Investor Attention to Bank Risk During the Spring 2023 Bank Run

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Abstract

We examine how investor perceptions of bank risk evolved during the Spring 2023 bank run by estimating the covariance ("beta") between the excess stock returns of banks and returns on portfolios of banks sorted by their uninsured deposits and unrealized securities losses. We find that the betas increased significantly during the run, but only for some banks, and these increases were more related to publications about banks than to bank fundamentals. Investors' risk perceptions decreased after the Fed's liquidity support. Our results suggest that increases in investor information sensitivity during the bank run were primarily coordinated by public news arrivals and government actions.

Keywords: Bank run, information sensitivity, limited attention, balance sheet beta, uninsured deposits, unrealized losses

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1 Introduction

The bank run that started in March 2023 in the US occurred at an unusually rapid pace, with historically high 1 day deposit withdrawal rates for Silicon Valley Bank (SVB) and Signature Bank of New York (SBNY) (Figure IA.1), suggesting that depositors were surprised. So, how did bank stakeholders process information around the bank run? Perhaps banks' financial health worsened suddenly, as suggested by the fundamentals-based view of crises (Gorton (1988)). However, we find that bank balance sheets deteriorated well before 2023 (Figure 1), consistent with historical patterns (Correia, Luck and Verner (2025), Hirtle and Plosser (2025)). This delayed response might suggest that bank stakeholders do not have an incentive to become informed until the crisis hits (Gorton and Ordoñez (2014), Dang, Gorton and Holmstrom (2018)). Indeed, empirical evidence supports such a regime-shift in the information sensitivity of debt (Brancati and Macchiavelli (2019)). But *how* do investors become sensitized to information? And how do government interventions affect this process? These issues are important to understand how a crisis affects market efficiency and the effectiveness of central bank liquidity support.

Using a novel high-frequency measure of bank balance sheet risk, this paper studies whether stock market investors' perceptions of such risk abruptly increased during the bank run of Spring 2023. Having found that this was so, we next ask whether this shift was triggered by a heightened sensitivity to bank fundamentals. Alternatively, did low fundamentals trigger investors' self-fulfilling beliefs (Morris and Shin (1998), Goldstein and Pauzner (2005))? Specifically, we examine if investors coordinate on public news arrivals (such as news articles on banks) during the run. Finally, we investigate how a new liquidity facility announced by the Federal Reserve to address bank risk affected investor risk perceptions.

To measure the non-diversifiable portion of bank balance sheet risk, we estimate for publicly-traded banks their balance sheet "betas" — the covariance of bank excess stock returns with balance sheet factor returns. These factors are based on long-short portfolios constructed using bank balance sheet characteristics in 2022Q3, such as the asset shares

of uninsured deposits (denoted *UID*) and unrealized losses on securities in held-to-maturity (HTM) and available-for-sale (AFS) accounts (denoted *Losses*) — characteristics widely recognized as being central to the Spring 2023 bank run (see, for example, Acharya, Richardson, Schoenholtz and Tuckman (2023)). We exclude failed and downgraded banks when constructing factors and SVB, SBNY, and Silvergate Bank (SI) from *all* of our analyses, in order to mitigate any mechanical findings. In the regressions, we include the 5 Fama-French factors (Fama and French (2015)), bank fixed effects and controls for banks' idiosyncratic risk. Thus, the betas may be interpreted as measures of systematic bank balance sheet risks.[1]

Figure 2 shows estimates of the UID and $Losses$ factor betas. The estimates are insignificant in January and February of 2023 but positive and significant during the bank run (March 1-May 5), implying that investors were insensitive to these risks before the run but became sensitive to them during the run (Dang et al. (2018)). However, in the cross-section, less than a third of all banks had significantly higher betas during the run and changes in the betas are only weakly correlated with bank fundamentals in 2022Q4. In other words, banks with higher betas were generally not riskier. So *how* did investors select these banks?

We examine the idea that investors may have become risk-sensitive by coordinating on public news arrivals in 2023 to update the betas (Goldstein and Pauzner (2005)). Our measures of news arrivals are: *Pubcount* or daily counts of publications on banks divided by assets (to remove a size effect induced by greater coverage of larger banks) and announcement dates for bank ratings downgrades during the run. We find that *Pubcount* is associated with bank returns positively before the run and negatively during the run, but the share of banks with significant return effects is less than 25% during the run. Thus, news is weakly informative to stock market investors.

Investors may coordinate even on public signals that are uninformative due to higher-order beliefs (Allen, Morris and Shin (2008)). Such media-generated coordination has been

[1]Bank stocks are typically not considered information insensitive (but see Dang, Li and Wang (2022) for a generalization that includes stocks). However, the factor betas capture the portion of bank stock returns that covary with bank deposits or opaque regulatory variables that are plausibly information insensitive in normal times.

found in the context of bank failures (Izumi, Kotidis and Soto (2024)). To examine if changes in the beta are mediated by news, we interact *Pubcount* with the balance sheet factors, and denote the estimated coefficient as the "news beta." The news betas are negative and significant before the run but positive and highly significant during the run. In other words, when a bank was in the news, its stock price co-varied more strongly with the factors, consistent with more investors attending to systematic bank risk on publication days and thereby becoming information-sensitive. The coordination effects are economically significant, as the news beta is at least half of the overall beta. During the run, the incidence of "good news betas" (i.e., publications associated with reduced betas) is sharply lower while "bad news betas" that enhance investors' perception of bank risk become more likely.

Since we find that banks whose ratings are subsequently downgraded, are more likely to have significant "bad news betas", we investigate whether rating announcements also coordinate investor attention. Rating announcements mostly do not impact abnormal returns (consistent with Norden and Weber (2004)); further, we find that the betas mostly increased *before* rating announcements, inconsistent with the latter acting as coordination devices. The daily flow of publications may have been more salient for coordination purposes than the episodic arrivals of rating announcements in a fast-moving information environment.

The weak correlation of belief updatings with bank fundamentals suggest that asset price dynamics may be distorted due to higher-order beliefs (Allen et al. (2008)) or limited attention (Peng and Xiong (2006) and Van Nieuwerburgh and Veldkamp (2010)), inhibiting market efficiency. On the other hand, our results indicate that cross-bank contagion was limited, perhaps due to the lack of prompt updating of bank risk by investors.

Perceptions of bank risk can be affected by government actions during the run, which were unusual in their policy mix and size in Spring 2023 (Metrick and Schmelzing (2024)). We focus on the Federal Reserve's liquidity support, and in particular the novel Bank Term Funding Program (BTFP), announced on March 12, allowing banks to borrow against the *face* (versus market) value of their underwater liquid securities. We find that banks likely

to benefit the most from BTFP (identified as those with higher shares of unrealized losses on their BTFP-eligible collateral in 2022Q4) had lower UID and *Losses* betas after the announcement of the program. For banks in the 90th percentile of collateral losses, the BTFP announcement completely offsets the risk associated with these losses. Subsequently, when banks borrowed from the BTFP, their cash and capital betas also declined. Thus, BTFP substantially mitigated investors' perception of bank risk, suggesting that central bank actions can make bank debt information insensitive (and even *without* creating opacity as suggested by Dang, Gorton and Holmstrom (2020)).

In contrast to the BTFP, borrowings from the traditional discount window (DW) facility occurred against the *market* value of collateral. We find that DW borrowings did not affect bank betas, perhaps because it is stigmatized (Armantier, Ghysels, Sarkar and Shrader (2015)) and its funding was less subsidized as compared to the BTFP. Thus, although DW borrower names are not revealed, creating opacity in this manner (Dang et al. (2020)) was insufficient to make bank debt information insensitive.

Our results are robust to several modifications: adding controls for the liquidity of bank stocks (e.g., the bid-ask spread, turnover and the price impact), broad banking sector risk, expected market volatility, bond market factors (Fama and French (1993)) and inflation expectations; allowing *Pubcount* to react to past returns (if news follows the market); and using alternative identifications of benefits from the BTFP.

Contributions and related literature. We build on the literature that studies the importance of information and communication in bank run dynamics. A number of papers show a sharp increase in the sensitivity of asset *prices* after a macro or regulatory shock. For example, Brancati and Macchiavelli (2019) find that bank CDS prices were more sensitive to information precision, measured by dispersion in analyst forecasts, and more analysts produced bank information during the Great Financial Crisis (GFC) of 2007-2008. We have some similar results: information sensitivity has a kink, there is increased information pro-

duction (as measured by articles on banks) when risk events (such as rating downgrades) occur, and the worst outcomes (i.e. higher factor betas) occur for banks that are actually downgraded. Different from these papers, we focus on the coordination mechanisms that underlie this shift in information sensitivity, accounting for the Fed's liquidity support. Further, we emphasize bank *risk* rather than *returns*, and introduce a new measure of public news (i.e., articles on banks).

Our paper is related to the literature on whether bank runs are more consistent with panics or fundamentals (see the survey by Goldstein (2013)). While the evidence favors the view that depositors run more heavily on banks with worse fundamentals, the global games approach argues that bad fundamentals could trigger agents' self-fulfilling beliefs (Morris and Shin (1998), Goldstein and Pauzner (2005)). Our evidence is partly consistent with this view: more articles were written about more distressed banks. But, we also find that the publication counts are weakly related to bank fundamentals. In other words, fundamentals do not uniquely determine investor expectations of the occurrence of the crisis.

