The impact of the SVB collapse on global financial markets: Substantial but narrow

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Abstract

We investigate the impact of the collapse of Silicon Valley Bank on global financial markets, identifying significant but narrow impacts. Abnormal returns are significant and negative for US equities, global banks, Bitcoin, as well as GCC equities. However, abnormal returns are insignificant for most fiat currencies, metals, and energy markets. That the SVB collapse had minimal effects on these markets suggests that the SVB event had a major but constrained effect on the global financial system, affecting significantly a small number of markets while largely ignoring others. Results highlight possible contagion points with regard to reactions to banking stress.

Keywords: Silicon Valley Bank, Bank Run, Global Financial Markets, Event Study, Contagion

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1 Introduction

It is well known that, in addition to having an impact on the banking sector, the spread of a bank contagion also has the potential to have an impact on the macroeconomy and the wider financial system (Kaufman, 1994).[1] However, interest remains for both practical and scholar reasons in how spillovers and contagion manifest following spectacular financial events, particularly in how patterns of contagion have changed since COVID (Yarovaya et al., 2022).[2]

On March 9, 2023, depositors of Silicon Valley Bank (SVB) made $42 billion worth of withdrawals in a single day. This occurred for 10 hours straight, equating to an amazing $4.2 billion each hour, or more than $1 million per second. We estimate the effects of this extraordinary bank run on various financial markets, including equity, fiat currency, metals, energy, and cryptocurrency using the event study methodology.

We contribute to the literature by examining how the SVB bank run diversely affected financial markets. Previous literature has explored the impact of the collapse of banks at different times on the financial markets. For example, Dumontaux and Pop (2013) find a significant effect of the fall of Lehman Brothers on the surviving financial institution, identifying significant impacts on equity and CDS markets. Others identify spillover from the US markets to other country markets during the Lehman Brothers crisis (Ceylan, 2021; Kim et al., 2015). Kanas (2005) evidence contagion effects in the UK that occurred prior to the official closure date of the Bank of Credit and Commerce International (BCCI), but with no comparable impacts for the US and Canada. Safa et al. (2013) evidence, for American International Group, Inc. (AIG) announced losses, a strong spillover between the insurance and banking firms as well as increased systemic risk across all financial industries following the Federal Reserve rescue. We analyze different global financial markets for the impact of SVB bank. Analyzed markets include equity markets such as regional stock indexes, forex markets including fiat currencies, digital assets such as cryptocurrencies, and commodity markets covering metals and energy markets including oil.

We employ Mackinlay's (1997) standard event-study technique to investigate the impact of the SVB implosion on global financial markets, including equity, fiat currency, metals, energy, and cryptocurrency. We compute normal returns using the market model, which we then use to determine abnormal returns. Furthermore, we add the abnormal returns throughout the event window to obtain the

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[1] Laeven and Valencia (2020) provide a list of the banking crisis that occurred between 1970 to 2017.

[2] Recent studies include Corbet and Goodell, (2022) on contagion arising from events to important energy firms; Yousaf and Goodell (2023) on the impact of the FTX collapse on digital tokens; Goodell and Huynh (2020), Marobhe, and Kansheba (2022), Yan, Jeon, and Wu (2023) on COVID-19 impacting industries, stock markets, and banks, respectively; and Boubaker et al. (2022); Saâdaoui, Ben Jabeur, and Goodell (2022), Khalfaoui, Gozgor, and Goodell (2023) on the impact of the Russian invasion of Ukraine on equities and commodities.

cumulative abnormal returns, and we average the abnormal returns across the event window to get the aggregate abnormal returns. The significance of abnormal returns, cumulative abnormal returns, aggregate abnormal returns, and cumulative abnormal returns is statistically tested. We construct an 8-day event window between t-1 and t+6 days and a 90-day estimate window between t-92 and t-2 days. We make use of data between October 26, 2022, and March 17, 2023, for the analysis.

