Asia-Pacific Stock Market Reactions To Silicon Valley Bank's Bankruptcy

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Abstract

Silicon Valley Bank (SVB), a technology-oriented lender headquartered in California, declared bankruptcy on 10 March 2023, which created a worldwide stock market reaction. This study examines the impact of Silicon Valley Bank's bankruptcy news on stock markets in the Asia Pacific area. The research uses an event study methodology to evaluate market responses over five days before and after the bankruptcy announcement. Seven stock indexes, including Japan, Hong Kong, China, South Korea, Australia, Taiwan, and India, were analyzed in terms of their abnormal returns, average abnormal returns, and cumulative abnormal returns. The normality testing has verified that the data follows a normal distribution, confirming the appropriateness of the use of the paired sample t-test to test the hypothesis of whether there is a difference in abnormal returns, average abnormal returns, and cumulative abnormal returns. The findings show evidence of no statistically significant alterations in abnormal returns, average abnormal returns, or cumulative abnormal returns before and after the announcement. This situation suggests that the bankruptcy of Silicon Valley Bank had a negligible influence on stock markets in the Asia Pacific area.

Keywords: *Abnormal Return, Average Abnormal Return, Cumulative Abnormal Return, Event Study*

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1. INTRODUCTION

In early March 2023, Silicon Valley Bank (SVB), a technology-oriented lender headquartered in California, experienced bankruptcy. This event was the worst bank collapse in the United States since the financial crisis of 2008–2009. Silicon Valley Bank (SVB) is positioned as the 16th largest commercial bank among the top 20 in the United States. Based on data provided by the Federal Deposit Insurance Corporation (FDIC), SVB now holds around USD 209 billion in total assets and USD 175 billion in total deposits as of December 2022. The speed at which SVB deteriorated was so fast that regulatory intervention was required within 48 hours to stop the spread. The fall transpired as consumers commenced the withdrawal of their deposits, and SVB was incapable of fulfilling their payment requests.

In 2021, SVB implemented a financial plan to achieve high investment returns by shifting its portfolio investments and securities from short-term to long-term government bonds. In 2022, the Federal Reserve Bank implemented interest rate increases to counteract the rising inflation. Consequently, the value of government bonds declined between 2022 and 2023, leading to significant losses for SVB's portfolio that the bank could not recoup. Investors tend to become more cautious when the expense of borrowed funds increases due to increasing interest rates. Furthermore, this adversely affected technology start-up enterprises, which happen to be SVB's primary clientele, significantly reducing SVB's liquidity [32]. According to FDIC records, SVB on March 8, 2023, the Financial Group (SVBFG) declared its intention to reorganize its balance sheet by selling USD 21 billion worth of available-for-sale (AFS) securities. This sale will result in a loss of USD 1.8 billion after taxes. In addition, SVBFG intends to generate $2.25 billion through an equity

issue. Depositors interpreted these actions as an indication of financial challenges within SVBFG. Consequently, the California Department of Financial Protection and Innovation (CDFPI) closed SVB on March 9–10, 2023, leading to a significant decrease of over 3% in the S&P 500 index of the US market.

On March 13, 2023, the Asia-Pacific market experienced several drops when SVB's bankruptcy was announced, impacting markets in India, China, Hong Kong, Japan, South Korea, and Australia [2]. At the start of trading, Japan's Nikkei 225 index had a dip of 2.59%. Similarly, the Hang Seng index in Hong Kong and the Shanghai Composite index in China sank by 0.06%. Australia's ASX 200 index dropped by 0.99%, while South Korea's KOSPI index declined by 0.74% [7]. Shanghai Pudong Development Bank Co in China conducts banking transactions with SVB, while Andon Health Co has invested about 5% of its monetary and financial assets there. Brii Biosciences in Hong Kong has less than 9% of its total cash reserves stored at SVB. Broncus Holding Corp maintains approximately US$11.8 million (equivalent to 6.5% of its cash holdings) with the bank. BeiGene Ltd. has uninsured cash deposits that account for 3.9% of its overall cash reserves. Zai Lab Ltd. is exposed to SVB through 2.3% of its US$1,008.5 million cash reserves. SoftBank Group Corp, the parent company of SoftBank Vision Fund, has funds deposited with SVB in Japan. Sumitomo Mitsui Trust Holdings Inc. holds a 0.29% ownership interest in the bank, while Korea National Pension Service from South Korea

has a 0.17% share. In India, 40 businesses have made deposits at SVB, ranging from $250,000 to over $1 million. Out of these, over 20 start-ups have deposits surpassing $1 million. Xero Ltd. holds around US$5 million in cash at SVB, whereas SiteMinder Ltd. has US$6.66 million in cash holdings at the same bank [12][20].

