's world, many businesses work with partners and customers from other countries. SVB helps these businesses by dealing with money from different

countries. Let us say a tech company in Silicon Valley sells its products to European customers. SVB helps them exchange the money from US dollars to euros, ensuring they get a fair deal. SVB makes money from the fees they charge for these currency services.

However, SVB is not just a regular bank; they are deeply connected to the world of startups, especially in technology. They often invest money in startups when they are just getting started. This is like helping a small plant grow into a big tree. For example, SVB might give money to a new company working on exciting technology like artificial intelligence. If that company becomes successful and grows, SVB benefits from more financial activity, and the startup's value goes up. This shows how SVB supports innovation and also makes money by investing wisely.

In conclusion, SVB makes money by lending to businesses, offering special financial services, handling international money transactions, and investing in startups. They are committed to helping these businesses succeed while providing crucial financial support. SVB's dedication to innovation and partnership keeps them relevant and profitable in today's financial world.

3.2 How SVB Collapse

1. Origin: Quantitative easing by the Federal Reserve led to rapid expansion of assets for Silicon Valley Bank.

During the pandemic, the Federal Reserve initiated a quantitative easing policy, injecting substantial liquidity into the market. The US PE/VC market also expanded quickly, providing Silicon Valley Bank with a significant influx of low-interest deposits, resulting in the bank's rapid asset growth.

2. Turning Point: A swift shift in monetary policy leads to increased operational pressures for the bank.

As 2022 began, the liquidity feast in the PE/VC market ended, causing substantial operational pressures for Silicon Valley Bank. Amid the Federal Reserve's aggressive interest rate hikes, the bank faced elevated costs on its liability side.

3. Warning: Venture capital firms indicate risks, and Silicon Valley Bank executives cash out.

In light of the rising operational risks faced by SVB, venture capital firm Greenoaks Capital Partners alerted startup founders about potential issues with the bank.

4. Default: Silicon Valley Bank announces a large-scale refinancing plan.

On March 8, 2023, SVB announced the sale of a portion of its bonds and a large-scale refinancing, triggering liquidity concerns.

5. Bank Run: A stock price crash triggers a bank run.

On March 9, 2023, SVB's stock price crashed by 60%, causing a significant decline in the US banking sector. The strategic updates exacerbated fund withdrawal concerns. Various institutions like Founder Collective, Activant Capital, and USV advised companies to withdraw funds from SVB before funds were depleted. Prominent venture capital funds with influence in Silicon Valley, like Peter Thiel's Founders Fund, also recommended divesting from the bank. Consequently, Silicon Valley Bank faced a liquidity crisis, with its stock price plummeting 60% – the most significant drop since 1998 – causing a market capitalization loss of $9.4 billion.

6. Bankruptcy: SVB faces bankruptcy and credit rating downgrade.

On March 10, 2023, the California Department of Financial Protection and Innovation (DFPI) announced the closure of Silicon Valley Bank and appointed the Federal Deposit Insurance Corporation (FDIC) as the bankruptcy administrator.

3.3 Why SVB Collapse

Policy Side: The Trigger and Main Causes of the Silicon Valley Bank Incident

To respond to the global pandemic-induced economic downturn, the Federal Reserve embarked on an unprecedented period of loose monetary policy, slashing the benchmark interest rate from 1.25% to 0.25%. Simultaneously, the United States witnessed a surge in inflation, soaring from 1.5% in March 2020 to 7.9% in February 2022, marking a staggering increase of 243.48%. Under the persistent pressure of soaring inflation, on March 16, 2022, the Federal Reserve urgently shifted its monetary policy to tightening mode, implementing a series of 8 consecutive interest rate hikes. By March 12, 2023, the Federal Reserve had cumulatively increased rates by 450 basis points, constituting the fastest rate-hiking process in 40 years. The escalating interest rates cut off opportunities for cheap funding, laying bare the economy's vulnerability.