The study shows an interesting finding: on the day of the bank run, there were significant abnormal returns on US stocks, global banks, and Bitcoin. Following the event, the GCC equity market, global banks, GBP/USD, JPY/USD, all commodity markets, WTI, Brent, Bitcoin, Ethereum, and BNB all showed significant *CARs*. Furthermore, on the t+2 day, the aggregate *AARs* of all markets are significant at the 1% level, and the aggregate *CAARs* are significant consistently following the t+2 day.

The rest of the paper is organized as follows: section 2 describes the methodology of the study, section 3 examines the data, section 4 provides discussion about the results, and section 4 concludes the investigation.

2 Methodology

We use the standard event study methodology of Mackinlay (1997) to estimate the effect of the SVB bank run on global financial markets. We calculate abnormal returns by subtracting expected (or normal) returns from actual returns. The actual returns (R_{it}) are calculated as:

$$R_{it} = \left[\frac{P_{it} - P_{it-1}}{P_{it-1}}\right] \times 100 \quad (1)$$

where P_{it} and P_{it-1} represent the price of index i at time t, and time $t-1$, respectively. To estimate normal or expected returns, we use an estimation window of 90 days (26 October 2022 to 07 March 2023). Normal returns are estimated using the market model (Yousaf et al., 2023; Umar et al., 2022). The market model is defined as:

$$\mathrm{E}(R_{it}) = \mathrm{a}_i + b_i R_{mt} \quad (2)$$

where $\mathrm{E}(R_{it})$ denotes the expected returns of index i at time t, and R_{mt} represents the market returns at time t. We calculate abnormal returns (AR_{it}) by comparing actual returns (R_{it}) to estimated daily returns ($\mathrm{E}(R_{it})$), using the formula below to derive the value of AR_{it}:

$$AR_{it} = \mathrm{R}_{it} - E(R_{it}) \quad (3)$$

where subscript i represents the index and t represents time. We calculate the cumulative abnormal return (*CARs*) for asset i during the event window between r_1 to r_2 using the following formula:

$$CAR_i(\mathrm{r}_1, \mathrm{r}_2) = \sum_{t=\mathrm{r}_1}^{\mathrm{r}_2} AR_{it} \quad (4)$$

Additionally, we calculate the aggregate abnormal returns by adding up the daily abnormal returns for each index, resulting in a sum of abnormal returns across N indexes. The formula for calculating aggregate abnormal returns is as follows:

$$AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{it} \quad (5)$$

AAR_t denotes the average abnormal returns across the indexes at time t, while N represents the number of indexes that have been considered in this study. Further, we use AAR_t to obtain the cumulative average abnormal returns (*CAARs*) over the event window.

3 Data

We use the daily data of equity (USA-S&P 500, Europe-MSCI Europe, Asia-MSCI Asia, GCC-MSCI GCC), fiat currency (EUR/USD, GBP/USD, CAD/USD, JPY/USD, CNY/USD), metals (Gold, Silver, Platinum, Palladium), energy (WTI, Brent, Heating Oil, Natural Gas), and cryptocurrency (Bitcoin, Ethereum, BNB, Tether, USDC) markets. Data for all asset series markets are from *investing.com*. The bank run on SVB was reported on March 9, 2023, which we consider the event day. Figure 1 shows the returns of the financial markets on the event day. To calculate normal returns, we applied an estimation window of 90 days from t-2 to t-92. Additionally, we defined an 8-day event window spanning from March 8, 2023 (t-1) to March 17, 2023 (t+6).