Multiple studies have examined the influence of economic events or external information on companies. Bankruptcy study has been extensively studied in previous works [33], [18]. A survey by [23] examined bankruptcy filings and the reorganization process in Poland. The researchers utilized event analysis methodologies and conducted numerous statistical tests to evaluate the outcomes. The results indicate that stock prices respond promptly to public information. Additional studies by [24] and [25] examined political events and regional conflicts. The studies conducted by researchers [30], [37], and [8] analyzed the influence of a ruling by the constitutional court on the litigation over the 2019 presidential election. Their findings indicate that there was no substantial variation in the average abnormal returns before and after the occurrence of this event. Inspired by these discoveries, researchers intend to examine the composite stock price index throughout the Asia-Pacific area, specifically in India, China, Taiwan, Hong Kong, South Korea, Japan, and Australia, about the SVB bankruptcy news.

2. METHODOLOGY

This study uses an event study methodology to examine hypotheses by examining quantitative data through calculations. The analysis depends on secondary data sources, specifically the daily closing prices and currency exchange rates for each country, collected throughout a five-day period, including the news of SVB's bankruptcy on 10 March 2023. The observation period spans from five days before the announcement (3–9 March 2023) to five days after it (13–17 March 2023). Seven composite stock indices that match the sampling requirements were chosen from six developed countries (Japan, Hong Kong, China, South Korea, Australia, Taiwan) and one developing country (India). The study employs three metrics, which include Abnormal Return (AR), Average Abnormal Return (AAR), and Cumulative Abnormal Return (CAR). The Abnormal Return is calculated daily by subtracting the expected return from the observed return using the method presented below [16]:

$$AR_{it} = R_{it} - E(R_{it})$$

(1)

while the Average abnormal return formula is:

$$\text{AAR}_{it} = \frac{1}{N} \sum_{i=1}^{N} AR_{it}$$

(2)

and the Cumulative abnormal return formula is

$$\text{CAR}_{it} = \sum_{i=1}^{N} AR_{it}$$

(3)

This study uses the Wilcoxon signed-rank test to evaluate hypotheses, assuming a normal data distribution. If the data does not follow a normal distribution, the paired-sample t-test will be used instead, with 1%, 5%, and 10% significance levels.

3. RESULT & DISCUSSION

This study applies descriptive statistics to detail the data concerning the research variables, comprising AR, AAR, and CAR, observed both prior to and following the SVB bankruptcy announcement.

Table 1. Descriptive Statistics of Abnormal Return

Period	Minimum	Maximum	Mean	Std. Deviation
AR Before-5	-0,0104	0,0115	-0,0014	0,0070
AR Before-4	-0,0123	0,0065	-0,0017	0,0067

AR Before-3	-0,0119	0,0077	-0,0024	0,0086
AR Before-2	-0,0154	0,0119	0,0022	0,0093
AR Before-1	-0,0131	0,0143	-0,0032	0,0089
AR After+1	-0,0242	0,0233	0,0064	0,0159
AR After+2	-0,0086	0,0191	0,0056	0,0106
AR After+3	-0,021	0,0051	-0,0082	0,0085
	-0,0068	0,0173	,0038	0,0082
AR After-				
AR After-	-0,0146	0,0094	),0036	0,0075

Source: Processed data (2023)

It is important to analyze the SVB bankruptcy notice to obtain a comprehensive understanding of the abnormal return figures. AR is determined by subtracting the daily expected return from the actual return for the observation period. Table 1 displays the statistical data findings on the complete sample's AR values before and after the SVB bankruptcy announcement. The data shows a decline in the AAR following the announcement of the SVB bankruptcy, with a value of -0.01053.

