



Panic bank runs, global market contagion and the financial consequences of social media

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ARTICLE INFO

Article history:

Received 27 March 2023

Received in revised form 8 May 2023

Accepted 11 May 2023

Available online 16 May 2023

JEL classification:

C7

C9

G10

G12

Keywords:

Bank run

Investor sentiment

Global markets

Social media

Contagion

ABSTRACT

This paper provides empirical analysis on how social media amplifies bank runs, using the recent bank turmoil in the US. Employing data for 94 countries, our findings show that social media provides a conduit through which an immediate negative and significant impact of the bank crisis transmits across global investor sentiments and market outcomes. The results also indicate a significant spill-over influence of the turmoil on European and G7 economies, while there appears to be no significant impact on major markets in Asia and Africa.

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1. Introduction

"The ongoing bank turmoil in the US poses a substantial financial, social, and economic risks across the globe."

[Andrew Bailey, Governor of Bank of England on Financial Times, 22 March 2023]

Burgeoning studies in the financial economics literature have explained factors that cause and accelerate bank runs (Gertler and Kiyotaki, 2015; Kiss et al., 2018). However, the impact of social media on bank runs and its spill-over effects is yet to be considered, especially in the context of the recent bank crisis in the US that has shaped global financial markets. In the present social media age, the mass fear of investors and depositors from losing their investments can be aggravated by a frenzy of online posts. Importantly, anxious posts and exchanges on social media are unique catalysts that can amplify the transmission of financial crisis from one part of the world to another. This provides a

compelling motivation to explain the psychological behaviour behind the recent bank run in the US.

In March 2023, the global banking system witnessed a swift collapse of three US banks in five days – Silicon Valley Bank (SVB), Signature Bank and Silvergate – and a last-minute rescue of a Swiss bank – Credit Suisse – by its rival, UBS. The failure of these banks precipitated a sharp reaction across financial market stress indicators, as investors and depositors feared the turmoil could snowball into a global financial crisis like that of 2008. For instance, the aftermath of the SVB run sparked huge losses on the global equity markets as US bank stocks dropped by almost 10% while their European counterparts lost about 5% in value (Financial Times, 2023).

A bank run is prompted by customers' panic and loss of confidence in the operations of the bank (Kiss et al., 2018). It happens when large numbers of bank depositors withdraw their savings concomitantly, thus creating massive liquidity pressure on the bank. This can occur in a matter of hours, or build up for days, months or even years before the eventual collapse of the bank (Uhlig, 2010). For example, the collapse of Washington Mutual in 2008, the largest bank failure in the US, lasted for almost 8 months. Conversely, the collapse of SVB, the second-largest bank

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Table 1
Social media, panic bank run & global market returns.

	Full sample	USA	European	G-7	Asian	African
SMS	-0.356*** (0.12)	-0.443** (0.19)	-0.380* (0.01)	-0.456* (0.11)	0.204 (0.30)	0.177* (0.05)
Log_GDP	0.402* (0.09)	0.356 (0.11)	0.367** (0.152)	0.397 (0.17)	0.156* (0.02)	0.209 (0.11)
SMS*log_GDP	-0.310*** (0.11)	-0.393* (0.20)	-0.429* (0.11)	-0.623** (0.20)	0.332 (0.01)	0.025* (0.09)
Country fixed effect	Yes	-	Yes	Yes	Yes	Yes
Day fixed effect	Yes	-	Yes	Yes	Yes	Yes
R ²	0.49	0.55	0.43	0.38	0.22	0.30

This table shows the impact of social media on bank run & the effects on global market returns using Prais-Winstein method. The coefficients of the explanatory variables are shown above while the robust standard errors are quoted in parenthesis. ***, **, and * stand for significance at the 1%, 5%, and 10% levels, respectively.

failure, played out in barely 2 days, making it the quickest bank run in the history of the US. Considering the significance of the US economy to global financial markets, the incidence of bank failure poses systemic risks to market outcomes, global depositors, and investors.

