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The domino effect: Analyzing the impact of Silicon Valley Bank's fall on top equity indices around the world

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ABSTRACT

This study used event study methodology to analyze the impact of Silicon Valley Bank (SVB) fall on the top nine global equity indices from 6 September 2022 to 22 March 2023. The steep sell-off of equities due to the bank run on March 10, 2023, was the major reason behind this movement. The study suggests that the failure of a major financial institution like SVB can have a significant impact on the global equity markets, with contagion effects spreading across borders.

1. Introduction

Silicon Valley Bank (SVB) was a leading financial institution that catered to the banking needs of tech startups and venture debt in the US. With over 50% of all US venture-backed companies and numerous VC firms as clients, it provided banking services to emerging tech companies such as Cisco Systems and Bay Networks. SVB built close relationships with its clients, creating a sense of togetherness in the close-knit tech industry, and connecting limited partners (LPs) and general partners (GPs) with startups. SVB was renowned for its venture lending practice, which included around $74 billion worth of loans, including venture debt. SVB is the largest US bank to fail since the 2008 financial crisis. The bank's collapse was due to its exposure to risky start-ups and the panic created among investors and depositors following its announcement of a fundraising plan to plug gaps in its balance sheet. The sudden collapse of SVB has stranded billions of dollars belonging to companies, investors, and depositors, creating a bloodbath in the startup industry and banking stocks. This crisis has highlighted the risks associated with investing in the fast-paced world of tech start-ups, and the potential for the tightening of credit for the entire industry, which could stifle innovation and entrepreneurship. Its collapse has caused global market

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reverberations, with bank shares in the US, Europe, and Asia plunging, and investors rushing into safe-haven assets amid bets on less aggressive tightening from the US Federal Reserve. HSBC bought the UK arm of SVB for a symbolic one pound, rescuing a key lender for technology startups in England. The SVB shock could have a chilling effect on the British biotech sector as 40% of UK's biotech companies were banking with SVB's British arm, and Chinese startups and fund managers are looking to move their money out of SVB once they can. Although in a study conducted by Moudud-Ul-Huq et al. (2022), a significant and positive correlation was found between market power and financial stability of banks in the Middle East and North African (MENA) countries. The failure of a major financial institution like SVB can have significant consequences for the stability and resilience of the financial system and can lead to contagion effects spreading across borders which forms our motivation to analyze the impact of the fall of SVB on the global equity markets. Having said that, we propose to use event study method based on the efficient market hypothesis (EMH) (Fama, 1960), which suggests that financial markets are efficient and incorporate all available public information into asset prices. Event studies operate under the assumption that the market reacts quickly and logically to new information and that the effects of an event on a stock's price are entirely reflected in its price immediately following the event. The event study technique, established over half a century ago, is widely embraced by finance researchers and practitioners alike. It serves to analyze the influence of various events on stock prices, including macroeconomic shocks, corporate initiatives, and regulatory alterations. In recent times, event studies have been employed extensively to gage the repercussions of significant global occurrences, such as the COVID-19 (Alabbad and Schertler, 2022; Chai et al., 2022; Pandey and Kumari, 2021; Yarovaya et al., 2021, 2022), and the ongoing Russia-Ukraine war (Boubaker et al., 2022; Martins et al., 2023; Mohamad, 2022; Yousaf et al., 2022)

Martin et al. (2007) found that a firm's inclusion in the FTSE4Good UK Index did not yield notable financial returns. Kumari et al. (2023) analyzed 25 EU stock market indices and determined that market responses differed based on stock market efficiency and geographical proximity to the war zone. Studies also explored the contagin effect of firms on other firms such as, the Volkswagen scandal (Bouzzine and Lueg, 2020), collapse of FTX (Yousaf et al., 2023), the ransomware attack on colonial pipeline (Corbet and Goodell, 2022; Goodell and Corbet, 2023). Aktar et al. (2021) found that firms with low leverage and high cash holdings exhibit greater responsiveness to monetary policy shocks, which explains their varied investment activities.

MacKinlay (1997) posited that an event study gauges the impact of a specific event on a company's value. For event study, the event period must first be determined. Nevertheless, the event period typically extends beyond the announcement day, encompassing the surrounding timeframe. The estimation period, a separate time window, is utilized to examine all the parameters necessary to estimate normal returns. Distinguishing between the estimation and event windows is crucial for accurately measuring normal returns, prompting researchers to often use a window preceding the event to estimate the parameters, referred to as the pre-event period. In this study, 120 trading days are employed for the window estimation period from t-128 (September 6, 2022) to t-9 (February 27, 2023), while the event window ranges from t-8 (February 28, 2023) to $t + 8$ (March 22, 2023).