The well-known opacity of banks (Dang, Gorton, Holmstrom and Ordoñez (2017)) have raised questions about the different ways that markets may discipline banks (Morgan (2002)). Different from this literature, we show that stock markets discipline banks mainly when catalyzed by news arrivals. Cookson, Fox, Gil-Bazo, Imbet and Schiller (2023) show that during the SVB run period, banks with higher pre-run Twitter exposure lost more stock market value, and experienced greater deposit outflows during 2023Q1. While our paper also examines how stock prices reflect information arrival, we use news publications and rating announcements instead of Twitter feeds, and study return comovements rather than returns. While Cookson et al. (2023) find that the effect of tweets on returns is unexplained by unrealized losses and uninsured deposits, we show that return comovements are intermediated by news and government actions, shedding light on *how* investors become more information sensitive during a crisis.

We also contribute to the literature on behavioral explanations of inattention showing

that publicity draws attention to neglected firms and risks (Klibanoff, Lamont and Wizman (1998), Huberman and Regev (2001), Barber and Odean (2008) and Barber, Huang, Odean and Schwarz (2022)). While the behavioral literature typically investigates the effect of media attention on returns, we also examine rating announcements and betas. Specifically, we show that *uninformative* news publications influence investor risk perceptions as stock market investors neglect available fundamental information until attention-grabbing public news or government actions spur a collective refocusing on those fundamentals.[2] Interestingly, we do not find that investors over-react (e.g., due to higher-order beliefs as in Allen et al. (2008)). Rather, we show that investor inattention *limits the breadth of contagion*, possibly preventing a more systemic meltdown (while also hampering market efficiency).

Our estimates of balance sheet betas using high-frequency data provide new insights into the evolution of bank risk during the bank run of Spring 2023. Jiang, Matvos, Piskorski and Seru (2023) analyze the interest rate risk of U.S. bank assets. Haddad, Hartman-Glaser and Muir (2023) argue that the exposure of bank values to interest rate risk can be insensitive most of the time but highly responsive when asset losses become salient. Granja (2023) finds that banks with lower capital ratios, higher shares of run-prone uninsured depositors, and greater exposures to interest rate risks were more likely to reclassify securities to HTM during 2021 and 2022. Drechsler, Savov, Schnabl and Wang (2024) show that a run equilibrium is absent at low interest rates but re-appears when rates rise because the deposit franchise comes to dominate the value of the bank. While our examination of uninsured deposits and unrealized losses is common to this literature, our focus on when and how much these balance sheet risks are incorporated into investors' perceptions of bank risk is new.

Our paper is related to research on the informativeness of credit ratings. Inaccurate credit ratings were identified as key contributors to the Great Financial Crisis of 2008 due to conflicts of interest and rating shopping leading to biased ratings (e.g., Skreta and Veldkamp

[2]Research on the rational allocation of attention finds that investors allocate more attention to common, relative to firm-specific, factors (e.g., Barberis and Shleifer (2003), Peng and Xiong (2006) and Kacperczyk, Van Nieuwerburgh and Veldkamp (2014)). We do not examine the relative comovements between common and firm-specific news but instead, address how the factor betas vary in the cross-section and time-series.

(2009)). However, Goldstein and Yang (2019) argue that independent research by rating agencies might reduce price efficiency if it focuses on information that the market is good at aggregating. We find that credit ratings have limited ability to convey new information and fail to coordinate investor attention to risky banks.

While not the main focus of our paper, we also examine bank stock returns mainly to test for the informativeness of risk events. Choi, Goldsmith-Pinkham and Yorulmazer (2023) find that the stock investors anticipated risks of uninsured deposits but not unrealized losses and that mid-sized banks were stressed immediately after the SVB failure. We find that return spillovers mostly affected a limited set of banks flagged by news articles.[3] In contrast to Choi et al. (2023), we examine "beta contagion" rather than "return contagion" and find that the stock market mostly failed to anticipate increased bank risk during the run.

Stakeholders' attention to information on bank risk is likely to improve the disciplining of opaque banks (Morgan (2002) and Granja (2013)). However, bank depositors tend to be "sleepy" (Drechsler et al. (2024)) and other interested parties — such as bondholders (Morgan (2002)), X users (Cookson et al. (2023)), bank supervisors (Gopalan and Granja (2023)) and large depositors (Cipriani, Eisenbach and Kovner (2024) — have varying ability to discipline banks.

The paper is organized as follows. In Section 2, we discuss the data, hypotheses, and methodology. Section 3 examines changes in bank balance sheet betas during the run, Section 4 analyzes whether publications coordinate investor attention, and Section 5 studies how the Fed's liquidity support affects investor risk perceptions. Section 6 concludes. Appendix A has further details on our data and regression specifications; the internet appendices contain robustness checks and additional results not reported in the paper.

[3]Our results are not strictly comparable since we separate pre-crisis (January to February, 2023) and crisis periods while Choi et al. (2023) estimate average effects from February to March 2023.

2 Data, Hypotheses and Methodology

We describe the data in section 2.1 (further details are in appendix A.) Our methodology for defining the different bank groups, and estimating the factor betas are described in section 2.2. Descriptive statistics by bank group are discussed in section 2.3. We develop hypotheses in section 2.4.1 and specify the regressions in section 2.4.2.

2.1 Data

Our sample consists of 282 publicly-traded banks, of which 72 banks were either in the KBW and KRX *indexes* or downgraded in the sample period, and 210 are *non-index* banks excluded from these indexes. As *index* banks and downgraded banks are more visible (e.g., they have more publications; see Table 5), investors may pay more attention to them; alternatively, if index investors are passive, they may be less attentive to the risks of index banks.

We use daily cum-dividend stock returns from the Center for Research in Security Prices (CRSP) database for the period January 3, 2022 to May 5, 2023. The end date of the sample is chosen to occur 2 weeks after the April 21 downgrade announcements, so that we have an adequate sample size for estimating the post-announcement betas. Bank balance sheet data is from the FR Y-9C and Call Reports, and is matched to the stock price data by mapping the ticker symbols to RSSD identifiers. Appendix A.1 details how we do this.

In our analyses, we exclude banks that failed during the *estimation sample*: Silvergate Bank, SVB and SBNY.[4] First Republic Bank (FRC) is also omitted after April 28 (as it failed before the market opened on May 1). We omit failed banks for two reasons. First, we are interested in how investors evaluate the risk of surviving banks during the bank run. Second, the failed banks have limited data. Separately, banks on downgrade watch or downgraded are *excluded when constructing our factors*, as further discussed in section 2.2.2.

Given our focus on investor risk perceptions, we ensure that the factor betas are based on

[4]Silvergate, SVB, and SBNY were all liquidated or failed between March 8 and 12. Silvergate announced its intent to wind down operations and voluntarily liquidate on March 8. SVB and SBNY went into receivership on March 10 and March 12, respectively.

balance sheet data *once they become available to all investors*, which we assume is after the last submission date for Call Reports (about 1 month after the end of the reporting quarter). For example, since the submission deadline for the 2022Q3 Call Report was October 30, 2022, we assume that investors become aware of the 2022Q3 balance sheets starting on October 31, 2022. Table A.1 in the appendix lists the Call Report submission deadlines.

Measures of news arrivals We gather data on two proxy measures of news arrivals: bank publication counts and credit rating announcements during the bank run. Daily counts of publications regarding our sample banks are from Bloomberg NewsHeat and available for the entire sample. We normalize the series by bank assets since larger banks are typically more news-worthy and denote this series as *Pubcount*. Without normalization, publication counts could mainly indicate a size effect. Notably, publications are counted as long as they appear till 11:59 PM on that day. Since after-market-close publications affect returns the following day, we show results using both contemporaneous values and 2-day moving averages of *PubCount*. We further allow for the possibility that *PubCount* responds to returns.

We collect rating information from Moody's Ratings and Assessment Reports Directory[5] and targeted internet searches for news articles between March 1, 2023 and May 5, 2023. We ignore ratings affirmations and upgrades, focusing only on downgrade watches and downgrades as these are most closely related to the bank run.

The first rating announcement occurred on March 14, 2023,[6] when Moody's placed 6 banks on downgrade watch, emphasizing the banks' reliance on uninsured deposit funding and their unrealized losses on AFS and HTM securities.[7] On April 14, Fitch downgraded

[5]See `https://www.moodys.com/reports/ratings-assessments-reports`.

[6]Moody's released the downgrade watch announcement after market close on Monday, March 13. Since we use daily equity data, we treat March 14 as the date of the announcement. One of these banks, INTRUST Financial Corporation, is not publicly traded and thus not in our sample. Another bank in this group, FRC, was subsequently downgraded on March 17 (issuer rating) and again on April 21 (preferred shares). Silvergate, SVB and SBNY were downgraded prior to their failures or liquidation.

[7]For example, when placing Comerica on downgrade, Moody's states that "Today's rating action reflects Comerica's high reliance on more confidence sensitive uninsured deposit funding, its high amount of unrealized losses in its available-for-sale (AFS) securities portfolio ... In addition, if it were to face higher-than-anticipated deposit outflows, the bank could need to sell assets, thus crystallizing unrealized losses on its AFS securities ..." See Comerica downgrade watch notice.

