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The collapse of Silicon Valley Bank and Credit Suisse and their impact on other U.S. Banks

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ABSTRACT

This paper examines how US banking industry responded to the collapse of Silicon Valley Bank and Credit Suisse. The analysis of abnormal returns surrounding the announcement of the collapse of Silicon Valley Bank and Credit Suisse reveals a negative and statistically significant impact on the largest listed US banks. Banks' market value loss is explained by information asymmetries and uncertainty returns, systemic contagion, and panic. These reactions are reinforced or mitigated by bank-specific characteristics such as size, liquidity, profitability, risk aversion, operational efficiency, institutional ownership, internationalization, dependence on uninsured deposits and ratio of off-balance sheet items.

KEYWORDS

Banks; collapse; market reaction; event study; contagion

JEL CLASSIFICATION

G01; G14; G21

I. Introduction

The month of March 2023 was in the news due to the collapse of Silicon Valley Bank (SVB) and Credit Suisse (CS). On the 10th of March, SVB collapsed, the second-largest failure since the financial crisis. With total assets of $ 209 billion,[1] SVB was among the top 20 largest commercial banks in the US in 2022. Five days later, we witnessed the intervention of the Swiss authorities in the CS bank, after several years of scandals and mismanagement, which led to multi-billion dollar losses.[2] CS bank is among the world's largest wealth managers, and it is one of 30 global systemically important banks, whose bankruptcy could threaten the stability of the whole financial system.

There are two complementary approaches in the literature regarding the consequences of 'bank runs' for the stock market: (*i*) 'contagion and panic' approach and (*ii*) 'fundamentalist' approach (e.g. Calomiris 2007). The model by Diamond and Dybvig (1983) shows that banks are very vulnerable to panics, or 'bank runs'. One of the Nash equilibria of the model is 'bank runs'. This can happen when a large fraction of depositors decide to withdraw their funds, where the rational response for the remainder is to rush to take their funds before the remaining depositors withdraw theirs. In that circumstance, depositors may withdraw large amount of funds from all banks, including those that have (unobservable) good financial health.

The 'fundamentalist' approach states that banks, through their prudential decisions to reduce the supply of loans and deposits in response to adverse shocks can amplify macroeconomic shocks and turn it into a bank run (e.g. Levy-Yeyati, Martinez Peria, and Schmukler 2010), even if banks are passive responders to shocks and even if depositors avoid engaging in unwarranted runs or panics (Calomiris 2007). As explained by Morris and Shin (2012), when the economy is healthy with strong fundamentals, information asymmetries tend to be neglected by agents, but when a shock affects the economy, those asymmetries might destroy confidence and, potentially, markets. Gertler *et al.* (2020) show that in recession, banks may have sufficiently weak balance sheets so as to open up the possibility of a run. Depending on the circumstances either a small shock or no further shock can generate a run that has devasting consequences for the real economy. According to the

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[1]https://globaledge.msu.edu/blog/post/57251/effects-of-the-silicon-valley-bank-colla.

[2]https://www.cnbc.com/2023/03/17/credit-suisse-timeline-how-years-of-turbulence-came-to-a-head.html.

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authors, crisis may occur even in the absence of large exogenous shocks to the economy.

An extensive literature provides evidence that banking crises are not simply due to random realizations of negative shocks, but rather deeply connected to prior credit booms (e.g. Baron, Verner, and Xiong 2021). Specifically, credit booms predict a higher probability of banking crisis (e.g. Baron and Xiong 2017) and coincide with low credit spreads and an increase in debt issuance by riskier borrowers (e.g. Krishnamurthy and Muir 2017). Following a period of positive shocks, lenders may over-extrapolate recent low defaults and neglect downside risk, leading to the underpricing of risk during the credit boom and subsequent bank asset losses (e.g. Bordalo, Gennaioli, and Shleifer 2018). Overall, credit booms increase the fragility of the banking system and the economy, leaving banks vulnerable to future losses that lead to bank capital crunches or even panics (Baron, Verner, and Xiong 2021).

In this study, I examine the stock market's reaction to the announcement of the collapse of SVB and CS, for the 100 largest US listed banks. A recent study by Yadav et al. (2023), using an event study, analysed the impact of SVB fall on the top nine global equity indices. The present study differs from this study by extending the analysis to Credit Suisse and for studying the bank-specific characteristics valued by the market. The contributions of the present study lie in its ability to provide a comprehensive understanding of the impact of the SVB and CS collapse on the US equity market.

II. Data and methodology

The data used in the event study is collected from different sources. Bank's stock returns and S&P 500 index were obtained from Eikon Refinitiv and Bank Call Reports. Regarding the selection of US listed banks, I selected the 100 largest US listed banks, based on its market capitalization.