Table 2. Descriptive Statistics of AAR and CAR

Period	Minimum	Maximum	Mean	Std. Deviation
AAR-Before	-0,0059	0,0078	-0,0013	0,0047
AAR-After	-0,0004	0,003	0,0013	0,0015
CAR-Before	-0,0297	0,0388	-0,0064	0,0234
CAR-After	-0,0213	0,0149	0,0041	0,0127

Source: Processed data (2023)

The statistical data on the AAR of the total sample before and after the SVB bankruptcy declaration are presented in Table 2. The data indicates a decrease in the mean abnormal return from -0.00259 before the announcement to afterward. Additionally, Table
2 displays the CAR values for the entire sample before and after the SVB bankruptcy announcement, indicating a decrease from -0.01054 before the announcement to after.

Table 3. Abnormal Return

Index	(t-5)	(t-4)	(t-3)	(t-2)	(t-1)	(t0)	(t+1)	(t+2)	(t+3)	(t+4)	(t+5)
NIKKEI	0,011	0,003	0,002	0,008	0,014	0,004	-0,002	-0,006	-0,003	0,000	0,009
KOSPI	0,003	0,004	-0,010	-0,004	-0,013	0,006	0,023	-0,009	-0,003	0,017	-0,015
SENSEX	-0,010	0,007	0,008	0,012	-0,010	0,001	-0,024	0,019	-0,021	0,013	-0,008
SSEC	-0,003	-0,012	-0,012	0,009	-0,001	0,005	0,017	0,012	-0,009	0,000	-0,007
HIS	-0,003	-0,005	0,001	-0,015	-0,006	-0,018	0,016	0,000	0,005	-0,007	0,001
AXJO	-0,001	-0,007	-0,012	0,000	0,000	-0,012	0,004	0,013	-0,012	0,001	-0,003
TSEC	-0,006	-0,001	0,007	0,005	-0,006	-0,004	0,011	0,010	-0,014	0,001	-0,003

Source: Processed data (2023)

This study employs the Shapiro-Wilk test to assess the normality of the data. The results of the normality test on the AR variable, with a significance level of 5% (0.05), are presented in Table 5 while for AAR and CAR, they are presented in Table 6.

Table 4. CAR and AAR

Index	5 AAR	7 AAR	5 CAR	7 CAR
NIKKEI 225	0,0078	-0,0002	0,0388	-0,0010
KOSPI	-0,0040	0,0028	-0,0201	0,0142
SENSEX	0,0012	-0,0043	0,0058	-0,0213
SSEC	-0,0040	0,0026	-0,0200	0,0131
HIS	-0,0059	0,0030	-0,0297	0,0149
AXJO	-0,0038	0,0005	-0,0189	0,0026
TSEC	-0,0002	0,0012	-0,0011	0,0061

Source: Processed data (2023)

Table 5. Normality Test Results in Abnormal Return

Period	N	Sig.	Decision
AR Before-5	7	0,718	No Difference
AR Before-4	7	0,718	No Difference
AR Before-3	7	0,125	No Difference
AR Before-2	7	0,365	No Difference
AR Before-1	7	0,347	No Difference
AR After+1	7	0,328	No Difference
AR After+2	7	0,387	No Difference

AR After+3	7	0,95	No Difference
AR After+4	7	0,21	No Difference
AR After+5	7	0,9	No Difference

Source: Processed data (2023)

Table 6. Normality Test Results AAR and CAR

Period	N	Sig.	Decision
AAR Before	7	0,15	No Difference
AAR After	7	0,112	No Difference
CAR Before	7	0,15	No Difference
CAR After	7	0,1	No Difference

Source: Processed data (2023)

Based on the results of the normality tests, each AAR and CAR variable exhibits different significance levels. The normality test results for AAR data before and after the SVB bankruptcy announcement indicate significance values higher than 5%. Similarly, the normality test results for CAR data before and after the SVB bankruptcy announcement also show significance values higher than 5%. This indicates that the AAR and CAR data follow a normal distribution before and after the event. Therefore, the hypothesis test in this study will be conducted using the Paired Sample t-test.