Silicon Valley Bank's Liabilities: Escalating Run Pressure and Low Fraction of Stable Deposits

During 2020-2021, a frenzy of initial public offerings (IPOs) fueled by venture capital flooded the market, resulting in a substantial accumulation of funds by technology startups deposited in Silicon Valley Bank. By 2021, the total deposits at Silicon Valley Bank had reached $189.203 billion, marking an increase of $87.221 billion from 2020, translating to an 85.53% growth rate. The proportion of deposits to liabilities at Silicon Valley Bank progressively increased, reaching as high as 97.18% in 2021. Since 2022, the radical change in the interest rate environment led to a significant decline in the startup financing ratio. According to PitchBook Data,

as of December 12, 2022, venture capital investment in US startups had dropped by about one-third compared to 2021. However, startup expenses did not decrease; Silicon Valley Bank indicated customer "burn rates" had tripled before 2021. In 2022, the total annual deposits at Silicon Valley Bank decreased by $16.094 billion, roughly accounting for 10% of total deposits. Silicon Valley Bank had a relatively low proportion of stable deposits. According to FDIC data, stable deposits comprised about 11% of Silicon Valley Bank's total deposits. Due to this low fraction of stable deposits, market panic intensified the withdrawal of depositor funds. As soon as depositors perceived potential risks with Silicon Valley Bank, they rapidly pulled out their deposits, escalating the risk of a bank run. Notably, the loss of low-interest deposits was even more pronounced within the deposit outflows from Silicon Valley Bank. In 2022, the total annual deposits decreased by $16.094 billion, approximately 10% of the total deposits. Among these, non-interest-bearing demand deposits plummeted from $125.851 billion to $80.753 billion, constituting a substantial 35.83% decline.

Asset Side: Aggressive Allocation to Long-Term Assets and Substantial Losses on Fixed-Rate Bonds

The asset structure of Silicon Valley Bank transformed, with a significant increase in the proportion of securities investments. Firstly, Silicon Valley Bank allocated considerable funds to US Treasury bonds and Mortgage-Backed Securities (MBS). Between 2018 and 2021, the proportion of securities investments increased from 40.89% to 59.30%. Notably, the investment scale in Held-to-Maturity (HTM) securities surged from $16.592 billion in 2020 to $98.195 billion in 2021, representing an astronomical growth rate of 491.82% [3]. This caused their proportion in total assets to rise from 14.36% to 46.43%. Secondly, in contrast to the surge in MBS investments, Silicon Valley Bank's cash and cash equivalents experienced a decline. In 2020, these accounted for $17.675 billion, representing 15.30% of total assets. However, this ratio dropped to 6.91% in 2021 and 6.52% in 2022. This reduced their capacity to manage liquidity crises. Silicon Valley Bank incurred substantial unrealized losses with the sharp fall in US Treasury bond prices and the deposit run. As US bond prices plummeted, the value of the US Treasury bonds and MBS assets held by Silicon Valley Bank faced significant depreciation. By the end of 2022, the unrealized losses from MBS and US Treasury bond investments reached $9.349 billion and $2.503 billion, respectively. Typically, as long as securities are not sold and the bank patiently awaits a decline in interest rates, no actual losses would be realized. However, due to the depositor run on the liabilities side, Silicon Valley Bank was forced to sell securities at discounted prices to secure cash, thus transforming unrealized losses into actual ones.
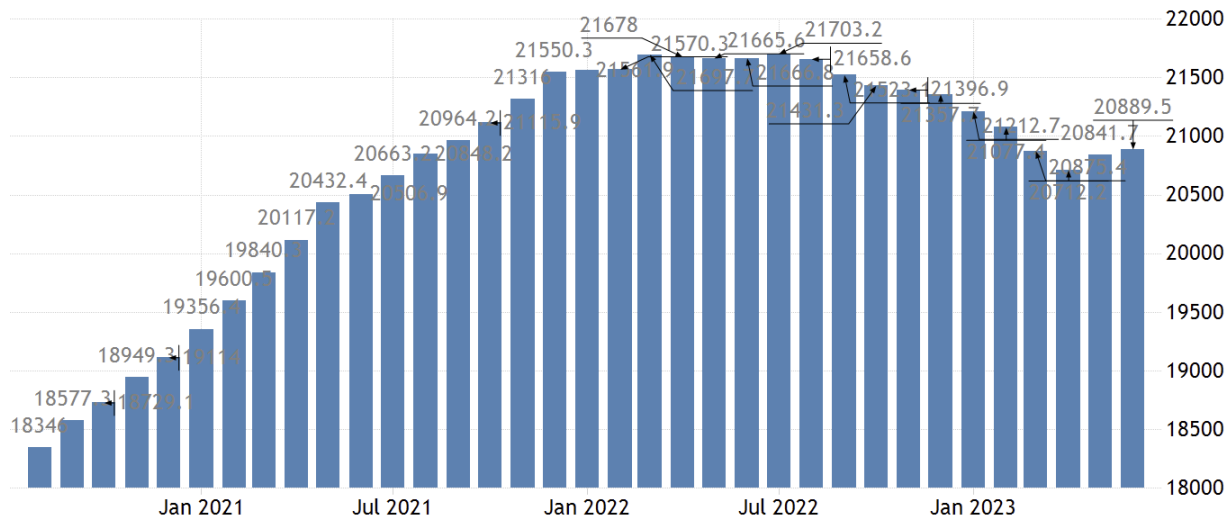
Figure 1: United States Money Supply M2