[Figure 1 about here]

4 Results

Table 1 displays the abnormal returns for different markets on the event day, with various markets showing negative returns. The abnormal returns are significant and negative for US equities, global banks equities, and Bitcoin markets at 10%, 1%, and 5% levels, respectively. Abnormal returns are insignificant for the fiat currencies, metals, and energy markets. The SVB collapse had minimal effects on these markets suggests that the SVB bank run had a major but constrained effect on the global financial system, affecting significantly a small number of markets while largely ignoring others. Such results are consistent with Iwanicz-Drozdowska et al., (2021) who suggest that the effects of bank runs are limited to specific factors rather than having a substantial worldwide impact on market contagion. However, they can have a higher impact on total contagion in a high-spillover regime. In such circumstances, these incidents can be seen as causing more panic in the market as a whole rather than as contributing to local or sectoral problems.

[Table 1 about here]

Various markets' cumulative abnormal returns (*CARs*) reveal some intriguing results. Table 2 shows that the *CARs* on the equity markets in the US, Europe, and Asia are not statistically significant, indicating that the market did not respond significantly to the event over the long term. However, three days after the occurrence, the GCC stock market exhibited significantly negative *CARs*, indicating that this event had a negative influence on this market (Foggitt et al., 2019). Additionally, one day after the incident, worldwide banks display negatively significant *CARs*, indicating, not surprisingly, that the banking industry was more seriously impacted by the bank run than other markets. Overall, *CARs* show that the bank run had a substantial influence on the international banking industry and that this impact spread to the GCC equities market. Results are noteworthy considering the importance of banking for policymakers and market players (Kanas, 2005; Safa et al., 2013).[3]

[Table 2 about here]

According to the findings reported in Table 3, the event had a positive effect on the GBP/USD and JPY/USD currencies after two days since their *CARs* are consistently significant and positive at the 5% level. The event did not, however, significantly affect the EUR/USD, CAD/USD, or CNY/USD fiat currency markets. These findings imply that the incident could have had a particular effect on the economies of the UK and Japan, as seen by the strengthening of respective currencies. Or that the market momentarily considered the recently strong USD might fall with respect to recently historically weak GBP and yen. The absence of a major response in other currency markets may suggest that the incident had a limited effect on the world economy or that other variables may have weakened the event's potential influence on these currencies.

[Table 3 about here]

The findings, reported in Table 4, show that throughout the crisis, the metal markets served as a safe haven for investors (Salisu et al., 2021; Yousaf et al., 2023). At a 1% level, all metal markets exhibit considerable positive cumulative abnormal returns (*CARs*). This shows that investors' attention has switched to metals as a safe investment choice (Huynh et al., 2020; Ghabri et al., 2022). The outcomes of the event analysis for the oil markets are shown in Table 5. After the third day of the event, results indicate a significant and negative reaction to the event for both the WTI and Brent markets. The *CARs* for these markets are significant at 10% or 5% following the event. However, the markets for natural gas and heating oil did not have a meaningful response.[4]

[3] See Saâdaoui, Ben Jabeur, and Goodell (2023)
[4] Yousaf et al. (2023) also demonstrate that the energy markets did not react to the collapse of FTX.

[Table 4 about here]

[Table 5 about here]

As reported in Table 6, there was some variation in how the cryptocurrency markets responded to the incident. In particular, one day after the bank run, Bitcoin's reaction was first negative and significant at 5%, but then later changed to a positive reaction and remained significant. Similar patterns were also seen in Ethereum and other cryptocurrencies. However, for Ethereum and BNB, the cumulative anomalous returns turned significant only after two and four days, respectively.[5] These findings suggest that the cryptocurrency markets, while sensitive to global events, their reactions can be nuanced. Dai et al. (2023) propose that about 80% of the crashes in the financial markets and cryptocurrencies occur simultaneously.

[Table 6 about here]

Table 7 reports the overall collective effect of the SVB bank run on the analyszed markets. Two days after the event, the positive and large aggregate *AARs* show that the event had a direct impact on the markets. For other days, however, aggregate *AARs* are small, indicating that the effect was not sustained. Market values generally grew following the run on SVB and persisted in the days that followed, though at a slower rate, as indicated by positive and significant aggregate *CAARs* after two days. The influence was statistically significant, but not as strong as the initial effect, according to the significant *CAARs* at 5% after t+2 days and 10% afterward. These findings collectively imply that the SVB bank run had a favorable influence on the market value of other markets, even if the effect was short-lived. This may be the result of the substitution effect, in which investors switch investments during times of crisis if they fear losing a particular investment (Umar et al., 2022).