Based on the prior data normality tests, it is clear that the AR, AAR, and CAR data follow a normal distribution. Consequently, the hypothesis test for this study will be performed using a parametric test, namely the Paired Sample t-test. The results of the Paired Sample t-test for the AR variable are presented in Table 7.

Table 7. Hypothesis Test Results from Abnormal Return

Periode	Sig.	Decision
AR Before 5 - AR After 1	0,231	No Difference
AR Before 4 - AR After 2	0,211	No Difference
AR Before 3 - AR After 3	0,296	No Difference
AR Before 2 - AR After 4	0,690	No Difference
AR Before 1 - AR After 5	0,795	No Difference

Source: Processed data (2023)

Table 8. Hypothesis Test Results in AAR and CAR

Periode	Sig.	Decision
AAR Before - AAR After	0,287	No Difference
CAR Before - CAR After	0,423	No Difference

Source: Processed data (2023)

The results of the hypothesis test on AR conducted before and after the SVB bankruptcy announcement are presented in Table 7. The table shows that the abnormal returns continuously exceeded 0.05 throughout the observation period. This result indicates no significant difference in AR between the periods before and after the announcement. Similarly, Table 8 displays the results of the Paired Sample T-Test for AAR, and CAR, which also show values over 0.05. This highlights the finding that there were no substantial changes in these returns during the periods following the announcement of the SVB bankruptcy.

Table 3.8 provides more evidence that the AAR and CAR values showed no change when the SVB bankruptcy announcement was made. This study uses event study methods to clarify the influence of the SVB bankruptcy declaration on the reactions of financial markets in the Asia-Pacific region. The study examines fluctuations in AR, AAR, and CAR among composite stock indices in the area. It compares the periods before and after the announcement. The hypotheses were assessed using a parametric paired sample T-test, which is appropriate for examining the announcement's impact on market performance, assuming that the data follows a normal distribution.

The evaluation of the abnormal return (AR) variable reveals that the Paired Sample t-test findings indicate no significant difference in abnormal return before and after the SVB bankruptcy notification. All anomalous return values are greater than 0.05. The abnormal return values are as follows: 0.231 at t-5 and t+5, 0.211 at t-4 and t+4, 0.296 at t-3 and t+3, 0.690 at t-2 and t+2, and 0.795 at t-1 and t+1. This implies that the null hypothesis H01 is accepted, while the alternative hypothesis Ha1 is rejected. This suggests no statistically significant difference in anomalous return between the periods before and after the SVB bankruptcy news event.

Practically, the descriptive static table informs that the abnormal return at t+1 has the lowest value of -0.0242 and the highest value of 0.0233, and the smallest mean value at t+3 is -0.0082. However, the mean result is higher than the standard deviation, indicating no data deviation in the abnormal return variable. Phenomenally, while the findings of this study suggest that abnormal return does not significantly impact the stock market in the Asia-Pacific region, the AR value at t-1 is notably more negative. This is because many investors and companies make large withdrawals in t-1 due to panic when they find out about bankruptcy.

The findings of this study align with the research results from [38], [25], and [1], which show no significant (negative) abnormal return differences in the period before and after the event. A study by [36] showed significant results with only one insignificant index in the SVB bankruptcy event. The difference in the results of this study is due to the number of samples and the use of country samples (developed and

developing countries). Research by [36] used the world's top 10 and composite indices. This study uses seven composite indices in the Asia-Pacific region, and the country has companies supported by SVB, with differences in the number and region of the sample making a difference.

The findings of the paired sample t-test showed no statistically significant difference in the AAR before and after the announcement of the SVB bankruptcy. This is because the average abnormal return value of 0.287 was more than 0.05. Therefore, the null hypothesis is supported, and the alternative hypothesis that there is a difference in AAR before and after the SVB bankruptcy announcement is rejected, suggesting that there were no substantial changes in AAR during the SVB bankruptcy announcement.