Figure 2: The stock price of SVB and others

Figure 3: US 4 Week Bill Yield(US interest)

3.4 The Impact of The Fail of SVB:

Firstly, The "Domino Effect" Continues Unfolding. The "Silicon Valley Bank" incident is not an isolated case. Silvergate Bank and Signature Bank have recently announced their bankruptcies, and over ten small and medium-sized community banks in the United States are considered more susceptible to similar risks. Additionally, digital trading platform OKX posted on social media that the Federal Deposit Insurance Corporation has intervened with First Republic Bank, where fund telegraphic transfers have been suspended. The chain reaction stemming from Silicon Valley Bank's bankruptcy is still unfolding. On March 22, the Federal Reserve announced another interest rate hike of 25 basis points, raising the federal funds rate target range to 4.75% and 5%, the highest level since October 2007. Under the backdrop of the Federal Reserve's interest rate hikes and balance sheet reduction, the Fed may pay closer attention to the liquidity issues of small and medium-sized banks to prevent similar risks from occurring again. The impact of the "Silicon Valley Bank" incident on the US technology and innovation industry should not be underestimated. Although Silicon Valley Bank's total scale is far from being a systematically important bank, due to its high industry concentration of deposits, its impact on the tech industry might be more pronounced. Some tech companies could face severe cash flow challenges in the short term, and bankruptcy risks cannot be ruled out [4].

Secondly, Transmission of Financial Risks Across Borders for Commercial Banks. In addition to high inflation in the United States, Europe is also facing significant economic recession and inflation pressures. The European Central Bank has raised its benchmark interest rate by 300 basis points to 3% since June 2022, and the momentum for further interest rate hikes continues, leading to persistent increases in sovereign bond yields for countries like Germany and France. European and American banks hold substantial amounts of sovereign bonds from each other, and the rising yields have led to increased losses on bond assets, enlarging the risk exposure of the banking sector's overseas bond positions. This situation might result in overall risks in the asset-liability structure of European banks. It could potentially lead multinational commercial banks into bankruptcy waves, following in the footsteps of "Silicon Valley Bank." On March 16, Credit Suisse, a European bank of significant systemic importance, experienced a crisis. On March 19, with the support of the Swiss government, the Swiss National Bank, and the Swiss Financial Market Supervisory Authority, Credit Suisse Group announced the acquisition of Swiss Credit

Bank for a total of CHF 3 billion. This demonstrates the transnational transmission of risks for European and American commercial banks, which might intensify global financial risk pressure and impact the Federal Reserve's interest rate hike plans and pace [5,6].