PacWest Bancorp, and S&P downgraded Schwab on April 19. On April 21, Moody's downgraded 11 banks including all those on downgrade watch plus 5 new banks.[8] These announcements cited broad risks to the US banking sector, particularly to large regional banks, such as reduced deposits, higher funding costs, and interest rate losses on fixed-rate assets.[9]

BTFP and Discount Window data. BTfP and DW transactions data are available online at BTFP data and DW data, respectively.

2.2 Methodology

We discuss our methods for forming bank groups (section 2.2.1) and the bank balance sheet risk factors (section 2.2.2).

2.2.1 Formation of Bank Groups

The *event bank* group includes 12 banks mentioned in the two rating announcements in March and April. These and other groups are listed in appendix IA.2.

- The *March Downgrade Watch (DGW)* group includes 5 banks put on downgrade watch on March 14 and later downgraded in April.
- The *April Only DG* group includes 7 more banks that rating agencies downgraded between April 14 and April 21.

In addition, we define non-event index regional banks (or simply "*index regionals*"), and non-event stress-tested banks (henceforth *STBs*) as follows:

- The *index regional* group comprises of 39 banks in the KRX index that were not on DGW in March or downgraded in April.[10]

[8] Another bank downgraded by Moody's on April 21 is not publicly traded.
[9] See, for example, UMB Financial downgrade and Associated Banc-Corp downgrade.
[10] 5 index regional banks were downgraded in April.

- The *STB* group includes 21 large banks that participated in the Federal Reserve stress tests of 2022 and listed in the KBW index after excluding Schwab and US Bancorp, which were downgraded on April 19 and April 21, respectively.

Finally, non-index banks are sorted into two groups: 46 large banks (with total assets of at least $10B) that we call *non-index regionals* based on their size, and 164 *small* banks (with total assets less than $10B).

2.2.2 Bank Balance Sheet Risk Factors

The balance sheet factors are as follows:

- UID, based on uninsured deposits as % of assets
- *Losses*, based on unrealized losses on AFS + HTM securities as % of assets
- *Cash*, based on or cash % as of assets
- *CET1*, based on the CET1 ratio

Uninsured deposits are widely considered to have been a primary source of risk during the 2023 crisis, due in part to the concentration of these deposits among certain sectors and the inability of banks to raise interest rates sufficiently to attract new deposit inflows. A related risk arose from concerns over *unrealized losses* in banks' security holdings, which triggered further outflows of uninsured deposits. While liquidity buffers are supposed to cushion deposit shocks, interest rate increases since 2022 led to unrealized losses on liquid AFS and HTM securities such as Treasuries, adding to financial distress.[11] *Cash depletions* may further contribute to deposit outflows, as when SBNY lost large amounts of cash in 2022 (FDIC (2023)). Indeed, Lee and Sarkar (2023) argue that some banks experienced cash shortages in 2022 as the aggregate amount of bank reserves declined, prompting unusually

[11]We use AFS + HTM losses instead of just HTM losses because banks can (and often do) strategically reclassify AFS securities as HTM (Fuster and Vickery (2023)). Further, for banks with assets of at least $50 billion, Basel III rules require AFS losses to be reflected in CET1.

frequent borrowings (for a non-crisis period) from the Fed's discount window facility. Thus, the bank run in 2023 may have been, in part, a continuation of liquidity concerns due to monetary tightening in 2022. High capital reserves might offset these risk factors.[12]

The factors are constructed as follows. First, we drop event banks since they are likely to have the most extreme returns, and thus potentially lead to a mechanical correlation between their returns and the factor returns. Second, we omit the small non-index banks as they have unique business models and so, including them would introduce additional risk premia unrelated to bank balance sheets. We sort the remaining banks by each of the above variables, using Call Report and FR Y-9C data for 2022Q3, assuming that these reports are available following their last submission dates and form 3 portfolios (High, Medium, Low). Then, we calculate the average portfolio stock returns, weighted by market capitalization, and take the difference between the highest and lowest tercile returns (High − Low). We take the negative of cash and CET1 to have a consistent interpretation across characteristics: on average, greater (High − Low) spreads indicate potentially higher balance sheet risk.

2.3 Descriptive statistics of Bank Balance Sheets in 2022Q3-Q4

Panel A of Table 1 reports the median balance sheet values and excess returns as of 2022Q3 by bank group. Index regional banks had assets close to \$30B, almost twice as large as non-index regionals. Of event banks, the assets of *March DGW* banks were greater than \$80B; by comparison, *April Only DG* banks were of similar size as index regionals, consistent with 5 of 7 banks in this group being regionals. The STBs were the largest with median assets exceeding \$300B while small non-index banks had median assets less than \$4B.

Based on exact p-values[13] from a Wilcoxon test, we find that event bank balance sheets were the riskiest: they had the highest median *Losses* and the lowest median CET1 ratio of all banks; *March DGW* banks also had the highest UID and the lowest cash share. In

[12]The reported *CET1* may overstate the available capital as it does not incorporate unrealized HTM losses. We have constructed a factor based on adjusting CET1 for unrealized losses and found that the (unreported) results are in-between those based on the *Losses* and CET1 factors.

[13]These computations are based on exact conditional inference for contingency tables (Agresti (1992)).

contrast, STBs and small non-index banks had lower UID than other banks; also, STBs (small non-index banks) had the highest cash (CET1) shares. Compared to these banks, the non-downgraded regionals had more UID and less cash, but statistically similar loss shares and more capital than the STBs. In 2022Q4 (Panel B), the relative risk profiles of different groups were similar to those in Q3.

Outside of the event banks, there was not a clear hierarchy of balance sheet riskiness in Fall 2022. In particular, both the large and smaller regionals were more risky than other non-event banks in some dimensions but not in others. Similarly, between-group differences in excess stock returns are mostly insignificant. Thus, market and book values in Fall 2022 did not unambiguously differentiate banks by their riskiness, as we show more formally below.

2.4 Hypotheses and Regression Specifications

We develop hypotheses on the expected changes in the factor betas during the bank run, when news arrives, and following the Fed's liquidity support in section 2.4.1. The regression specifications are in section 2.4.2.

2.4.1 Hypotheses Development

If stock market investors anticipate higher bank risk during the run, then on average the balance sheet betas are expected to be positive and significant even earlier and increase further during the run. If investors are monitoring bank risk, then increases in the betas should be greater for riskier banks.

Hypothesis 1: Crisis effects on beta. (a) In the time series, the factor betas increase significantly in the bank run. (b) In the cross-section, betas of riskier banks increase more.

Inattentive investors may not focus on risky banks, resulting in a weak relation between bank risk and higher betas. If so, publications about banks could coordinate investor actions. The publications may reveal latent risk events, inform investors and significantly affect bank abnormal returns. Further, if they mostly convey negative news during the run (which is

plausible for event banks) then betas are likely to increase on days with more publications. Even stale news may affect the betas if investors have limited attention. As with publications, informative ratings are expected to result in lower abnormal returns and higher betas of event banks on downgrade watch or downgrade announcements.

Hypothesis 2: News informs bank risk and returns. Abnormal returns decrease and betas increase with publications and (for event banks) rating announcements in the bank run.

Due to limited investor attention or higher-order beliefs, even uninformative news may facilitate coordination among investors.[14] When, upon news arrival, investors update their priors on bank risk, the betas change even when returns do not.

Hypothesis 3: News coordinates investor beliefs about bank risk. Upon news arrivals, bank betas increase during the run even if abnormal returns are unaffected.

The Fed's liquidity support during the bank run is expected to reduce investor risk perceptions, provided it is credible (which depends on the program design). However, a strong selection effect (i.e., if the riskiest banks select into the program, as found by (Acharya, Fleming, Hrung and Sarkar (2017)), may result in *increased* risk perceptions of participants.

Hypothesis 4: The Fed's liquidity support and betas. Banks expected to benefit most from the BTFP have higher returns and lower betas when the program was announced, and when they borrowed from it, relative to other banks.

2.4.2 Regression Specifications

In this section, we describe the specifications in *general* form. We modify this form for specific analyses that are described in detail in appendix section A.3.

Regressions to estimate beta To facilitate comparison of beta estimates, we *standardize* all continuous variables to have a mean of zero and a standard deviation of 1. To test

[14]The implication of limited attention for returns is ambiguous. Salience theory argues that extreme returns indicate information salience (see, for example, Bordalo, Gennaioli and Shleifer (2012) and Bordalo, Gennaioli and Shleifer (2022)) but in our application, inclusion in the rating announcements or publications may indicate salience even absent any effect on returns.

hypothesis 1(a), we estimate panel regressions of excess returns of bank i on a factor:

$$\begin{aligned} Y_{i,t} = \alpha_i + \beta_1 Pre_t \times Factor_t + \beta_2 Post_t \times Factor_t \\ + \sum_{j=1}^{5} \delta_j FF_{j,t} + \delta_6 Log(MVE)_{i,t-1} + \gamma Post_t + \epsilon_{it} \end{aligned} \tag{1}$$

where Y is the stock return minus the 3-month Treasury bill rate on day t. *Pre* (*Post*) is a dummy variable equal to 1 for January-February (March 1 - May 5), 2023. Regressors are the balance sheet factor (UID, *Losses*, Cash or CET1), the 5 Fama-French factors, and the (lagged) log of the bank's market value of equity (MVE). α_i is a bank fixed effect. Hypothesis 1(a) states that $\beta_2 > \beta_1$: the sensitivity to the factor increases during the bank run.