Practically, the descriptive statistics table indicates that the pre-event AAR has the lowest value of -0.0059 compared to the post-event AAR, with the smallest mean value in the pre-event AAR being -0.0013. However, the mean result is smaller than the standard deviation, indicating data deviation in the average abnormal return variable. Phenomenally, even though the findings of this study suggest that the average abnormal return has no substantial impact on the Asian-Pacific region's stock market, the AAR value before the event on all indices experienced negative values except the Nikkei index. After the event, only Nikkei and Sensex experienced negative AAR values. This is because the announcement of the federal deposit corporation guarantees the deposits of depositors, so there was panic at the beginning of the news of the SVB bankruptcy announcement.

The findings of this study are consistent with research conducted by [8], [30], and [21], which similarly found no significant difference in AAR before and after the SVB bankruptcy announcement. However, the study by [24] reported substantial results in AAR, a discrepancy attributed to differences in the events and subjects analyzed. Specifically, while [36] examined the IDX index in the context of the Russian-Ukrainian war, this study focuses on a composite index in the Asia-Pacific region, covering countries with companies that are either clients of or receive assistance from SVB—this variation in focus accounts for the differing results across these studies.

The paired sample t-test results showed no statistically significant difference in CAR before and after the SVB bankruptcy announcement, as indicated by a cumulative abnormal return value of 0.423, which surpasses the 0.05 threshold. As a result, the analysis leads to the acceptance of H03 and the rejection of Ha3, suggesting that there is no notable disparity in cumulative abnormal returns between the periods preceding and following the declaration of the SVB bankruptcy.

Essentially, the descriptive statistics table shows that the CAR before the event has the lowest value of -0.0297 compared to the CAR after, with the smallest mean value being
-0.0064 for the CAR before. Nevertheless, the average outcome is less than the standard deviation, suggesting cumulative abnormal return variable variability. Surprisingly, the findings of this study suggest that abnormal returns have no substantial impact on stock markets in the Asia-Pacific region. However, the CAR

value before the event is negative for all indices, save for the Nikkei and Sensex indices. Following the event, only the Nikkei and Sensex exhibited a decline in value. This is due to the announcement made by the Federal Deposit Corporation, which ensures the safety of depositors' funds.

The results of this study align with research conducted by [36] and [10] Additionally, the study discovered no notable disparity in CAR before and after the declaration of the SVB bankruptcy. In contrast, the study by [38] reported mixed results: insignificant differences before the announcement but significant differences afterward. This discrepancy arises because [38] focused on the U.S. market sector, where SVB is headquartered, while this study examines composite indices in the Asia-Pacific region. The regional differences between these studies may account for the variation in cumulative abnormal returns observed.

4. CONCLUSION

This study seeks to evaluate the impact of the bankruptcy announcement of Silicon Valley Bank (SVB) by examining whether there are notable fluctuations in AR, AAR, and CAR across the consolidated stock indices in the Asia-Pacific region. The data reveal multiple critical consequences. The preliminary research, conducted using the paired sample t-test on abnormal returns, indicates that there is no statistically significant distinction between the periods preceding and following the announcement of the SVB bankruptcy. The t-test analysis of AAR indicates that there is no statistically significant disparity in the AAR between the periods preceding and following the announcement. Furthermore, the CAR hypothesis test reveals that there is no statistically significant divergence in CAR throughout these periods. To summarize, the absence of significant variations in AR, AAR, and CAR indicates that the SVB bankruptcy announcement had minimal impact on the composite stock indices in the Asia-Pacific region.

The implications of these findings suggest that the bankruptcy news of SVB had a negligible effect on the stock markets in the Asia-Pacific region. This implies that the markets in this area may have been able to withstand the financial difficulties faced by SVB as a significant U.S. bank, or that other reasons helped reduce the possible consequences.

5. SUGGESTIONS

After analyzing the results, discussion, and implications of the research, numerous suggestions can be made for capital market professionals. They are encouraged to evaluate current developments and assess their potential influence on investment yields. This approach can aid investors in making well-founded choices. Furthermore, scholars and prospective researchers may explore various research avenues, such as investigating worldwide occurrences and their repercussions on individual nations. Furthermore, alternative calculation models may provide different insights, as different models can yield varied results.

It is worth noting that this study has limitations. It only includes 7 out of 19

composite stock indices in the Asia-Pacific region. This is because only seven composite stock indices are included in MSCI ACAP and represent countries with companies supported by Silicon Valley banks.

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