4. The Analysis of JP Morgan's Stock

Initially, 2022 was designated as the estimation window, preceding the event window to facilitate a comprehensive examination of the stock's "normal" return. This strategic decision enabled the construction of a foundational model based on the Linear Regression equation $y = \alpha + \beta x + \varepsilon$. In this formulation, represents the return at a given juncture, capturing the percentage variation in the asset's valuation from one timeframe to the next. On the other hand, x represents the return on the market index during the specific interval, reflecting the aggregate market's percentage fluctuation over the defined duration. For this analysis, the S&P 500 was adopted as the representative benchmark for the broader market. To calculate the return, the difference between the current day's closing price and the preceding day's closing price is taken, and the result is divided by the latter. Once all the returns from JP Morgan and the S&P 500 have been calculated, the coefficients of the regressions can be determined.

In the regression statistic in a linear regression function, Multiple R stands for the correlation between the observed and predicted values of the dependent variable. In this situation, it is about 0.713, which indicates a moderately strong positive relationship between the observed values (Rmt) and the values predicted by the model using Rt. R square represents the proportion of the variance in the dependent variable that's predictable from the independent variable(s). In this case, with a value of about 0.5089, it means that approximately 50.89% of the variability in the dependent variable can be explained by the model, while the rest is due to other factors not included in the model. Adjusted R modified version of R-squared that adjusts for the number of predictors in a model, with a value of 0.50689, it indicates that after adjusting for the number of predictors, approximately 50.69% of the variability in the dependent variable is explained by the model, offering a more precise measure of fit when considering multiple predictors. The standard error is a measure of the amount of variability in the estimates of a regression coefficient, with a value of 0.01327, it suggests that the estimates of the regression coefficients are expected to vary by approximately 0.01327 units from sample to sample, assuming the model's assumptions are met, additionally, the standard error can also use to calculate the confidence interval, which provides a range of values, derived from

the data, within which the actual parameter value is likely to fall with a certain level of confidence. This small value indicates a relatively low level of uncertainty in the coefficient estimates. Finally, we have 250 observations of both the returns of the market and the individual stock, which is JP Morgan in 2022.

ANOVA, which stands for variance, is a statistical method used to analyze the differences among group means. In the context of Regression, ANOVA is used to determine the overall fit of a linear model. Specifically, it tests the hypothesis that the model's predictors do not affect the dependent variable, which tests the regression model's overall significance. In regression analysis, "df" means "degrees of freedom." The degrees of freedom associated with different components of the regression model help understand the number of independent pieces of information involved in the calculations; in this case, it is "1", meaning there is only one independent predictor in the regression model. In other words, you are working with a simple linear regression, where a single independent variable is being used to predict the dependent variable.

The "df of Residual" (often denoted as refers to the degrees of freedom associated with the residuals (or errors) of the model. In this table, 248 independent pieces of information are used to estimate the variability of the residuals. This value is crucial for various statistical tests and calculating measures like the Mean Square Error. In the context of regression analysis and the ANOVA (Analysis of Variance) table associated with it, "df Total" stands for the total degrees of freedom, which is the number of the data set minus one, which refers to the number of independent pieces of information available to estimate parameters or test hypotheses. The SSR represents the regression sum of squares, which represents the portion of the total variability that the regression model explains. In this case, the total variation in the dependent variable accounted for by the regression model (i.e., by the predictors or independent variables) is about 0.162. The SSE stands for "SS of the residual," which quantifies the unexplained variability in the dependent variable by the regression model. If the SSE is about 0.143, the total squared difference between the observed values and those predicted by the regression model is 0.143. This value provides an aggregate measure of the model's "miss" or the variability in the dependent variable that the model does not capture. The smaller the SSE, the better the model fits the data. SST stands for the Total Sum of Squares. It represents the total variability in the dependent variable without considering the effect of the independent variables. The value of SST provides a baseline against which you can compare the amount of