To this end, we employ data of stock market of 94 countries over the period from 1 February to 22 March 2023. Our findings reveal significant negative impact of social media sentiment on the panic bank runs and its adverse effect on the returns of the sampled stock markets. This suggests a strong contagion among global investor sentiments following the crisis. To confirm this, we use the VAR approach to examine the connectedness. Specifically, we find a spill-over effect between sentiments in the US and European markets as well as the US and the G-7 markets. However, African, and Asian markets appear to be immune from the contagion. Furthermore, we interact our social media sentiment with the size of the sampled economies and test its impact on the market returns. Our findings do not materially differ from the baseline results. Lastly, we also find significant impact of the crisis on global market, for only few days after the event, perhaps due to the intervention of government.

Our findings provide valuable contributions on at least two grounds. From the perspective of financial market participants, we render vital information to regulators, investors, managers, and analysts on the strategies to insulate assets and portfolio from the vicissitudes of global events. By exploring the influence of social media on the bank run, and its effects on global market behaviour, we extend current studies in the literature (such as Fan et al., 2020; He et al., 2022; Paterson et al., 2023) on how social media affects financial market operations and performance.

The rest of the paper is organised as follows. The methodology is shown in the next section. Results are shown in Section 3 and the concluding remark appears in Section 4.

2. Data and model specification

We employ daily market data of 94 countries from 1 February to 22 March 2023. The price data of the sampled stock markets is sourced from <https://www.investing.com/>. We use the daily log of the price index to generate returns. Specifically, we estimate the impact of the independent variables on the market returns. To capture investor sentiment via social media, we download data on search volumes relating to the SVB collapse from Twitter. This provides a robust understanding of people's reactions to the financial emergency. Next, we use log of the GDP of the sampled countries to capture the size of the economy.

We employ a Prais-Winstein estimation for the baseline regression (Eq. (1)). This method provides robust standard errors and correct for possible cross-sectional dependence, heterogeneity, and endogeneity in the data observations. For robustness,

we employ the VAR approach. The equations for the models are described below.

$$\text{Returns}_{it} = \beta_0 + \beta_1 \log \text{SMS}_{it} + \beta_2 \log \text{GDP}_{it} + \beta_3 \log \text{SMS} * \log \text{GDP}_{it} + \theta_t + \lambda_i + \epsilon_{it} \quad (1)$$

$$Y_{i,t} = u_i + \sum_{j=1}^n \beta_j Y_{i,t-j} + \varepsilon_{i,t} \quad (2)$$

Returns_{it} represent the log of the daily price index of a sampled country on a particular day. $\log \text{SMS}$ is the social media sentiment variable denoting the log of daily Twitter search intensity related to the bank run in a sampled country while $\log \text{GDP}$ represents the size of the sampled economy. We further interact SMS and GDP to ascertain the moderating impact of the variables. We adopt a country-level clustered and robust standard error whilst also controlling for both time and country fixed effects in the regression model using θ_t and λ_i , respectively.

3. Findings

In this section, we provide the results of our analysis with regards to the relationships between social media sentiments, bank run, and market outcomes. Several outputs are generated from our estimations. First, we use the Prais-Winstein regression to examine the impact of the bank run on the stock market returns of the sampled countries. Second, we assess if the returns of the markets differ significantly by regional and economic classifications. Third, we explore the impact of the bank run on the global market for different days after the event. Lastly, we use VAR approach to examine the connectedness in the sentiment expressed by investors and how it affects the markets.