The study endeavours to address the research question: How did the fall of SVB affect the NASDAQ Composite (United States), Nikkei 225 (Japan), HangSeng (Hong Kong), SSE Composite Index (China), FTSE 100 (United Kingdom), Euronet 100 (Europe - pan-European), NIFTY (India), TSX60 (Canada), and SZSE 100 (China) using daily data from September 6, 2022, to March 22, 2023?

To the best of the authors' knowledge, this is the first study to analyze the impact of fall of SVB on top world equity indices using an event study methodology. Furthermore, our study differs from previous research in this area in several ways. While previous studies have focused on the impact of specific events on individual stocks or industries, our study examines the impact of a major financial institution's fall on top equity indices worldwide. We also analyze the impact of the SVB collapse on both pre-event and post-event periods and assess the contagion effect on top stock exchanges. Additionally, we employ a larger window estimation period (120 trading days) than most studies in this area. The contributions of our study lie in its ability to provide a comprehensive understanding of the impact of the SVB collapse on the global equity markets, including the contagion effect on select stock exchanges. Our findings could inform policymakers and investors on the potential risks associated with investing in the fast-paced world of tech startups and the tightening of credit for the entire industry, which could stifle innovation and entrepreneurship. Moreover, our study could assist investors in making informed investment decisions and provide valuable insights into risk management in the financial sector.

Our hypothesis for the study is as follows:

Null Hypothesis (H0): The fall of Silicon Valley Bank had no significant impact on the top equity indices worldwide.

Alternative Hypothesis (Ha): The fall of Silicon Valley Bank had a significant impact on the top equity indices worldwide.

2. Data and methodology

This paper uses adjusted daily observations of top ten equity exchanges containing NASDAQ composite index, Nikkei 225, Hang Seng, SSE composite index, FTSE 100, Euronext 100, NIFTY, TSX 60 and SZSE 100. We collect daily data using Bloomberg spanning from September 6, 2022, to March 22, 2023, and employ event study methodology. The same test was employed by (Mackinlay, 1997; Warner and Brown, 1983; Chen et al., 2007; Liu et al., 2020; Irfan et al., 2022). Upon a deeper dive of understanding, March 10, 2023, is considered as event date since SVB was collapsed on that day due to the second largest bank run (withdrawal of deposits) in the history. Further, 120 trading days are used for window estimation period from t-128 (September 6, 2022) to t-9 (February 27, 2023) whereas event window ranges from t-8 (February 28, 2023) to $t + 8$ (March 22, 2023). For empirical computation, this study uses mean return of window estimation for the computation of expected/normal return considering from -128 to -9 period and abnormal return is derived subtracting the expected return from log return of respective stock exchange (G.R. Irfan et al., 2022). Mathematically, abnormal return is expressed as below:

$$AR = R_t - E(R) \tag{1}$$

Where, AR is abnormal return, R_t denotes daily log return of select stock exchanges over the period of time and E(R) is an expected return.

Next, the significance of abnormal return (AR) is calculated dividing the standard error (SE) of window estimation from abnormal return respective day. It is expressed as follows:

$$t - statistics\ of\ AR = AR/SE \tag{2}$$

where, SE = σARt/Root under n

Finally, after computing the abnormal return and its t-statistics, cumulative abnormal return (CAR) is calculated using:

$$\mathrm{CAR} = \sum_{t=0}^{T} ARt \tag{3}$$

3. Empirical result

In this section, we examine the impact of the SVB collapse on the top nine indices by market capitalization. Table 1 presents the abnormal return and t-statistics of select indices on the event day, with each equity exchange realizing a negative abnormal return but with varying significance levels across different stock exchanges. On the event day, technology workers and venture capital-backed companies withdrew massive funds, leading to a contagion effect on the select stock exchanges. The Hang Seng exchange suffered the most significant negative abnormal return (3.05%), indicating the largest impact on this stock exchange. Surprisingly, the abnormal return of SZSE 100 was not significant, indicating a minimal impact of the SVB bank run on the Chinese stock exchange (SZSE 100). These results suggest that investors contemplating investing in the Hang Seng index responded severely and negatively to this news.