variability explained by the model(SSR) and the amount of variability that remains unexplained(SSE). The MS of Regression means that the independent variables explain the average variability in the dependent variable. MS of Regression is 0.162, indicating that, on average, the model explains a squared variation of 0.162 in the dependent variable. The MS of the Residual is the average amount of variability in the dependent variable that remains unexplained by the model. 0.0005 This minimal value suggests that the unexplained variability in the dependent variable, on average, is extremely low. This could indicate

a good fit of the model to the data, but it is essential to consider other metrics and the analysis context. The F statistic tests the null hypothesis that all regression coefficients are equal to zero versus the alternative that at least one is not zero. For F, 280.703 is a relatively large value, suggesting that the variability explained by the model is significantly greater than the unexplained variability. The "Significance F" or simply the p-value associated with the F is relatively small, representing very strong evidence against the null hypothesis.

Regression Statistics								
Multiple F	0.713354							
R Square	0.508875							
Adjusted I	0.506894							
Standard	0.013271							
Observati	250							
ANOVA								
	df	SS	MS	F	gnificance F			
Regression	1	0.045258	0.045258	256.9626	3.61E-40			
Residual	248	0.04368	0.000176					
Total	249	0.088938						
	Coefficient	andard Err	t Stat	P-value	Lower 95%	Upper 95%	ower 95.0%	pper 95.0%
Intercept	0.000113	0.00084	0.134756	0.892914	-0.00154	0.001769	-0.00154	0.001769
X Variabl	0.883956	0.055144	16.03005	3.61E-40	0.775347	0.992566	0.775347	0.992566

Figure 4: The regression analysis and the ANOVA

In our analysis conducted using Microsoft Excel, we determined the intercept to be 0.000113, denoted as α, and 0.88396 for the X variable, representing β Upon integrating these values into the linear regression model $y = \alpha + \beta x + \varepsilon$, we computed the abnormal return. This metric delineates the discrepancy between a stock's actual and anticipated returns, considering the prevailing market performance and other pertinent factors, specifically during the event of SVB's collapse. In the accompanying diagram, the abnormal return is denoted as AR. The time frame for our analysis spanned from March 1 to March 27. Accounting for weekends, this period comprises 17 sets of daily return data. Subsequently, we derived the cumulative abnormal return (CAR) by aggregating the individual abnormal returns, as depicted in

the diagram. Upon obtaining the CAR, we established the confidence interval for the stock, a range within which we posit the true value resides. This interval was computed using the formula 1.96 multiplied by the standard error multiplied by the square root of the abnormal return. This yielded the upper bound of the confidence interval, with the same formula (but with a negative multiplier) providing the lower bound. In our table, this is represented as CI. The coefficient 1.96 was employed because it signifies the number of standard deviations from the mean encompassing 95% of the data in a standard normal distribution.

The value six on the x-axis corresponds to March 9, the day preceding the failure. On this date, SVB's stock experienced a precipitous decline, negatively impacting

