SOCIAL MEDIA AS A BANK RUN CATALYST

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A bank run can be a **self-fulfilling prophecy**:

- “good” equilibrium: depositors have a low belief in running \( \Rightarrow P[run] \) is low.
- “bad” equilibrium: depositors have a high belief in running \( \Rightarrow P[run] \) is high.

Why/when do depositors end up in the “bad” equilibrium?

- ‘sunspots’, communication via word of mouth, social propagation mechanisms

**Our question**: Does exposure to social media – as a communication technology – raise the risk of bank runs?
The first “social media, internet bank run in U.S. history”
- Senator, Mark Warner

"If a bank has an overwhelming run that's spurred by social media ... so that it is seeing deposits flee at that pace, the bank can be put in danger of failing,"
- Janet Yellen, Treasury Secretary

**Our Interest:** Did social media exposure matter for other banks?
OUR EMPIRICAL STRATEGY:  
**TWITTER DATA AND RUN-PERIOD RETURNS**

Outcome is **bank stock returns**
- High frequency deposit outflows are unavailable (e.g., hourly).
- We also look at Q1:2023 deposit outflows.

A menagerie of complementary tests:
- **CX.** Relate *Twitter preexposure* (*Jan 1 – Feb 15*) to **bank stock losses** (*Mar 1 to Mar 15*).
- **Also, at high frequency:** Hourly within the run & at the tweet level.
OUR FINDINGS

High preexposure to Twitter predicts bank stock losses in the run period.

- 6.6 percentage points more stock losses during the run for top tercile Twitter preexposure.
- By comparison, a sd increase in % uninsured deposits is associated with 4.1 ppt loss.

Social media amplifies classical bank run risk factors

- Twitter preexposure interacts significantly with % uninsured deposits and mark to market losses.
- Also true at higher frequency.

Twitter pre-exposure also relates to outflows of uninsured deposits in Q1:2023.
MECHANISMS

In-Run Twitter conversation was full of run and contagion keywords.
  • Including these in-run tweet activity measures crowds out the preexposure effect.

Tweets started with investors.
  • SIVB is Silicon Valley Bank’s ticker, but SVB is how general users refer to the bank.
  • Retweets of notable pre-run tweets did not pick up before the run.

‘Tech’ Twitter users – likely depositors in SVB – played outsized role.
  • Startup tweets increase during the run, not just for SVB.
  • Startup user tweets have more high frequency market impact.
CONTRIBUTION

Bank runs in the age of social media and digital banking

• Classical bank runs are about communication and contagion.
• We contribute to an understanding of this period of banking distress (Jiang et al 2023; Dreschler et al 2023; Koont et al 2023).

Contagion via social media, not just social networks

• Social networks and contagion are thought to be critical for banking distress (Iyer and Puri 2012).
• Social media is not just a social network, but a platform that coordinates ideas.
• Social media’s widespread reach & two-way communication are distinctive.
DATA AND CONTEXT
DATA

• **Tweet Data** drawn from the **Twitter API**:  
  • 5.4 million cashtagged tweets ($SIVB, $FRC…)
  • Publicly traded banks (SIC 602, 603, 609) from 1/1/2020– 3/14/2023
  • Tweets on general conversations: “Silicon Valley Bank” or “SVB” and “First Republic Bank”
  • User details on 544,888 Twitter users who contributed these tweets

• **Minute-level stock data** from FirstRate.

• **Banking Data.** FDIC and FFIEC.
  • Compute % **Asset Decline** (mark to market) from 2022:Q1 to 2023:Q1 following Jiang et al (2023).
  • Compute % **Uninsured Deposits**, drawing from the FDIC call reports data.
We build textual dictionaries based on “run” and “contagion” ideas & apply it to the run period.

The top-5 banks by “run” exposure well identify banks with notable run discussions.

<table>
<thead>
<tr>
<th></th>
<th>Run</th>
<th>Contagion</th>
<th>Tweets Pre-Run</th>
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<tr>
<td>SIVB</td>
<td>6,528</td>
<td>9,662</td>
<td>1,163</td>
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<tr>
<td>FRC</td>
<td>1,249</td>
<td>1,368</td>
<td>1,257</td>
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<tr>
<td>SI</td>
<td>343</td>
<td>342</td>
<td>20,774</td>
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<tr>
<td>SBNY</td>
<td>260</td>
<td>106</td>
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<td>JPM</td>
<td>206</td>
<td>245</td>
<td>30,063</td>
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<tr>
<td>90th Percentile</td>
<td>3</td>
<td>2</td>
<td>784</td>
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</table>