[Table 7 about here]

5 Conclusions

We investigate the effects of the Silicon Valley Bank collapse on several international financial markets. Results show that the bank run affected only a small number of markets while mostly ignoring others, having a major but narrow impact on the global financial system. While metal markets were negligibly impacted, US equities, global banking stocks, and Bitcoin markets displayed considerable

[5] Yousaf and Goodell (2023) show a negative effect of the collapse of FTX on cryptocurrencies.

negative abnormal returns. Further, findings indicate that the bank run had a significant impact on the global banking sector and that this impact propagated to the GCC stock market.

Abnormal returns are insignificant for most fiat currencies, metals, and energy markets. Results are consistent with the SVB event having a major but constrained effect on global financial markets, affecting significantly a small number of markets while largely ignoring others. Results highlight possible nodes of contagion with regard to reactions to banking stress.

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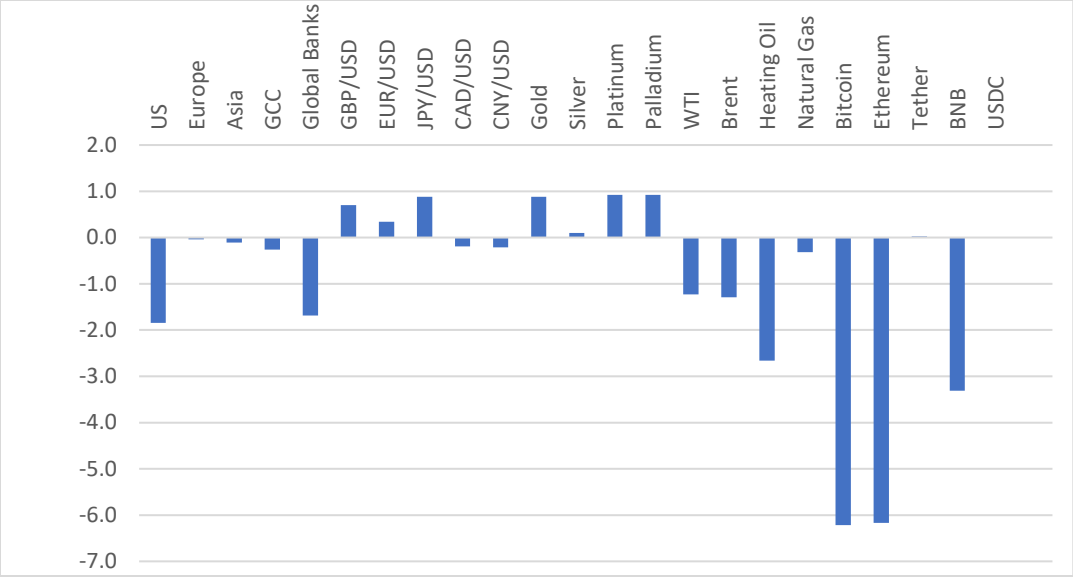

Figure 1. Returns on the event day in financial markets

Table 1. Abnormal returns (AR) on the event day

	AR	$t\ stat_{AR}$		AR	$t\ stat_{AR}$
Panel A. Equity markets			Panel D. Energy markets		
US	-1.850	-1.756*	WTI	-1.114	-0.533
Europe	-0.186	-0.601	Brent	-1.179	-0.584
Asia	-0.266	-0.343	Heating Oil	-2.456	-0.658
GCC	-0.198	-0.258	Natural Gas	0.339	0.056
Global Banks	-1.874	-3.047***			
Panel B. Fiat Currencies			Panel E. Cryptocurrencies		
GBP/USD	0.697	1.198	Bitcoin	-6.326	-1.961**
EUR/USD	0.301	0.644	Ethereum	-6.256	-1.483
JPY/USD	0.822	1.032	Tether	0.020	0.866
CAD/USD	-0.166	-0.363	BNB	-3.346	-0.848
CNY/USD	-0.242	-0.577	USDC	0.000	-0.013
Panel C. Metals					
Gold	0.807	1.130			
Silver	0.098	0.061			
Platinum	0.950	0.559			
Palladium	1.343	0.549			