To measure the magnitude of stock price reaction to the collapse announcements of banks SVB and CS, I used the standard abnormal returns technique based on the market model and the Fama and French (1993) three-factor abnormal returns. The Fama-French factors SMB and HML are taken for the US market and obtained from the homepage of Kenneth French at Dartmouth College.[3] I used the announcement dates of the collapse of the SVB (10th March) and CS (15th March) banks as event dates ($t = 0$) to compute the abnormal returns (ARs). Daily returns are collected for the period ($t = -140$ to 20). The estimation and event periods were defined respectively as [−140; −21] and [−1; 10]. Three different time intervals for the CARs were considered: [−1,1], [−5,5] and [−5,10]. Identical event windows were adopted by Martins et al. (2023).

For cross-sectional analyses, I used the control variables presented in Table 1. Control variables

Table 1. Determinants of CARs.

Variable	Notation	Measure	Expected Effect	Mean	Standard Deviation
Size	SIZE	Market capitalization in USD (natural logarithm)	+/–No	$12,865 ml	$47,294 ml
Institutional Ownership	INST	Percentage of stock that are in possession of institutional investors (%)	-	74.4%	17.1%
Liquidity Risk	LIQ	Ratio of liquid assets to short-term funding (deposits and short-term funding) (%)	+/–/No	7.5%	8.4%
Profitability	NIM	Net interest margin (in %)	+	3.4%	2.7%
Capitalization/Risk Aversion	EA	Ratio of equity to total average assets (%)	+/–	10.9%	4.2%
Credit Risk/Asset Structure	LA	Ratio of loans to total average assets (%)	+/–/No	62.3%	14.6%
Operational Efficiency	CIR	Cost-to-income ratio (%). Total expenses over total generated revenues as a measure of operational efficiency.	-	61.5%	12.0%
Foreign Deposits Ratio	FDR	Ratio of foreign deposits to total deposits (%)	+/–/No	1.9%	4.3%
Uninsured Deposits	UNDEP	Ratio of uninsured deposits to total deposits (%)	-	47.4%	9.7%
Size of Bank's Off-Balance Sheet Items	OFF	Ratio of bank's off-balance sheet items to the on-balance sheet total assets (%)	-	18.5%	8.4%

[3] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

were obtained from Eikon Refinitiv (2022 year-end accounting figures). The first seven control variables are based on the recent event study by Martins et al. (2023), which analyses the impact of the invasion of Ukraine on the European banking sector. *FDR* variable is included because global banks can respond to a domestic liquidity shock by accessing to the internal capital market with foreign offices. The lending of global banks is likely to be more insulated from domestic liquidity shocks. On other hand, banks managing liquidity globally may increase the international propagation of domestic liquidity shocks (e.g. Cetorelli and Goldberg 2012). Assuming that depositors discipline exists, and interest rates do not fully adjust to reflect risk, it is expected that healthy institutions should be more easily able to attract uninsured depositors than institutions which are failing. Uninsured deposits represent a significant source of funding for commercial banks, accounting for about half of their deposits, which can make runs a significant risk for these institutions (Jiang et al. 2023). Like, Goldberg and Hudgins (1996), I include in the cross-sectional analysis the ratio of uninsured deposits to total deposits (*UNDEP*). Finally, contrary to publicly available and market-to-market assets, where it is easy for market participants to evaluate the health of institutions, for the bank's off-balance sheet assets there is less information available to outsiders about factors which ultimately affect banks' payoffs on these assets (e.g. Cao and Juelsrud 2022). Like these authors, I use the variable *OFF* to control potential effects on CARs.

To estimate the impact of bank-specific characteristics on the cross-sectional variation of abnormal returns, I estimate the following equation by OLS:

$$CAR_{iw} = \beta_0 + \beta_1 \ln(SIZE_i) + \beta_2 INST_i + \beta_3 LIQ_i + \beta_4 NIM_i + \beta_5 EA_i + \beta_6 LA_i + \beta_7 CIR_i + \beta_8 FDR_i + \beta_9 UNDEP_i + \beta_{10} OFF_i + \varepsilon_{iw} \quad (1)$$

where, CAR_i is the cumulative abnormal returns for bank i for event window [−1; 1]. Robust standard errors are used in the estimation of Equation (1).

III. Results

Table 2 presents the cumulative abnormal returns observed around the collapse announcements of banks SVB and CS. Given that event windows are overlap, the results must be read with caution, as there is a risk of contamination of one event by the other. It is possible to observe a negative and statistically significant stock price reaction around these two events for the three-time intervals. The parametric and non-parametric tests show that there is a level of statistical significance of 1% for these three-time intervals for both models. The negative stock market reaction is explained by the fact that the failure of banks can undermine the confidence of agents regarding the soundness of the banking system, which can ultimately lead depositors to rush to withdraw their deposits and spread to other depositors due to the panic and financial contagion in a domino effect.

Table 2. Cars and abnormal return tests.