Cross-section of betas. To test Hypothesis 1(b) — whether beta changes are related to bank risk — we estimate *by bank* a modified version of regression (1) that drops the *Pre* dummy to avoid reporting Wald statistics comparing β_1 and β_2 for each bank. We report summary statistics of the bank betas and significance of the mean beta. The t-statistics are corrected for heteroskedasticity using the Newey-West procedure. (This correction is made whenever we report means of cross-section estimates).

Cross-Section prediction regressions We estimate cross-section regressions to predict increases in betas during the run with balance sheet values as of 2022q3 or 2022q4:

$$\begin{aligned} Y_{i,F} =& \alpha_{0,F} + \sum_{j=1}^{4} \alpha_{i,j,F} CLV_{i,j,2022q3} \\ &+ \alpha_{5,F} UID_{i,2022q3} + \alpha_{6,F} Losses_{i,2022q3} + \alpha_{7,F} UID_{i,2022q3} \times Losses_{i,2022q3} \\ &+ \alpha_{8,F} \frac{Cash}{Assets}_{i,2022q3} + \alpha_{9,F} CET1_{i,2022q3} + \alpha_{10,F} ERet_{i,2022q3} + \epsilon_{i,F} \end{aligned} \tag{2}$$

where Y_i is an indicator variable equal to 1 if $bank_i$ experienced a significant increase in the beta of factor F during the run, F=UID, *Losses*, Cash, CET1. $CLV_{i,j}$ are the 4 variables

that Correia et al. (2025) found to be significant in predicting bank failures: Asset growth, $\frac{NetIncome}{Assets}$, $\frac{TimeDeposits}{Deposits}$ and the interaction of the last two variables. We then add UID, $Losses$, and the interaction between them. Finally, we include the ratio of cash to assets, CET1, and the average excess returns in the quarter.

Regressions of abnormal returns To assess the informativeness of various events, we estimate, for each bank i, regressions of bank abnormal returns $AR_{i,t}$ on events (e.g., publications, rating and BTFP announcements).

$$AR_{i,t} = \alpha_i + \eta_0 Day0_{i,t} + \gamma_0 Day[1,T]_{i,t} + \epsilon_{it} \tag{3}$$

$AR_{i,t}$ is the residual from regressing bank returns on the 5 Fama-French factors using data for the first 3 quarters of 2022, as described in appendix A.3.1. $Day0$ (Day[1,T]) is a dummy variable equal to 1 on the day of (from the day after to T days after) the event. In some applications, we include lagged returns to account for return reversals.

3 Crisis Effects on Bank Balance Sheet Betas

If investors anticipate rising bank risk then the factor betas will be positive and significant before the bank run. If their risk sensitivity increases during the run, then the betas are expected to increase further. We first examine if the bank betas increased on average during the run, and then characterize the distribution of betas across banks.

Average beta around the bank run To examine whether the betas increased during the bank run, we estimate regression (1) for January 3 to May 5 of 2023. Table 2 and Figure 2 show the results. Before the run, betas of all factors other than cash are insignificant, while the cash beta is positive and significant. During the run, all betas are positive and significant at the 1% level. Except for the cash factor, the betas increase by three to five

times their pre-run values and a Wald test rejects the null that $Factor \times Pre = Factor \times Post$, where *Pre (Post)* equals 1 before (since) March 1. All Fama-French factors except RMW are significant. The lagged bank MVE and the *Post* dummy are negative and significant. The regressions explain about half of the variations in bank excess returns.

To ensure that the betas identify systematic bank balance sheet risk, we further account for changes in systematic macro and market risk and in bank-specific idiosyncratic risk. First, we allow for crisis effects on the Fama-French factors and the bank MVE. Table IB.2 shows that while some of these risks shift significantly post-run, they do not affect the results on the bank betas. Second, we add the liquidity of bank stocks (e.g. the bid-ask spread, turnover and price impact) and allow these to change during the crisis. Second, we add macro and bank-specific controls, including changes in VIX, bond market factors (Fama and French (1993)), and the liquidity of bank stocks (e.g. the bid-ask spread, turnover and price impact). Consistent with theories of adverse selection (CITE), Table IB.3 reports that the bid-ask spread is positively and significantly related to bank excess returns during the bank run but not before; once again, results on the bank betas are qualitatively unchanged. Third, we include the returns on the KBW bank index to allow for the possibility that our factors measure broad banking sector risk instead of specific balance sheet risks. Table IB.4 shows that our results on the factor betas are robust to these additions. Finally, given that post-run changes in the factor betas are similar except for the cash factor (ranging between 0.20 and 0.25), we check whether the long-short portfolios of different factors overlap substantially, but the results in Table IB.5 show that this is not the case. In summary, evidence that the bank factor betas increase after the run is robust to shifts in systematic macro risk and idiosyncratic bank risk, and mechanical effects of factor construction.

Given our use of daily data, do jumps in the factor betas affect our results (Todorov and Bollerslev (2010))? In Figure IB.1, we plot, for a *rolling* window of 39 trading days, the beta coefficients and their 95% confidence intervals from estimating specification (1), but without interactions with the crisis dummy. The first window is from November 4, 2022 to

January 3, 2023 and the last from March 14 to May 5, 2023. The x-axis shows the end dates of the rolling windows. The vertical drop lines indicate the rating downgrade events and the failure of FRC. Jumps in the betas are not evident in Figure IB.1; instead, the betas evolve smoothly with statistically significant increases starting in March 2023 and around event dates.

Cross-section of factor betas While factor loadings are similar on *average*, we next examine if they vary across banks. Do most banks suffer higher betas during the run (*beta contagion*)? If not, which banks suffered higher betas? Figure 3 shows scatter plots of beta estimates of individual banks for the UID and *Losses* factors before the run (horizontal axis) versus during the run (vertical axis). The share of negative betas is lower during the run. Further, more scatters lies *above* the 45-degree line, implying that the betas generally increase during the run. These patterns are more pronounced for event banks (orange dots in left panel) than for STBs. Similar patterns are visible for the CET1 betas, but less so for the cash betas (see Figure IB.2 in the Appendix).

We estimate the specification (A.3) *by bank*. Table 3 reports the mean β and the mean and share of β conditional on being *positive and significant* (in short, "*sigpos* β"). Consider results for the UID factor (Panel A). Consistent with Figure 3, the mean β increases significantly during the run for all banks except STBs (e.g., by 0.29 for event banks versus statistically zero for STBs; see column 5). The same holds for the mean *sigpos* β. For example, comparing columns 3 and 6, the mean *sigpos* β of index banks more than doubles during the run for index and event banks. Significant increases in the β are most likely for event banks and least for STBs as 33% (5%) of event banks (STBs) have significantly higher βs during the run (column 7). Large and small regionals are similarly affected: 18% (22%) of index (non-index) regionals have significantly higher betas during the run (column 7). The bank run affected some banks not considered central to the crisis. In particular, while just 1% of small non-index banks had *sigpos* betas before the bank run (column 4), 32%

experienced significantly higher betas during the run (column 7). These patterns generally hold for all factors except that, for index and non-index regionals, cash betas do not increase during the run (see column 5 of Panel C).

Across factors, 50% or less of event banks have significantly higher betas during the run. Of non-event banks, no more than 32% have significantly higher betas during the run. What distinguished these banks? Did they share common characteristics?

Bank risk in Fall 2022 and beta changes Do beta increases during the run reflect bank risk in Fall 2022? Appendix tables IB.6 (for the UID and *Losses* factors) and IB.7 (for the Cash and CET1 factors) report the median values of balance sheet characteristics in 2022Q3 of banks with significantly higher betas during the run. For every factor, index banks with higher betas during the run have higher median uninsured deposits than other index banks in 2022Q3, and this difference is significant at the 5% level or less based on a Wilcoxon test. For other balance sheet characteristics, however, these differences are mostly insignificant or inconsistent for all banks. For example, non-index regionals with higher *Losses* betas during the run have significantly lower CET1 but also lower *Losses* than other non-index regionals.

Market values and visibility in 2022 also did not generally indicate later stress as banks with higher betas in the run mostly did not have lower average excess returns or higher average *Pubcount* in 2022Q3 (see last 2 columns of Tables IB.6 and IB.7). One exception is that index banks with higher Cash betas had lower excess returns than other index banks. Results are similar for 2022Q4 values, except that index banks with higher UID and *Losses* betas have significantly lower excess returns than other index banks (Tables IB.8 and IB.9).