Notes: US-United States, GCC-Gulf Cooperation Council, WTI-West Texas Intermediate. ***, **, * indicate the 1, 5, and 10 percent levels of significance, respectively.

Table 2. Cumulative abnormal returns (*CAR*) of equity markets

	US	Europe	Asia	GCC	Global Banks
t-1	0.376	0.002	-0.815	0.366	-0.160
	(0.325)	(0.002)	(-0.767)	(0.400)	(-0.157)
t+1	-2.402	0.310	-1.989	0.208	-4.071**
	(-1.198)	(0.161)	(-1.081)	(0.131)	(-2.297)
t+2	-1.603	-0.245	-0.554	-1.446	-7.447***
	(-0.692)	(-0.111)	(-0.261)	(-0.789)	(-3.639)
t+3	0.107	1.089	-2.957	-4.157**	-6.967***
	(0.041)	(0.439)	(-1.245)	(-2.030)	(-3.045)
t+4	1.283	-0.562	-0.099	-4.084*	-9.881***
	(0.452)	(-0.207)	(-0.038)	(-1.820)	(-3.942)
t+5	2.482	0.421	-1.855	-4.740*	-9.444***
	(0.811)	(0.143)	(-0.660)	(-1.956)	(-3.488)
t+6	1.563	-0.375	-0.206	-4.500*	-11.301***
	(0.477)	(-0.119)	(-0.069)	(-1.737)	(-3.904)

Notes: ***, **, * indicate the 1, 5, and 10 percent levels of significance, respectively. Parenthesis contains the t-stats.

Table 3. Cumulative abnormal returns (*CAR*) of fiat currencies

	GBP/USD	EUR/USD	JPY/USD	CAD/USD	CNY/USD
t-1	0.329	0.080	-0.013	-0.216	0.195
	(0.348)	(0.093)	(-0.013)	(-0.260)	(0.240)
t+1	2.336	1.263	2.037	-0.133	0.951
	(1.429)	(0.847)	(1.167)	(-0.092)	(0.676)
t+2	4.426**	2.627	4.094**	1.044	2.173
	(2.344)	(1.525)	(2.031)	(0.629)	(1.338)
t+3	4.262**	2.635	3.318	1.388	1.809
	(2.019)	(1.368)	(1.472)	(0.747)	(0.996)
t+4	5.136**	2.324	5.421**	1.633	2.009
	(2.221)	(1.102)	(2.195)	(0.803)	(1.010)
t+5	5.030**	2.308	4.954*	1.772	1.906
	(2.014)	(1.013)	(1.858)	(0.806)	(0.888)
t+6	5.674**	2.864	6.183**	1.823	2.080
	(2.125)	(1.176)	(2.169)	(0.776)	(0.906)

Notes: ***, **, * indicate the 1, 5, and 10 percent levels of significance, respectively. Parenthesis contains the t-stats.