All these banks are high on Tweets pre-run. **Motivates our exposure strategy.**
CONTEXTUAL EVIDENCE
PRE-RUN VERSUS RUN LANGUAGE

Pre-Run (Jan 1-Feb 15)  Run Period (Mar 8-13)
PRE-RUN TWEETS WERE RARELY RETWEETED DURING THE RUN

(b) Average Number of Run Period Retweets by Original Tweet Date

Jan 18
HIGHLY RETWEETED PRE-RUN TWEETS WERE REDISCOVERED DURING THE RUN

(a) Raging Capital Ventures Tweet on Jan 18, 2023

Silicon Valley Bank $SSIVB reports earnings tomorrow

Investors have rightfully been fixated on $SSIVB’s large exposure to the stressed venture world, with the stock down a lot.

However, dig just a little deeper, and you will find a much bigger set of problems at $SSIVB... 1/10

2:38 PM · Jan 18, 2023 · 3.9M Views

1,163 Retweets 954 Quotes 6,049 Likes 2,735 Bookmarks

(b) Dynamics of Retweets of Raging Capital Ventures Tweet

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(a) WallStreetSilver Tweet about Bank of America on Jan 18, 2023

Lots of reports on Instagram, Tiktok, Reddit of problems at Bank of America. $BAC

Many customers are missing money and not getting answers.

 chilling ...

#bankofamerica

(b) Dynamics of Retweets of Bank of America Tweet
CROSS-SECTIONAL RESULTS
CX REGRESSION EVIDENCE

- Col (1): Consistent with classical factors, % Uninsured predicts **4.1pp** bank stock losses during run.
- Col (2): Top tercile Twitter activity in pre-run period ➔ **6.66pp** more bank stock losses.
Col (1): Consistent with classical factors, % Uninsured predicts 4.1pp bank stock losses during run.

Col (2): Top tercile Twitter activity in pre-run period ⇒ 6.66pp more bank stock losses.

Col (3)-(5): Interaction between preexposure to Twitter and balance sheet health ⇒ more stock losses.

Main effects on balance sheet variables are small and insignificant.

Separately, Twitter pre-exposure predicts more outflows of uninsured deposits in Q1:2023.
Twitter pre-exposure predicts more outflows of deposits in Q1:2023.

Mostly driven by uninsured deposits.

Evidence on outflows is more tentative because this is outflows for the full quarter, not just run period.
HIGHER FREQUENCY
**SIVB vs SVB**
Investor tweets ($SIVB) spike in volume first, followed by more keywords from more general conversations (SVB, Silicon Valley Bank)
Consistent with “tech” users being depositors.
More tweet volume predicts worse bank stock performance at the hourly frequency in the run period.

For “Run Exposed” Banks, Top Tercile of Tweets vs Bottom Two Terciles Holds with or without SIVB in the sample.
Following Bianchi et al. (2023)

We next examine the immediate impact of tweets in and out of the run, examining price change from $[-15\text{min}, -5\text{min}]$ to $[5\text{min}, 15\text{min}]$

Outcome is $\Delta p_i = \text{difference in logged prices} \sim 10\text{minutes}$

$$\Delta p_{it} = p_{i,t+\tau} - p_{i,t-\tau}$$
TWEET-LEVEL TESTS

Even at this timescale, negative sentiment tweets have:

- More 10-min impact during the run – see constant term.

- Outsized negative sentiment impact for tweets that mention contagion or are by tech community.

- Asymmetry: negative sentiment has impact, but not positive sentiment.

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<th>(3)</th>
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<tr>
<td></td>
<td>$\Delta p_{t,t}$</td>
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<td>-0.02</td>
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<td>(0.16)</td>
<td>(0.16)</td>
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<td>VADER Neg(z)</td>
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<td>-1.56***</td>
<td>-2.72</td>
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<td>(0.27)</td>
<td>(0.28)</td>
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<td>Startup Flag</td>
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<td>(1.29)</td>
<td>(10.86)</td>
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<td>VADER Pos(z) × Startup Flag</td>
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<td></td>
<td>(0.82)</td>
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<td>Contagion Tweet</td>
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<td>(14.32)</td>
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</table>
CONCLUSION

What do we learn from studying the first social media induced bank run?

• Twitter communication and coordination have an imprint beyond SVB.
  • Existing run risks are greater in the presence of social media.
  • Social media is distinctive in its virality: broad audience reach can come from anywhere.

• Preexposure to Twitter conversation matters, tweets by startup community members (who are depositors) have more impact, so do contagion conversations.