Next, we provide a multivariate analysis of the predictability of bank risk in 2022 Q3 or Q4 for beta changes during the run by estimating the cross-section regression (2). The results for the UID and the *Losses* betas are shown in Table 4. Considering the UID beta (Panel A), the first column shows results using the specification in Correia et al. (2025) for predicting bank failures. The second column adds the shares of uninsured deposits

and losses and their interaction. No predictor is significant in either column. However, in column 3, after adding the cash share, CET1 and the average excess returns in 2022Q3, $TimeDep \times NetInc$ (interpreted as the interaction of funding and solvency risks) is negative and weakly significant, consistent with Correia et al. (2025). Similar results obtain for the *Losses* beta (Panel B) or the Cash and CET1 betas (Table IB.10 in the appendix). In particular, $TimeDep \times NetInc$ is negative and significant either at the 5% level (for *Losses* and CET1 betas) or at the 10% level (for the cash beta). Of other variables, CET1 and the average excess returns are significant at the 10% level and negatively related to the UID and CET1 betas. The *Event* banks have the highest root mean square error (RMSE) on average for all factors, consistent with the weak association of their beta increases with 2022Q3 balance sheet values.

Figure 4 shows scatter plots of a dummy variable equal to 1 for significant increases in the factor betas during the run against their predicted values from regression (2). For all factors, the scatters are generally far removed from the 45 degree line, with the estimated probability of significantly higher betas rarely exceeding 0.5, indicating the low power of balance sheet and stock return information in 2022Q3 for predicting bank risk in 2023.

When we use the 2022Q4 values of the regressors, none are significant. We also included additional prediction variables found to be relevant for the SVB crisis in the literature (e.g., see Cipriani et al. (2024)), such as Commercial Real Estate (CRE) loans and borrowings from Federal Home Loan Banks (FHLB), but did not find their 2022Q3 values to be predictive.

Discussion Outside of downgraded banks, increases in the factor betas during the run were confined to less than a third of all banks. Moreover, higher betas are weakly associated with balance sheet risk, stock returns, or publications in 2022Q3 or Q4, even for banks downgraded during the run. Although the interaction of funding and solvency risk in 2022Q3 significantly predicts higher betas during the run, the model has weak forecast ability. Did public news arrivals in 2023 focus investor attention to these banks?

4 Public News Arrivals in 2023 and Investor Attention to Bank Risk

In this section, we examine whether investors coordinated on public signals arriving in 2023 to update their risk perceptions, either due to limited attention or higher-order beliefs. Such coordination might explain why the betas of particular banks increased during the run, absent a strong association with balance sheet risk in 2022. Our main proxy for the arrival of public signals is the number of daily news publications for each bank, normalized by assets. While publications may respond to latent risk events, if investors respond to the articles (instead of to the events directly), this is evidence that investors coordinated around them. Publications may also respond to past returns, a concern that we address below. We further examine rating announcements as another source of public news.

Descriptive statistics of abnormal returns and publications. Panel A of Table 5 shows the distribution in 2022Q3 of *Pubcount* (i.e., the publication counts normalized by assets in \$B) times 100. Index banks were typically more visible than their non-index counterparts, with a median count of about 4% versus 0% for non-index banks. Among index banks, the median count is highest at almost 6% for STBs and around 4% for event banks — thus, banks downgraded during the run were not the most news-worthy in 2022Q3. While smaller non-index regionals have a lower median count than the larger index regionals (1.8% versus 2.4%), their mean count was larger (20% versus 9%), implying that some smaller regional banks had high visibility. In 2022Q4 (Panel B), the cross-bank distribution of *Pubcount* is similar to that in 2022Q3.

Figure 5 plots the time series of the *standardized* value of *Pubcount* for different bank groups. It shows considerable daily variation, so that even banks with low *average* media coverage experience periods of relatively intense publicity. Also plotted are bank abnormal returns (the dotted lines), estimated relative to the market model using specifications A.1

and (A.2), and cumulated from January 1, 2023. Through March 8, just before the crisis, *Pubcount* was below-average for all groups while abnormal returns declined moderately for all banks except STBs (which have return gains). *Pubcount* spiked on March 13 for the *March DGW* group to 3.8 SD — to be expected since, although the DGW announcement was made after market close, our measure includes any publications before 11:59 PM. *Pubcount* also increases markedly on March 13 for the *April DG* group to 2 SD. However, neither large nor small regionals experience unusual media interest at this time. Between March 9 and March 13, stock price declines of event banks accelerate to exceed 27%, while other bank group returns fall between 1% and 6%. News then die down until event banks experience another surge of media interest starting on April 17 (the start of the April downgrades) that continue to the end of the sample. News on STBs also spurt briefly at this time, lasting just 4 days. On April 18, large regional banks gain renewed media attention that lasts through the end of the month, while news on smaller regionals also appears but sporadically and with lower intensity. By May 5, cumulated returns are about –50% for *March DGW* banks and –30% for *April Only DG* banks. In contrast, cumulated returns of STBs turned positive by May 5 while that of all other banks decrease to between –15% and –20%. The figure suggests that publication counts are associated with bank risk events during the run while its correlation with returns appears to be weak outside of the event banks.

Publication effects on returns. If publications contain price-relevant information, they should significantly affect banks' abnormal returns with a sign consistent with the news content. Results from estimating specification (A.4) bank-by-bank are shown in of Table 6. Panel A of the table uses the contemporaneous *Pubcount*; Panel B uses the 2-day moving average of *Pubcount* (our preferred specification) to account for a delayed effect of publications on returns. In both panels, *Pubcount* is insignificant for the full sample of banks but is significantly related to abnormal returns of STBs with a *positive* sign before the run (column 2) but a *negative* sign in the run (column 5) — that is, on average publications bear

good news about STBs before the run but bad news in the run. Consistently, more STBs have significantly positive than significantly negative news effects before the run (columns 3 and 4) but the reverse is true during the run (columns 6 and 7). For event banks, the share of negative news effects doubles from 8% (column 4) before the run to 16% (column 7) in the run. In Panel B, *Pubcount* is also significantly related to abnormal returns of small non-index banks with a negative sign before the run (column 2) and a positive sign afterwards (column 5) — the opposite of STBs. The estimates are insignificant for large and small regionals. Overall, significant news effects in the run (whether positive or negative) do not exceed 35% for any bank group. Thus, publications are not informative for most banks.

Do publications respond to past returns? To address this issue, we follow Jordà (2023) and add the 1-period lagged return to the local projection (A.5). Using the 2-day moving average of *Pubcount*, Table IC.2 shows results for h=0 (contemporaneous projection with the lagged return; Panel A) and h=1 (1-period ahead projection with both the lagged *Pubcount* and the lagged return; Panel B). Results are similar to those obtained without using lagged regressors, indicating that they are robust to endogeneity concerns.

Publication effects on betas. As news arrivals can cause variation over time and between banks in the betas, we interact *Pubcount* with the factors in the panel regression (A.6). Table 7 reports the results; estimates for the 5 FF factors, the bank MVE and *Post* are not reported for brevity. Results for the UID factor (Panel A) show that estimates of the news beta (i.e., the coefficient on the $Pubcount \times Factor$ term) are striking different before versus during the run (last 2 rows of the table). For same-day publications (columns 1-2), the news beta is *negative* and significant before the run but *positive* and highly significant during the run, and a Wald test rejects the null that these two estimates are equal. As in Table 2, the stand-alone factor betas are insignificant pre-run and positive and significant during the run. Finally, news does not affect returns *on average*, consistent with the weak cross-section effects reported in Table 6. Similar results obtain for the *Losses* beta (Panel

B of the table), and for the cash and CET1 betas (see Table IC.3 in the Appendix). These results are robust to using the 2-day moving average of *Pubcount* (columns 3-4 of the table) to account for news arrivals after market close.

Why is the news beta negative before the run? Patton and Verardo (2012) find that the CAPM beta increases around earnings announcements and suggests that the increase reflects investors' learning about other firms. To check if our results are specific to the factor betas, we allow the CAPM beta to also vary with *Pubcount* in Table IC.4 and find that, in our preferred specification MA2, the post-run CAPM beta increases on or after publication-day, consistent with Patton and Verardo (2012) but the pre-run CAPM beta *decreases* with *Pubcount* in *all* specifications, similar to the factor betas. Our results might suggest a tradeoff between investors' capacity to learn (which tend to increase beta) and to pay attention (which may decrease beta if investors pay *less* attention to banks *not* in the news).[15] When the value of learning is high, as in a crisis, the first effect dominates; conversely, the second effect dominates before the run when the value of learning is low.

We conclude that news arrivals mediate investor recognition of greater bank risk, making them more information sensitive during the run (Dang et al. (2018)). They may do so by facilitating coordination among investors when updating their estimates of bank risk, rather than by providing fresh information on bank risk (as suggested by the weak effects of news on returns). The coordination effect is economically significant — for example, the news beta is typically the same as or higher than the stand-alone factor beta. It is also long-lasting and persistent since the news betas remain significant up to at least 3 days after publications (last 2 columns of the table), consistent with the limited attention capacity of investors.

Cross-section of news betas The cross-section of news betas is informative of news content. In particular, for banks with weak balance sheets, there is much to learn about

[15]This is an example of "attention externality" (Bordalo et al. (2022)). A choice set that renders a good's attribute more salient causes the decision maker to attach a higher weight to the good's attribute in that choice set, and to attach a *lower* weight to attributes that, in the same choice set, are not salient (Natenzon (2019), Bordalo et al. (2012)).

balance sheet risk from publications about them, implying positive news betas. Conversely, for banks with safer balance sheets, like the STBs, the value of learning about balance sheet risk is small, implying smaller news betas.