Table 4. Cumulative abnormal returns (*CAR*) of metals

	Gold	Silver	Platinum	Palladium
t-1	0.067	0.092	0.887	0.317
	(0.066)	(0.060)	(0.541)	(0.145)
t+1	3.052*	2.675	4.102	2.312
	(1.769)	(1.011)	(1.445)	(0.612)
t+2	6.481***	10.980***	10.170***	13.199***
	(3.254)	(3.592)	(3.103)	(3.025)
t+3	6.147***	11.650***	9.495***	16.466***
	(2.760)	(3.409)	(2.592)	(3.375)
t+4	8.867***	13.638***	10.025***	16.228***
	(3.635)	(3.643)	(2.498)	(3.037)
t+5	7.998***	13.252***	10.379**	14.249**
	(3.035)	(3.277)	(2.394)	(2.469)
t+6	11.634***	17.585***	10.556***	14.197**
	(4.130)	(4.068)	(2.278)	(2.301)

Notes: ***, **, * indicate the 1, 5, and 10 percent levels of significance, respectively. Parenthesis contains the t-stats.

Table 5. Cumulative abnormal returns (*CAR*) of energy markets

	WTI	Brent	Heating Oil	Natural Gas
t-1	-0.891	-0.459	-1.773	-4.282
	(-0.526)	(-0.278)	(-0.648)	(-0.984)
t+1	-0.226	0.334	-0.110	-7.458
	(-0.077)	(0.117)	(-0.023)	(-0.989)
t+2	-1.839	-1.253	-0.285	0.942
	(-0.543)	(-0.380)	(-0.052)	(0.108)
t+3	-6.340*	-5.222	-1.783	0.346
	(-1.674)	(-1.416)	(-0.291)	(0.036)
t+4	-9.989**	-8.510**	-5.551	-3.199
	(-2.408)	(-2.106)	(-0.828)	(-0.300)
t+5	-9.232**	-7.457*	-3.887	0.401
	(-2.060)	(-1.709)	(-0.537)	(0.035)
t+6	-11.890**	-10.172**	-2.642	-5.520
	(-2.482)	(-2.180)	(-0.341)	(-0.448)

Notes: ***, **, * indicate the 1, 5, and 10 percent levels of significance, respectively. Parenthesis contains the t-stats.

Table 6. Cumulative abnormal returns (*CAR*) of cryptocurrencies

	Bitcoin	Ethereum	Tether	BNB	USDC
t-1	-1.964	-1.396	-0.001	-0.403	-0.001
	(-0.788)	(-0.428)	(-0.001)	(-0.134)	(-0.001)
t+1	-8.662**	-7.391	0.338	-2.845	-0.523
	(-2.006)	(-1.309)	(0.265)	(-0.545)	(-0.411)
t+2	12.223**	11.970*	0.414	9.764	-0.535
	(2.451)	(1.836)	(0.282)	(1.620)	(-0.364)
t+3	14.586***	13.522*	0.295	10.045	-0.435
	(2.616)	(1.855)	(0.179)	(1.491)	(-0.265)
t+4	15.512**	14.718*	0.358	12.706*	-0.419
	(2.540)	(1.843)	(0.199)	(1.722)	(-0.233)
t+5	17.583***	14.866*	0.201	19.215**	-0.248
	(2.665)	(1.723)	(0.103)	(2.410)	(-0.128)
t+6	23.353***	17.557*	0.151	20.760**	-0.219
	(3.311)	(1.904)	(0.072)	(2.436)	(-0.105)

Notes: ***, **, * indicate the 1, 5, and 10 percent levels of significance, respectively. Parenthesis contains the t-stats.

Table 7. Aggregate *AARs* and *CAARs* of all markets

	AAR	*AAR* t stat	*CAAR*	*CAAR* t stat
t-1	-0.42016	-0.522	-0.420	-0.522
0	-0.87307	-1.086	-1.293	-1.137
t+1	0.602319	0.749	-0.691	-0.496
t+2	3.964819	4.930***	3.274	2.035**
t+3	-0.26098	-0.324	3.013	1.675*
t+4	-0.07537	-0.094	2.938	1.491
t+5	0.547373	0.681	3.485	1.638*
t+6	0.391483	0.487	3.876	1.704*

Notes: ***, **, * indicate the 1, 5, and 10 percent levels of significance, respectively. Parenthesis contains the t-stats.