JP Morgan's return. Nonetheless, JP Morgan exhibited a swift recovery, with its return rebounding on March 10. After this recovery, the trajectory of the graph declined, potentially attributable to external factors. Notably, JP Morgan's public website, within the technology innovation section, announced a new investment in technology. Corporate developments or governmental pronouncements might have influenced this downturn.
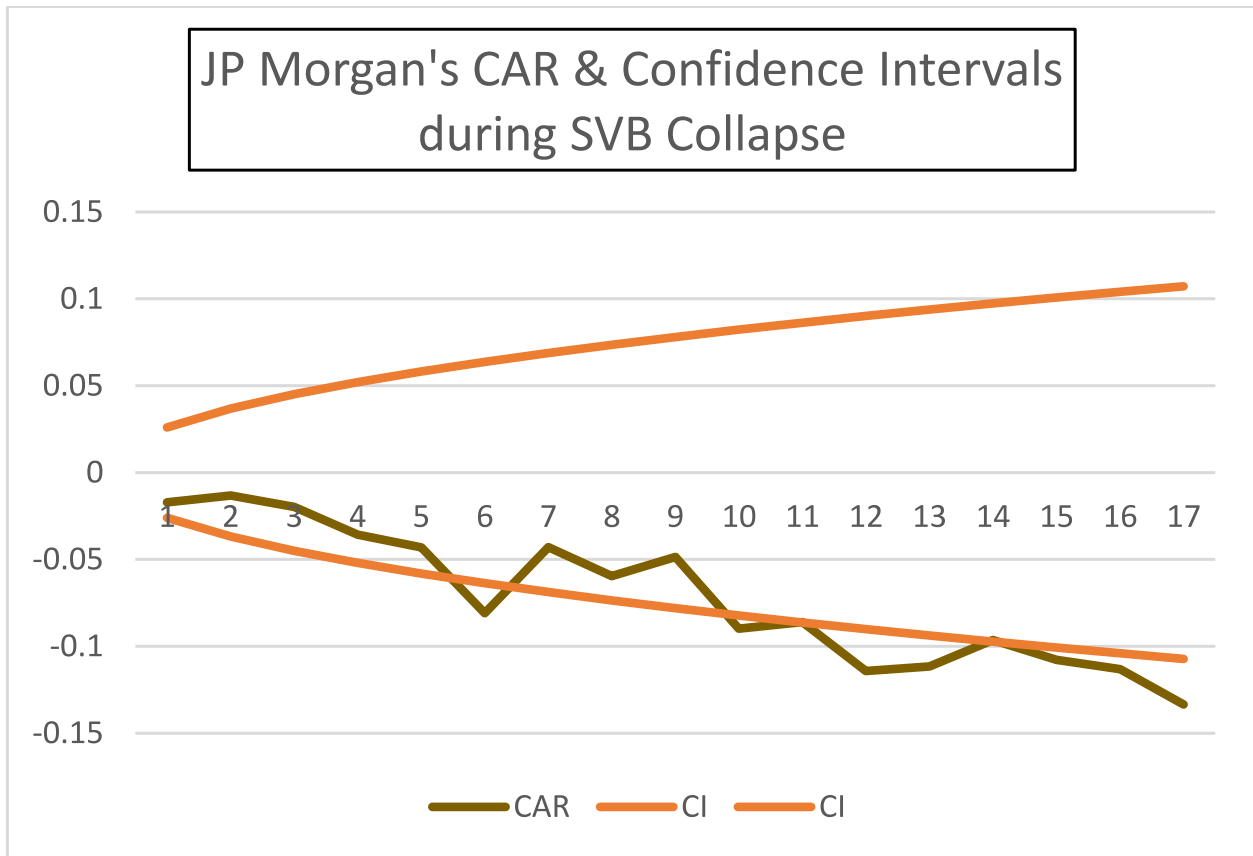

Figure 5: JP Morgan's CAR & Confidence Intervals during SVB Collapse

5. Analysis of Signature Bank's Stock

Multiple R (0.729): This value, also known as the correlation coefficient, suggests a moderately strong linear relationship between the independent and dependent variables. A value closer to 1 would indicate a stronger positive linear relationship.

R Square (0.531): Often termed the coefficient of determination, this metric indicates that approximately 53.1% of the variance in the dependent variable is explained by the model. In practical terms, the predictors in the model can account for over half of the variability in our outcome.

Adjusted R Square (0.529): This version of R Square adjusts for the number of predictors in the model. Its value being close to the R Square suggests that the model efficiently uses its predictors.

Standard error (0.024): This measures the average amount by which the observed values deviate from the regression line. A smaller value indicates a better fit of the regression line to the data.

Observations (250): This denotes the total number of data points or samples used in the regression analysis.

Df of Regression (1) indicates one independent variable in the regression model.

SS of Regression (0.162): This value represents the sum of squares due to Regression, indicating the variability explained by the model.