Next, Table 2 presents the cumulative abnormal return (CAR) of select exchanges during the event window spanning from t-8 to $t+8$. Referring to the table, we observe that news prior to the SVB deposit withdrawal (pre-event) influenced stock exchanges from t-8 to t-1, although few equity indices were not significantly affected during some pre-event windows. For a more detailed analysis, we observe that NASDAQ and Nikkei were not significant in t-8, Euronext 100 in t-6, SZSE 100 in t-5, NASDAQ in t-4, Hang Seng in t-4 and t-3, SSE and SSE, FTSE 100, Euronext 100, NIFTY, TSX 60, and SZSE 100 in t-2, and FTSE 100 along with Euronext 100 in t-1. Referring to the post-event window ($t+1-t+8$), the abnormal return of FTSE 100, Euronext 100, NIFTY, and TSX 60 was negative and significant in $t+1$, indicating that the stock market belonging to the UK, Europe, India, and Canada suffered strongly from day 1 post-collapse. The investors and other stakeholders of the stock exchange responded negatively to the news. Despite the bailout package announced by the US government to the depositors, the market did not cheer; it continued to fall. Notably, NASDAQ, Nikkei, Hang Seng, SSE, and SZSE 100 stock exchanges responded positively to the news in $t+1$. Furthermore, the news contagion was mixed amongst select markets since the abnormal return was both positive and negative over the $t+1-t+8$ period. Notably, the abnormal return was observed positive and significant in the long run. For example, $t+7$ was spotted with a positive and significant return followed by $t+8$, except NASDAQ.

In summary, the pre-event period was more panic inducing to the market than the post-event period comparatively since the market corrected post-event. In a similar study, Pandey et al. (2023) found that the collapse of SVB had a significant impact on global markets, with negative returns observed from the event day to $t+4$ in developed markets, while emerging markets were less affected. The impact on different regions and countries varied.

4. Conclusion and policy implication

This study is an attempt to unravel the impact of Silicon Valley Bank run on select equity market employing mean adjusted event study methodology. The result unfolds that each market realized negative return on event. Similarly, on the event day, each stock exchange is spotted with negative and significant abnormal return except Chinese stock market (SZSE 100) since market swings wildly and Hang Seng realized highest negative abnormal return. At the end, cumulative abnormal return (CAR) indicates that pre-event is panic for the market since investors and stakeholders of the market reacted the market negatively than post event period since

Table 1
Abnormal return and its t-statistics on event day.

Index	Country	Abnormal return	T-test
NASDAQ Composite Index	USA	−0.0179	−10.68
Nikkei 225	Japan	−0.0083	−6.61
Hang Seng	Hong Kong	−0.0305	−16.19
SSE Composite Index	China	−0.0053	−5.07
FTSE 100	United Kingdom	−0.0093	−7.65
Euronext 100	Europe	−0.0071	−5.31
NIFTY	India	−0.0108	−13.92
TSX 60	Canada	−0.0156	−12.02
SZSE 100	China	−0.0018	−1.31

This table presents the abnormal return and its t-statistics on the event day for nine different indices from selected countries.

Table 2
Cumulative abnormal return (CAR) of select stock exchanges.