Figure 6 shows scatter plots of the UID and *Losses* news betas pre-run (x-axis) versus during the run (y-axis) for index (left panel) and non-index (right panel) banks, using the 2-day moving average $PubcountMA2$. Estimates for downgraded (left panel) and non-index regional banks (right panel) are shaded orange. The scatters are concentrated in the upper left quadrant, indicating that many banks had negative news betas before the run (news associated with lower betas) but positive news betas during the run (news associated with higher betas). Also, more scatters are above the 45 degree line than below in this quadrant, implying that the positive news betas during the run are at least as large as the (absolute value) of pre-run news betas. Results for the cash and CET1 betas are similar (Figure IC.1).

We estimate specification (A.7) by bank. In Table 8, we characterize the distributions of *significant* news and factor betas for the UID and *Losses* factors, separately for positive and negative estimates. Consider the UID factor (Panel A). Upon news arrivals, betas are more likely to increase than decrease during the run, as compared to before the run. For example, the share of significantly *negative* news betas for all index and event (non-index) banks is 26% (25%) before the run (column 4) but just 10% (10%) have significantly *lower betas* during the run (column 8). In contrast, 18% (15%) of all index and event (non-index) banks have significantly *positive news* betas before the run (column 2) and 22% (21%) of banks have significantly *higher* betas during the run (column 6). Also, after conditioning on significant estimates, the news betas are larger during the run, as can be seen by comparing columns 3 and 7 or columns 5 and 9. For example, the average beta (conditional on being significantly positive) is 0.59 (0.70) for all index and event (non-index) banks before the run (column 3) but 0.73 (0.86) in the run (column 7). These results mostly hold for the *Losses* (Panel B), cash (Panel C) and CET1 (Panel D) factors, with some exceptions. For example, for the *Losses* beta, news betas of STBs and index regionals are more likely to decrease

than increase in the run (columns 6 and 8, Panel B). Thus, investors' perceptions of bank risk are closely tied to news arrivals during the run. Factor betas are less likely to *decline* significantly with news but are moderately likely to *increase* significantly.

Changes in news betas and bank risk in 2022 Did banks with significantly positive news betas during the run have greater balance sheet risk, or lower average excess returns, or higher average *Pubcount*, in 2022Q3? The answer, as reported in Tables IC.5 and IC.6 in the appendix, indicates "No" in most cases. This evidence reinforces the interpretation of news as coordination devices. Indeed, if publications instead reflect risk events, this would imply more significant responses to or associations with returns, contrary to our results.

Did rating announcements coordinate investor attention to bank risk? The strong effect of publications on event bank betas raises the possibility that rating announcements also coordinated investor attention. The following is a summary of the analysis; more detailed results are in appendix section ID. We first show that neither the March nor the April announcements were informative to stock market investors (see Table ID.2). If ratings announcements nevertheless act as coordination devices for investors, then the betas of event banks should only change after announcements and not before. We estimate betas around rating announcements relative to January-February 2023 (the reference period) and plot them in Figure 7 (for the UID and *Losses* factors) and Figure ID.2 (for the $Cash$ and $CET1$ factors). For the UID factor, the mean β increases for all banks in the *pre-announcement* period of March 1-13, ranging from 0.02 (for index regionals) to 0.62 (for *March DGW* banks). After the March announcements, we find no further increases in the mean betas — and sometimes decreases, as with the *March DGW* banks. After the April announcements, the betas increase for the *April Only DG* banks relative to the pre-announcement period, and the share of positive betas also increases (see Table ID.3). These results hold for the factors as well, and are consistent with investors coordinating on the April but not the March announcements. However, the announcement of the Fed's BTFP

on March 12 may have mitigated investor risk perceptions, an issue we examine next.

5 The Fed's Liquidity Support and Investor Attention to Bank Risk

Investors' perception of bank risk may be affected by expectations of government support during the run. In this section, we consider two liquidity support programs by the Fed: the BTFP and the DW. The BTFP allowed banks to obtain subsidized funding against their underwater liquid securities, and was frequently mentioned by rating agencies in their risk assessments.[16] The DW is a long-established program that provides short-term funds against the market value of a wide range of collateral. We examine how the announcement of the BTFP, and bank borrowings from the BTFP and the DW, affected bank betas.

Was the BTFP announcement informative? Under the BTFP, banks could borrow against the full face value of securities with a maturity of up to one year that are eligible for purchase by the Federal Reserve Banks in open market operations (OMO), such as U.S. Treasuries, U.S. agency securities, and U.S. agency mortgage-backed securities.[17] We use the asset shares of OMO securities, and unrealized losses on these securities, as of 2022Q4 to identify BTFP announcement effects. Banks with higher pre-existing OMO shares could borrow more from the BTFP, given that they needed to own the OMO collateral as of March 12, 2023. Further, banks with more unrealized losses on these securities benefited more from borrowing since they were pledgeable to the BTFP at par.

Panel A of Table 9 shows the distribution of asset shares of unrealized losses on OMO securities in 2022Q4 by bank group. The median OMO loss share is between 0.9% and 2.5%, with the *April Only DG* banks having the highest shares and small non-index banks the

[16]For example, Moody's stated that "While Moody's expects US banks will continue to benefit from Federal Reserve liquidity backstops and Federal Home Loan Bank system funding, these funding sources come at a greater cost and also in most cases have shorter duration than core deposits"(Western Alliance).

[17]See BTFP announcement.

lowest. Notably, large and small regional banks had similar shares of OMO losses. These loss shares are somewhat lower than in 2022Q3 (see appendix Table IE.1). The median OMO securities share (Panel B of the table) is between 8% and 21% with event banks having the highest shares and small non-index banks the lowest. In both panels, index banks typically had higher median shares than non-index banks.

We estimate the effect of the BTFP announcement on abnormal returns for the week of March 13-17, and the following week. Given that March 13 is the height of the crisis, topping 3 days of negative returns, mean reversion may lead to a positive announcement effect.[18] To account for this, we use 3 lags of returns (see specification (A.10). Panel A of Table 10 reports summary statistics from estimating (A.10) by bank. As expected, average returns are negative for most groups, but they are even more negative for banks with low levels of OMO losses. For example, column 1 (4) reports that event banks with high (low) OMO losses have average returns of -3.40% (-12.05%), a difference of 8.65% in the announcement week (column 7), although this difference is insignificant. However, cumulated over the first 2 weeks after the announcement, event banks with high OMO losses obtained a return premium of 8.06%, which is significant at the 5% level of confidence (column 8). As their average OMO loss share was 2.2 (see Table 9), the average OMO return premium is almost 18% for event banks in the first 2 weeks after the BTFP announcement.[19] As event banks had the highest average OMO loss share, they were expected to benefit most from the BTFP. Small non-index banks had the lowest OMO loss share and their high-low spread is small and insignificant over 2 weeks. STBs had above-average levels of OMO losses but their cumulated 2-week OMO return premium is insignificant, possibly because they experienced rapid deposit inflows at this time (Caglio, Dlugosz and Rezende (2024)) and had little need to borrow. Index and small regionals had average OMO loss shares and their return premium is also small and insignificant. Indeed, among regional banks, those with assets between $100B

[18]Results are qualitatively similar, but with weaker significance, if we exclude lagged returns.

[19]To get the OMO loss share of event banks, we average the mean OMO loss shares of *April Only DG* and *March DGW* banks from Panel A of Table 9.

and $250B borrowed most from the BTFP (Glancy and Zlate (2024)) whereas the median assets of index regional banks was less than $30B.

Panel B of the table shows results using a placebo announcement week of February 13-17, 2023. We find that, compared to the announcement period, the high-low spread for event banks, cumulated over 2 weeks, is tiny (0.3%; see column 8) and insignificant. We conclude that investors expected the benefits of the BTFP to mostly accrue to the event banks.

Appendix table IE.2 shows that the results are similar using the asset share of the *quantity* of OMO securities as of 2022Q4 to identify the effects of the BTFP announcement. For event banks, the high-low spread is more than 6% (or an OMO premium of about 14%) in the announcement week and 5% when cumulated over 2 weeks (or an OMO premium of 11%); however, these premia are not statistically significant. By comparison, the high-low spread for other bank groups is less than 1% and mostly insignificant.

The BTFP announcement and bank betas Given the design of the BTFP, we expect a direct effect on investors' perceptions of risks related to unrealized losses. In addition, risks related to cash may be lowered due to borrowing, as well as those related to capital if the losses are ultimately capitalized. Finally, uninsured depositors may become less concerned about bank failure, thereby reducing UID risk.