MS of Regression (0.162): This is the mean square of the Regression, representing the average variability explained by the model.

F of Regression (280.703): This large F-statistic suggests that the model is statistically significant and fits the data better than a model with no predictors.

Significance F of Regression (1.19e-42): This extremely small p-value indicates strong evidence against the null hypothesis, suggesting that the model is statistically significant.

Df of Residual (248): This represents the degrees of freedom associated with the residuals or error.

SS of Residual (0.14): This value denotes the sum of squares of the residuals, indicating the variability not explained by the model.

MS of Residual (0.000577): This is the mean square of the residuals, representing the average unexplained variability.

Coefficient of Intercept (-0.00226): This value represents the expected value of the dependent variable when all independent variables are zero. The negative value suggests a decrease in the dependent variable for the baseline case.

Standard Error of the Intercept (0.001521): This quantifies the variability in the estimated intercept.

X Variable (1.672): This coefficient indicates that for every one-unit increase in the X variable, the dependent variable is expected to increase by 1.672 units, holding all else constant.

Standard Error of X Variable (0.099779): This measures the variability or uncertainty in the estimated coefficient of the X variable.

Regression Statistics					
Multiple F	0.728648				
R Square	0.530927				
Adjusted F	0.529036				
Standard	0.024014				
Observati	250				

ANOVA					
	df	SS	MS	F	gnificance F
Regression	1	0.161868	0.161868	280.7028	1.19E-42
Residual	248	0.14301	0.000577		
Total	249	0.304878			

	Coefficien	undard Er	t Stat	P-value	Lower 95%	Upper 95%	ower 95.0	pper 95.0%
Intercept	-0.00226	0.001521	-1.48383	0.139124	-0.00525	0.000739	-0.00525	0.000739
X Variabl	1.671711	0.099779	16.75419	1.19E-42	1.47519	1.868233	1.47519	1.868233