Day	NASDAQ	Nikkei	Hang-Seng	SSE	FTSE 100	Euronext 100`	NIFTY	TSX 60	SZSE 100
t-8	−0.0012	0.0007	−0.0086***	0.0082***	−0.0120***	−0.0087***	−0.0025**	−0.0081***	0.0079***
	(−0.72)	(0.60)	(−4.55)	(7.80)	(−9.86)	(−6.49)	(−3.28)	(−6.23)	(5.59)
t-7	−0.0069	0.0028	0.0412	0.0197	0.0047	0.0028	−0.0065	0.0046	0.0230
	(−4.09)***	(2.26)*	(21.88)***	(18.77)***	(3.88)***	(2.07)*	(−8.41)***	(3.52)***	(16.40)***
t-6	0.0071***	−0.0051***	−0.0093***	−0.0072***	−0.0049***	−0.0001	0.0096***	0.0043***	−0.0128***
	(4.20)	(−4.01)	(−4.92)	(−6.84)	(−4.03)	(−0.10)	(12.33)	(3.35)	(−9.09)
t-5	0.0193***	0.0220***	0.0068***	0.0065***	0.0076***	0.0098***	−0.0079***	0.0120***	0.0022
	(11.46)	(17.47)	(3.61)	(6.18)	(6.21)	(7.35)	(−10.16)	(9.20)	(1.60)
t-4	−0.0014	0.0106***	0.0017	−0.0054***	−0.0049***	0.0044***	0.0223***	−0.0043***	−0.0048***
	(−0.81)	(8.45)	(0.89)	(−5.14)	(−3.98)	(3.26)	(28.80)	(−3.31)	(−3.43)
t-3	−0.0128***	−0.0065***	−0.0034	−0.0156***	−0.0186***	−0.0215***	0.0036***	−0.0227***	−0.0237***
	(−7.58)	(−5.15)	(−1.79)	(14.81)	(−15.30)	(−16.08)	(4.65)	(−17.42)	(−16.87)
t-2	0.0037*	0.0032**	−0.0238***	0.0011	0.0015	−0.0020	−0.0007	−0.0002	−0.0023
	(2.21)	(2.60)	(12.64)	(1.03)	(1.23)	(−1.48)	(−0.93)	(−015)	(−1.65)
t-1	−0.0210***	0.0150***	−0.0062***	−0.0040***	−0.0004	−0.0004	−0.0116***	−0.0147***	−0.0029*
	(−12.46)	(11.91)	(3.31)	(−3.82)	(−0.33)	(−0.32)	(−14.97)	(11.27)	(−2.09)
$t+1$	0.0042*	0.0022	0.0196***	0.0203***	−0.0146***	−0.0193***	−0.0197***	−0.0027*	0.0139***
	(2.52)	(1.81)	(10.39)	(19.29)	(11.95)	(−14.43)	(−25.46)	(−2.11)	(9.90)
$t+2$	0.0209***	−0.0300***	−0.0235***	−0.0104***	0.0087***	0.0149***	−0.0081***	0.0070***	−0.0101***
	(12.44)	(−23.77)	(−12.48)	(−9.87)	(7.13)	(11.10)	(−10.38)	(5.39)	(−7.20)
$t+3$	0.0003	0.0063***	0.0149***	0.0000	−0.0478***	−0.0492***	−0.0133***	−0.0210***	−0.0074***
	(0.17)	(5.05)	(7.90)	(−0.0020)	(−39.26)	(−36.78)	(−17.16)	(−16.15)	(−5.26)
$t+4$	0.0242***	−0.0105***	−0.0174***	−0.0097***	0.0113***	0.0182***	0.0025**	0.0114***	−0.0137***
	(14.40)	(−8.31)	(9.21)	(−9.19)	(9.25)	(13.60)	(3.21)	(8.76)	(−9.78)
$t+5$	−0.0077***	0.0264***	0.0163***	0.0091***	−0.0056***	−0.0062***	0.0065***	−0.0093***	0.0042**
	(−4.55)	(20.95)	(8.65)	(8.62)	(−4.60)	(−4.59)	(8.36)	(−7.17)	(2.99)
$t+6$	0.0036*	−0.0107***	−0.0259***	−0.0036***	0.0165***	0.0145***	−0.0079***	0.0115***	−0.0006
	(2.15)	(−8.46)	(−13.75)	(−3.40)	(13.52)	(10.79)	(−10.14)	(8.87)	(−0.41)
$t+7$	0.0155***	0.0181***	0.0129***	0.0056***	0.0116***	0.0150***	0.0035***	0.0034**	0.0162***
	(9.18)	(14.38)	(6.86)	(5.33)	(9.50)	(11.20)	(4.54)	(2.62)	(11.53)
$t+8$	−0.0164***	0.0030*	0.0170***	0.0036***	0.0071***	0.0113***	0.0032***	−0.0079***	0.0062***
	(−9.74)	(2.44)	(9.00)	(3.41)	(5.79)	(8.44)	(4.17)	(−6.10)	(4.38)

This table displays the cumulative abnormal return (CAR) of select stock exchanges for different days, along with their t-statistics. The t-statistics are shown in parentheses and the significance of the CAR is determined via t–test. ***, **, and * indicate significance at the 0.1%, 1%, and 5% level, respectively. The positive and negative values show the market's response to the event.

correction in market takes place post event period except few days. This study ventures to offer policy implication to the policy analyst, investors and portfolio managers. The stakeholders must hold their stocks rather than selling because of such type of collapse temporarily. Additionally, one can park their funds in Chinese market since its abnormal return was not significant on event day and post event market corrected.

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Data available on request from the authors

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Ethics approval statement

This article does not contain any studies with human participants or animals performed by any of the authors.

Declaration of Competing Interest

The authors declared no potential conflicts of interest.

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Data will be made available on request.

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