We estimate (A.11) as a panel regression for the period February 27-March 24. Panel A of Table 11 reports results when using the log of OMO losses in 2022Q4 to identify the BTFP announcement effects. *Post* equals 1 during the BTFP announcement period of March 13-24. For the UID factor, if OMO losses increase by 1 log unit, then the beta *increases* on average by 0.09 before the BTFP announcement but *decreases* by 0.08 afterwards – i.e., the announcement almost fully offsets the effect of greater OMO losses on the betas. For a bank with median (90th percentile of) log OMO losses, the beta is lower by 0.02 (0.09). For the *Losses* factor, there is a significant decrease in beta during the post-BTFP announcement period, but this is not related to OMO losses. There is no evidence that

the BTFP announcement reduced the cash and CET1 betas. Results are similar for the UID factor when using the log of OMO holdings in 2022Q4 (Panel B). Thus, the UID beta decreases more after the BTFP announcement for banks with greater OMO losses or quantities. While reductions in the *Losses* beta are unrelated to OMO losses *on average*, they may be related for some banks — and event banks, in particular, given results on how the BTFP announcement affected returns.

To examine how the BTFP announcement affected the cross-section of betas, we estimate equation (A.12) for each bank and obtain the post-BTFP announcement beta. Then we compare the mean of the announcement beta for banks with above-median ($High$) versus below-median (Low) levels of OMO losses as of 2022Q4. Table 12 reports summary statistics of the differences in the post-announcement betas between the $High$ and Low groups. Consider first results for the UID beta (Panel A). The first column shows that small non-index banks make up most of the Low group while event banks are mostly in the $High$ group. The second column shows that, *within* each group, the UID beta is lower for the $High$ group for all banks except the index regionals. Focusing on betas that are significant at the 5% level of confidence (last 2 columns), we find that banks in the *High* group typically have larger (smaller) shares of significantly negative (positive) changes in their β, as compared to the Low group.[20] These results indicate lower UID risk perceptions for most banks with higher OMO losses. There is also evidence of reduced risk perception regarding *Losses* risk for event banks, STBs and index regionals. For example, for the *Losses* beta (Panel B), index regionals in the $High$ group have a lower post-announcement β and greater (lower) shares of significantly negative (positive) changes in their β, as compared to those in the Low group. Event banks also have lower post-announcement cash and CET1 βs while index regionals have lower post-announcement cash betas.

When we sort the banks into high and low groups based on the share of OMO quantities,

[20]Event banks are exceptions in that those in the *Low* group are more likely to have both lower and higher post-announcement βs, but the first effect dominates so that, overall, event banks have lower βs in the post-BTFP announcement period.

the results are similar (see appendix Table IE.3). Thus, after the BTFP announcement, investors' perception of risks from UID and unrealized losses decreased for most banks, while that of cash and CET1 risk remained largely unchanged except for event banks.

Borrowings from BTFP and bank betas Although the BTFP borrowings were anonymous, it may have been inferred, similarly to the DW borrowings. However, given the significant announcement effects, actual borrowings may be largely anticipated. To mitigate this concern, we consider changes in betas after the *first time* a bank borrows from the BTFP and, further, we ignore borrowing after March. 34 banks in our sample borrowed from the BTFP in March. Given the small sample size and anticipation by investors, we may expect the effects on the bank betas to be weak. In addition, investors may view BTFP borrowings as adverse signals about borrowers, offsetting any positive effects on the betas.

Panel A of Table 13 shows results from a panel regression of bank borrowings on factor betas in the 10-days after the first BTFP borrowing in March, relative to the 10-days prior. Non-borrowing banks are assumed to have a borrowing date of March 13, the announcement date of the program. We find a reduction in the cash and CET1 factor betas after BTFP borrowings, perhaps indicating reduced concerns about funding and capital risk after cash inflows from the borrowings, and complementing the mitigation of UID and $Losses$ risk after the program announcement. Overall, the results indicate a comprehensive reduction in investor risk perceptions following the implementation of the program.

Borrowings from the Discount Window and bank betas. Panel B of Table 13 shows results from a panel regression of bank borrowings on factor betas in the 10-days after the first DW borrowing, relative to the 10-days prior. 38 banks in our sample borrowed from the DW in March 2023. All of the beta estimates are insignificant, with no consistency in signs. Thus, unlike with the BTFP, we find no evidence that investors viewed DW borrowings as risk-reducing. Since banks borrow at the DW against the market value of collateral, such borrowings are not subsidized, whereas, as we previously showed, the benefits of the BTFP

are significantly associated with the size of the subsidy (i.e., the OMO losses). In addition, the well-known stigmatization of DW borrowings may have contributed to investors' perceptions of banks' participation in the DW.

6 Conclusion

We study how investors' perceptions of bank risk evolved during the Spring 2023 bank run to understand whether the stock market disciplines risky banks. To measure bank risk, we estimate balance sheet "betas"— the covariance of bank excess stock returns with returns on factors constructed from long-short portfolios based on bank balance sheet characteristics, such as the asset shares of uninsured deposits (UID) or unrealized losses ($Losses$) on AFS and HTM securities, in 2022Q3.

Even after accounting for standard asset pricing factors, we find that the balance sheet betas were insignificant in January and February of 2023 but became positive and significant during the bank run. In the cross section, we find that the betas increased significantly for only a few banks and these increases were weakly correlated with bank risk in 2022.

How, then, did investors become information-sensitive? We examine whether the public information arrivals allowed investors to coordinate their actions, either due to higher-order beliefs or due to limited attention. We show that even though $Pubcount$ (bank publication counts divided by assets) has weak correlation with bank returns, news betas (or the component of betas that vary with $Pubcount$) are insignificant pre-run but become positive and highly significant during the run. These effects are long-lasting and persistent, consistent with the idea that publications facilitate coordination among investors when they update their priors on bank risk. Unlike $Pubcount$, rating announcements mostly did not coordinate investor actions, perhaps due to their episodic nature.

The limited ability of investors to process information during a bank run potentially makes price dynamics noisier, to the detriment of market participants and policymakers.

However, limited attention also contained contagion to the banking sector as few banks were affected, although this effect is difficult to disentangle from the effects of government support. Indeed, we show that the Fed's liquidity support had a significant effect in reducing risk perceptions of banks most likely to benefit from the program. Overall, our results show how information sensitivity is shaped by media and government policy.

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Table 1: **Bank Balance Sheets: 2022Q3 and 2022Q4**

Panel A: 2022Q3							
Bank Group	Number	Assets	Unins. Dep.	Losses	Cash	CET1	Excess Ret.
		$B	% of Assets	% of Assets	% of Assets	%	%
All Index and Event Banks	72	44.07	36.88	2.61	4.22	10.99	-0.03
April Only DG	7	38.05	37.76	3.34	3.82	9.86	0.01
March DGW	5	84.34	57.45	3.68	2.70	9.61	-0.10
Index Regional	39	27.08	34.91	2.52	3.18	11.73	0.05
STBs	21	303.57	34.23	2.37	8.37	10.33	-0.16
All Non-index banks	210	5.06	32.32	2.16	3.21	12.07	-0.04
Non-Index Regional	46	15.89	38.74	2.11	2.77	11.31	-0.01
Small Non-Index	164	3.69	30.39	2.17	3.42	12.28	-0.05
Panel B: 2022Q4							
Bank Group	Number	Assets	Unins. Dep.	Losses	Cash	CET1	Excess Ret.
		$B	% of Assets	% of Assets	% of Assets	%	%
All Index and Event Banks	72	45.34	35.25	2.41	3.92	10.94	0.06
April Only DG	7	39.41	39.44	2.88	2.98	9.92	0.07
March DGW	5	85.65	56.24	2.46	2.23	9.65	-0.17
Index Regional	39	27.66	34.77	2.47	3.05	11.69	0.06
STBs	21	301.45	31.70	2.23	7.99	10.60	0.09
All Non-index banks	210	5.09	30.39	1.92	2.41	12.09	0.02
Non-Index Regional	46	15.67	36.93	1.85	2.45	11.40	0.05
Small Non-Index	164	3.75	29.38	1.93	2.39	12.26	-0.01

Note: The table shows the median of balance sheet values and excess stock returns as of 2022Q3 and 2022Q4. *Index* (*Non-index*) are publicly-traded banks included (not included) in the KBW or KRX indexes. The *March DGW* and the *April Only DG Banks* groups include banks downgraded in April, 2023, with banks in the former group also put on downgrade watch in March, 2023. The *index regional* (STB) group consists of non-downgraded regional (US stress-tested) index banks. Non-index regional banks have assets of at least $10B. *Losses* are differences between par and fair values of AFS and HTM securities. *DGW*=Downgrade Watch. *Unin.Dep.* = Uninsured Deposits. *Ret.* = stock returns.