Variable	Model	Mean	SD	25th perc.	Median	75th perc.	θ_1	τ_1
SVB Announcement (March 10th, 2023)								
CAR [−1,1]	MM	−11.88%	10.81%	−16.59%	−9.62%	−4.65%	0.004***	0.004***
	FF3	−10.47%	10.37%	−14.28%	−8.65%	−2.19%	0.004***	0.004***
CAR [−1,5]	MM	−19.94%	10.85%	−24.99%	−18.34%	−13.07%	0.003***	0.002***
	FF3	−16.94%	9.29%	−21.72%	−15.42%	−11.63%	0.004***	0.003***
CAR [−1,10]	MM	−21.01%	10.55%	−26.07%	−20.29%	−13.63%	0.003***	0.003***
	FF3	−19.04%	10.43%	−21.99%	−17.65%	−12.06%	0.003***	0.003***
CS Announcement (March 16th, 2023)								
CAR [−1,1]	MM	−13.18%	10.54%	−17.82%	−10.98%	−6.24%	0.003***	0.002***
	FF3	−11.16%	9.30%	−15.65%	−9.98%	−5.02%	0.004***	0.003***
CAR [−1,5]	MM	−19.50%	11.05%	−25.04%	−18.06%	−11.46%	0.003***	0.003***
	FF3	−16.58%	9.43%	−21.81%	−15.48%	−11.05%	0.004***	0.003***
CAR [−1,10]	MM	−20.01%	10.98%	−26.34%	−19.41%	−11.40%	0.004***	0.004***
	FF3	−18.93%	10.79%	−22.77%	−16.82%	−9.88%	0.004***	0.004***

This table presents the CARs calculated using market model (*MM*) and the three-factor model of Fama and French (1993) (*FF3*). θ_1 and τ_1 are the *p-values* of Brown and Warner (1985) *t*-test statistics and *z*-statistic for the sign test, respectively. *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Table 3. Cross-sectional analysis of CARs for the largest U.S. Banks.

	SVB Announcement		CS Announcement	
	MM	FF3	MM	FF3
Constant	0.091	0.084	0.081	0.026
	(0.382)	(0.626)	(0.348)	(0.549)
Ln(SIZE)	0.015*	0.014*	0.016*	0.017**
	(1.722)	(1.704)	(1.895)	(1.998)
INST	−0.122**	−0.131**	−0.112**	−0.152**
	(−2.023)	(−2.155)	(−2.550)	(−2.147)
LIQ	0.266***	0.233**	0.255***	0.265**
	(2.756)	(2.368)	(2.703)	(2.296)
NIM	1.963***	1.567**	1.785**	1.314**
	(2.953)	(2.564)	(2.310)	(2.138)
EA	1.638***	1.484***	1.578***	1.696***
	(3.967)	(3.454)	(3.005)	(3.256)
LA	−0.006	−0.010	−0.003	−0.002
	(−0.079)	(−0.209)	(−0.039)	(−0.055)
CIR	−0.122*	−0.104*	−0.136*	−0.114*
	(−1.821)	(−1.788)	(−1.722)	(−1.720)
FDR	0.022	0.033	−0.185*	−0.198**
	(1.315)	(1.489)	(−1.910)	(−1.998)
UNDEP	−0.375***	−0.382***	−0.292**	−0.275**
	(−2.734)	(−2.811)	(−2.134)	(−2.076)
OFF	−0.288**	−0.295**	−0.244**	−0.230**
	(−2.567)	(−2.588)	(−2.233)	(−2.143)
# Obs.	100	100	100	100
Adj. R^2	0.401	0.391	0.389	0.377

This table presents the cross-sectional estimates for the CARs around the SVB and CS collapse announcements to the 100 largest US banks. The dependent variable is the bank CARs for event windows [−1,1], calculated using market model (MM) and the three-factor model of Fama and French (1993) (*FF3*). *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively. *t*-values from robust errors are reported in parentheses.

In addition, I am interested in examining how stock market reactions are affected by bank-specific characteristics. The results presented in Table 3 show that a higher market capitalization (*SIZE*), risk aversion (*EA*), profitability (*NIM*), liquidity (*LIQ*) and operational efficiency (*CIR*) help to mitigate the negative impact caused by the collapse of the two banks. Given that bank collapse announcements cause problems of uncertainty and information asymmetry about banks' financial conditions among depositors and investors, it is not surprising that banks with good financial health signal their financial situation to the market and, as such, will be less penalized by the stock market. For banks most dependent on foreign (in the case of CS announcement) and uninsured deposits and with a higher ratio of off-balance sheet items there was a sharper fall in market values after the collapse of the two banks. As explained by Jiang et al. (2023), banks with a higher uninsured leverage and unbooked securities are more prone to runs than those of other banks.

Finally, I found a negative and statistically significant coefficient for the *INST* variable. The literature shows that institutional investors tend to be better informed than other market participants and they have a greater focus on value maximization (e.g. Boehmer and Kelley 2009). Since the collapse of banks are high-risk events, it is expected that institutional investors react to it negatively, carrying out a reorganization of its portfolios, shifting its holdings in the banking sector to relatively safe investments (Liu et al. 2003).

IV. Conclusion

The study examines the stock market impact of the collapse of SVB and CS banks, for the 100 largest US listed banks. The results show negative and statistically significant abnormal returns around the announcement of the collapse of these two banks. Banks with good financial health (high liquidity, profitability, operational efficiency, and market capitalization), with risk aversion and greater transparency and less dependent on uninsured deposits are the most resilient to the negative shocks caused by the collapse of the two banks under analysis.

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