Figure 6: Signature Bank's CAR and confidence intervals during the SVB crisis,

Figure 6 shows Signature Bank's CAR and confidence intervals during the SVB crisis, and it is clear that Signature Bank faced some severe challenges. On March 9, when SVB started having problems, Signature Bank's financial health took a hit, and it did not bounce back quickly as JP Morgan did. Instead, it kept going down in the days after the SVB crisis. This is a worrisome sign because it suggests that Signature Bank had difficulty handling the situation and keeping enough money in reserve to stay safe. While things like market trends and government announcements might have worsened things, the fact that Signature Bank did not recover quickly is a big concern. It is essential to figure out why JP Morgan bounced back while Signature Bank struggled during this challenging time.
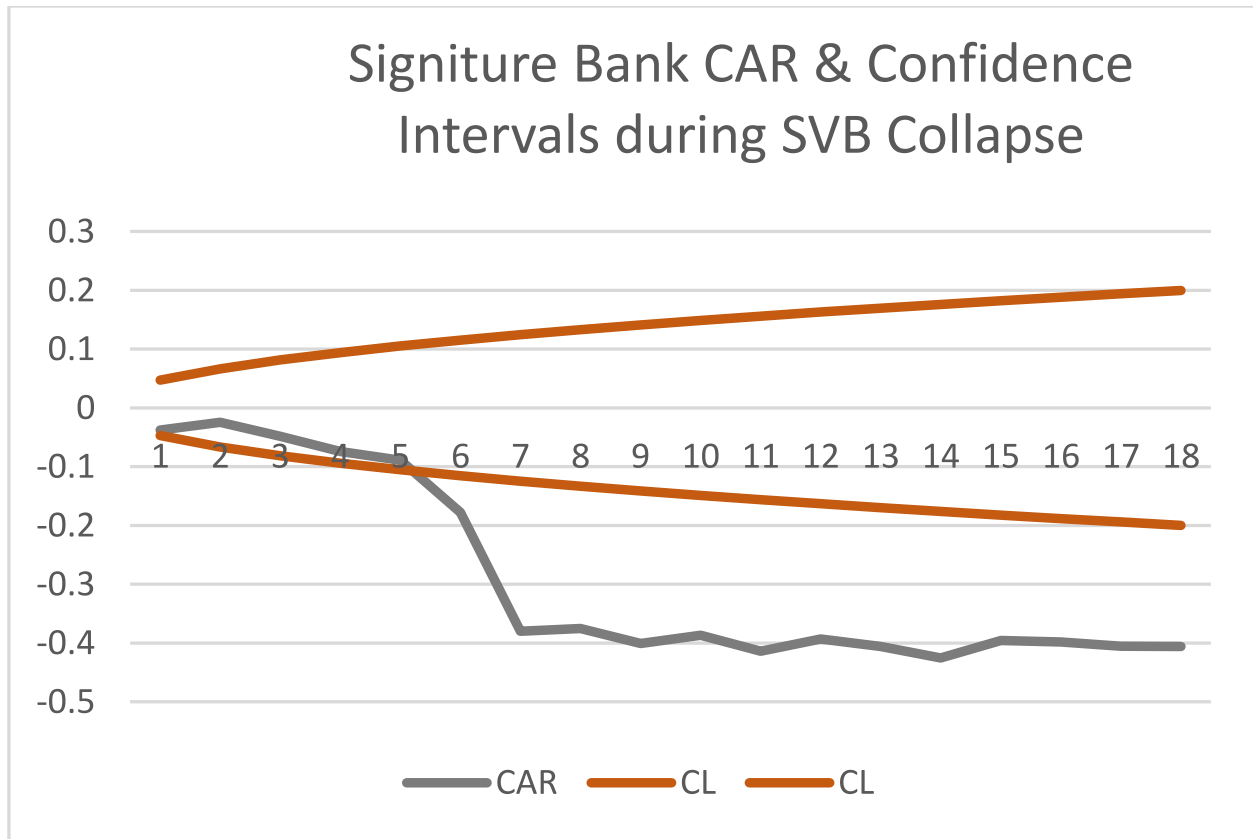
Figure 7: Signature Bank CAR & Confidence Intervals during SVB Collapse

6. Conclusion

In conclusion, our analysis of Signature Bank and JP Morgan during the SVB crisis reveals contrasting performances. Signature Bank faced significant challenges and struggled to recover quickly, while JP Morgan exhibited a more resilient response. Signature Bank's financial health declined and did not bounce back slower than JP Morgan's, raising concerns about its ability to handle such situations. On the other hand, JP Morgan recovered swiftly after an initial decline. External factors like corporate developments or government announcements influenced JP Morgan's decline. The computation of abnormal returns and cumulative abnormal returns provides insights into the deviation of actual returns from expected returns during the crisis. Further investigation is needed to understand the reasons for these differences and identify strategies to enhance resilience in challenging times for banking institutions.

Reference

[1] Chen Weidong, Xiong Qiyue. Concentration and Financial Stability: International Experience and Implications for China's Banking Industry (J). International Financial Research, 2021 (6)
[2] Yu Yongding. The Reasons, Evaluation, and Implications of the Shift in Monetary Policy by the Federal Reserve [J]. International Finance, 2023 (3)
[3] Cátia A. Sousa, Helena M.V.M. Soares, Eduardo V. Soares. "Toxic effects of nickel oxide (NiO) nanoparticles on the freshwater alga Pseudokirchneriella subcapitata", Aquatic Toxicology, 2018.
[3] Xiong Qiyue. The Impact and Lessons from the Collapse of Silicon Valley Bank in the United States [J]. International Finance, 2023 (4)
[4] Ma Wei. The Closure of Silicon Valley Bank in the United States Sparks Global Financial Risk Concerns [J]. Economic Outlook, 2023 (7)
[5] Xia Hongtao. Regulatory Lessons and Implications from the Collapse of Silicon Valley Bank [J]. Qinghai Finance, 2023 (7)