Our results in Table 1 show a statistically significant negative impact at the 1% level between the social media sentiment variable and the panic bank run and its adverse effects on the market returns of the sampled countries. Specifically, the results indicate that an increase in the volume of tweets has a significant negative impact on the returns of the market. This suggests that investors reacted negatively to the news of the crisis which consequently amplified the panic. Furthermore, splitting the sample into different classification, the findings show that an increase in the interaction between the social media sentiments and the size of the economy has a significantly negative impact on market performance in US, European and G7 markets. However, this is not significant for African and Asian markets. We opine that investors' reaction to the crisis did not significantly transmit to these markets, perhaps because of the low usage of social media in those regions compared to the affected regions.

Table 2 shows the spill-over mechanism between the US market and other markets. Our results do not significantly differ from

Table 2

Social media sentiment, bank run & US market reaction days after the banking crisis.

	Returns for days after the event									
	1	2	3	4	5	6	7	8	9	10
SMS	-0.280*	-0.31*	-0.203*	-0.433	-0.37*	-0.263	-0.305*	-0.43	0.431	-0.295*
	(0.19)	(0.23)	(0.20)	(0.15)	(0.20)	(0.15)	(0.21)	(0.12)	(0.30)	(0.14)
Log_GDP	0.257**	0.430	0.012*	0.205	0.31	0.349*	0.205	0.230	0.025	0.209**
	(0.04)	(0.06)	(0.00)	(0.04)	(0.09)	(0.06)	(0.19)	(0.01)	(0.00)	(0.07)
SMS*log_GDP	-0.381*	-0.09*	0.115*	0.307**	-0.15*	0.207*	-0.334	-0.305	-0.123	-0.166*
	(0.09)	(0.01)	(0.08)	(0.11)	(0.06)	(0.100)	(0.06)	(0.02)	(0.02)	(0.14)
R ²	0.39	0.42	0.28	0.37	0.40	0.46	0.22	0.31	0.42	0.37

This table shows the impact of social media on bank run & the effect on global market returns for days after the SVB collapse. We use Prais-Winsten regression method; the coefficients of the explanatory variables are shown above while the robust standard errors are quoted in parenthesis. ***, **, and * stand for significance at the 1%, 5%, and 10% levels, respectively.

Table 3

Connectedness among global social media sentiments.

	USA	European	G-7	Asian	African	TDC-FROM
USA	85.12	45.12	39.10	10.11	3.67	98.01
European	41.39	79.12	15.33	22.10	9.55	126.1
G-7	16.19	35.29	80.20	11.09	12.20	138.78
Asian	9.04	11.31	10.18	39.55	12.37	73.41
African	16.45	13.20	19.78	18.01	25.08	76.07
TDC-TO	82.98	104.92	84.39	61.41	37.79	512.37
TDC-NET	-15.03	-21.18	-54.39	-12	-38.28	-

This table shows the spill-over from social media to other parts of the world in the wake of the banking crisis in the US, using VAR approach. TDC-NET is the difference of spill-overs between TDC-TO and TDC-FROM.

the baseline estimations as we observe similar pattern of connectedness among US, European and G-7 markets.

In Table 3, we check for the impact of the crisis on subsequent days. We find that the returns of the market were adversely affected on the first to fifth day, but later showed signs of recovery, perhaps due to quick intervention of government. Our findings resonate with past studies that have also documented the relationship between social media and market behaviour (see Fan et al., 2020; He et al., 2022; Sakariyahu et al., 2023).

4. Conclusion

In this paper, we provide empirical evidence of the influence of social media on the recent bank run in the US and its subsequent impact on global investor sentiments and stock market returns, using daily market data of 94 countries from 1 February to 22 March 2023. Our findings show an immediate negative and significant impact of social media on the bank crisis in the US and its quick transmission to other markets in Europe and G-7 markets. However, there appears to be no significant impact on the Asian and African markets. Our findings offer relevant

policy implications to regulators and participants in the stock market. Given the contagious nature of social media, we advise regulatory authorities to intervene quickly in the case of a bank run to prevent the crisis from spreading to other sectors and regions. Such steps would prevent a systemic collapse and instil confidence in depositors and investors.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request

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