Table 2: **Bank Balance Sheet Factor Betas: Before and During the Bank Run**

	Factor=UID		Factor=Losses		Factor=Cash		Factor=CET1	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Factor*Pre	-0.01	0.07	0.02	0.06	0.15**	0.06	-0.01	0.07
Factor*Post	0.20***	0.04	0.21***	0.03	0.25***	0.05	0.22***	0.04
Mkt-Rf	0.35***	0.03	0.37***	0.03	0.34***	0.03	0.36***	0.04
SMB	0.18***	0.04	0.18***	0.04	0.16***	0.03	0.18***	0.04
HML	0.34***	0.06	0.33***	0.04	0.35***	0.05	0.31***	0.06
RMW	0.05	0.04	0.04	0.04	0.00	0.04	0.05	0.04
CMA	-0.19***	0.06	-0.15***	0.05	-0.15**	0.06	-0.16***	0.06
Log Bank MVE_Lag1	-0.09***	0.04	-0.09***	0.03	-0.11***	0.03	-0.09**	0.04
Post	-0.20***	0.07	-0.22***	0.07	-0.22***	0.06	-0.21***	0.08
Wald Test: Factor*Pre=Factor*Post								
P-value	0.00		0.01		0.13		0.01	
Obs	24134		24134		24134		24134	
Adj R2	0.49		0.49		0.50		0.49	
Bank FE	YES		YES		YES		YES	

Note: This table shows results from estimating the following panel regression from January 3 to May 5, 2023:

$$Y_{i,t} = \alpha_0 + \alpha_i + \beta_1 Pre_t \times Factor_t + \beta_2 Post_t \times Factor_t + \sum_{j=1}^{5} \delta_j FF_{j,t} + \delta_6 Log(MVE)_{i,t-1} + \gamma Post_t + \epsilon_{it}$$

Y is the bank's excess returns. The dummy variables *Pre* (*Post*) equal 1 before (since) March 1, 2023. The factors are constructed from long-short portfolios based on 2022Q3 asset shares of uninsured deposits (UID), unrealized losses on AFS and HTM securities (*Losses*), cash as shares of assets, and the common equity tier one ratio CET1. The *negative* of the cash and CET1 factor returns is used for consistency with the other factors. Downgraded and failed banks are excluded from the factor construction; the latter also dropped from the sample. All variables are standardized to have mean zero and unit standard deviation. Standard errors are robust and clustered by date. Stars represent statistical significance: $^*p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table 3: **Cross-Section of Bank Balance Sheet Betas: Before and During the Bank Run**

	N	Avg ß$_1$	ß$_1$ >0 & p<=0.05	% ß$_1$ >0 & p<=0.05	Avg ß$_2$	ß$_2$ >0 & p<=0.05	% ß$_2$ >0 & p<=0.05
Panel A: Factor=UID							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
All Index and Event Banks	72	0.05	0.35	8.33	0.14***	0.42	16.67
Event Banks	12	-0.01		0.00	0.29***	0.44	33.33
STBs	21	0.00	0.41	9.52	0.07	0.94	4.76
Index Regionals	39	0.09**	0.33	10.26	0.13***	0.34	17.95
All Nonindex Banks	210	-0.02	0.36	3.33	0.23***	0.49	29.52
Non-Index Regionals	46	0.02	0.38	10.87	0.18***	0.53	21.74
Small Non-Index	164	-0.03*	0.31	1.22	0.24***	0.49	31.71
Panel B: Factor=Losses							
	N	Avg ß$_1$	ß$_1$ >0 & p<=0.05	% ß$_1$ >0 & p<=0.05	Avg ß$_2$	ß$_2$ >0 & p<=0.05	% ß$_2$ >0 & p<=0.05
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
All Index and Event Banks	72	0.06**	0.27	8.33	0.11***	0.36	13.89
Event Banks	12	-0.01		0.00	0.23***	0.36	41.67
STBs	21	0.01	0.26	14.29	0.04		0.00
Index Regionals	39	0.10***	0.29	7.69	0.12***	0.36	12.82
All Nonindex Banks	210	0.01	0.35	6.19	0.21***	0.49	23.81
Non-Index Regionals	46	0.05	0.35	15.22	0.16***	0.43	17.39
Small Non-Index	164	0.00	0.34	3.66	0.22***	0.50	25.61
Panel C: Factor=Cash							
	N	Avg ß$_1$	ß$_1$ >0 & p<=0.05	% ß$_1$ >0 & p<=0.05	Avg ß$_2$	ß$_2$ >0 & p<=0.05	% ß$_2$ >0 & p<=0.05
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
All Index and Event Banks	72	0.09***	0.37	33.33	0.09***	0.33	16.67
Event Banks	12	0.01	0.27	16.67	0.23***	0.36	50.00
STBs	21	-0.20***		0.00	0.18***	0.37	14.29
Index Regionals	39	0.28***	0.37	56.41	0.00	0.25	7.69
All Nonindex Banks	210	0.16***	0.40	24.76	0.11***	0.35	15.24
Non-Index Regionals	46	0.20***	0.44	34.78	0.06*	0.38	15.22
Small Non-Index	164	0.15***	0.38	21.95	0.12***	0.35	15.24
Panel D: Factor=CET1							
	N	Avg ß$_1$	ß$_1$ >0 & p<=0.05	% ß$_1$ >0 & p<=0.05	Avg ß$_2$	ß$_2$ >0 & p<=0.05	% ß$_2$ >0 & p<=0.05
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
All Index and Event Banks	72	0.09**	0.43	19.44	0.12***	0.45	22.22
Event Banks	12	0.00	0.25	16.67	0.28***	0.44	41.67
STBs	21	0.19**	0.55	28.57	-0.10	0.50	4.76
Index Regionals	39	0.06	0.38	15.38	0.19***	0.45	25.64
All Nonindex Banks	210	-0.05***	0.36	2.86	0.27***	0.50	30.95
Non-Index Regionals	46	0.01	0.42	2.17	0.20***	0.45	26.09
Small Non-Index	164	-0.07***	0.35	3.05	0.28***	0.51	32.32

Note: The table summarizes results of estimating the following equation by bank i from January 1 to May 5, 2023.

$$Y_{i,t} = \alpha_i + \beta_{i,1} Factor_t + \beta_{i,2} Post_t \times Factor_t + \sum_{j=1}^{5} \delta_{i,j} FF_{j,t} + \delta_{i,6} Log(MVE)_{i,t-1} + \gamma_i Post_t + \epsilon_{it}$$

Y is the bank's excess returns. *Post* equals 1 from March 1, 2023. The factors are constructed from long-short portfolios based on asset shares in 2022Q3 of uninsured deposits (UID), unrealized losses on AFS and HTM securities (*Losses*), and cash as well as CET1. We show the means of β_1 and β_2, unconditionally and conditional on the betas being positive and significant, and also the share of banks with positive and significant betas. All variables in the regression are standardized to have mean zero and unit standard deviation. *Index* (*Non-index*) are publicly-traded banks included (not included) in the KBW or KRX indexes. *Event banks* were downgraded in April 2023. The *index regional* (STB) group consists of non-downgraded regional (US stress-tested) index banks. Non-Index *regional* (*small*) banks have more than (less than or equal to) $10B in total assets. Stars represent statistical significance based on Newey-West standard errors: *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Table 4: **Predicting Increases in Balance Sheet Betas During the Run**

Panel A: UID Beta						
2022Q3 Values of:	Estimate	SE	Estimate	SE	Estimate	SE
Asset Growth	0.07	0.15	0.08	0.15	0.11	0.19
Net Income	0.27	0.28	0.32	0.30	0.38	0.38
Time Deposits	0.33	0.61	0.60	0.69	1.36	0.97
Net Income*Time Deposits	-2.01	1.49	-2.51	1.66	-4.13*	2.28
UID			-0.06	0.33	0.21	0.44
Losses			-4.14	4.46	8.65	6.42
UID*Losses			0.12	0.13	-0.10	0.18
Cash/Assets					0.01	0.01
Average Excess Returns					-0.25	0.22
CET1					-0.02*	0.01
Intercept	0.13	0.09	0.12	0.15	0.07	0.23
Obs	282		282		282	
Adj R2	-0.01		-0.01		0.02	
Root MSE, All Banks	0.39		0.39		0.43	
Root MSE, Event Banks	0.49		0.47		0.59	
Root MSE, STBs	0.20		0.19		0.35	
Root MSE, Index Regional Banks	0.34		0.33		0.45	
Root MSE, Non-Index Regional Banks	0.38		0.38		0.36	
Root MSE, Small Non-Index Banks	0.42		0.42		0.42	
Panel B: Losses Beta						
2022Q3 Values of:	Estimate	SE	Estimate	SE	Estimate	SE
Asset Growth	0.04	0.13	0.01	0.13	0.08	0.18
Net Income	0.10	0.28	0.12	0.28	0.65	0.40
Time Deposits	-0.24	0.52	-0.03	0.53	1.49	0.97
Net Income*Time Deposits	-0.20	1.72	-0.56	1.77	-4.54**	2.19
UID			0.31	0.33	-0.28	0.39
Losses			-1.49	3.91	-4.32	6.23
UID*Losses			0.02	0.11	0.20	0.17
Cash/Assets					0.01	0.01
Average Excess Returns					-0.33	0.22
CET1					-0.01	0.01
Intercept	0.16*	0.09	0.07	0.14	0.08	0.19
Obs	282		282		282	
Adj R2	-0.01		-0.01		0.01	
Root MSE, All Banks	0.38		0.38		0.40	
Root MSE, Event Banks	0.49		0.47		0.51	
Root MSE, STBs	0.18		0.18		0.32	
Root MSE, Index Regional Banks	0.25		0.25		0.35	
Root MSE, Non-Index Regional Banks	0.38		0.37		0.41	
Root MSE, Small Non-Index Banks	0.40		0.40		0.39	

Note: The table shows results from a cross-section regression:

$$Y_{i,F} = \alpha_{0,F} + \sum_{j=1}^{10} \alpha_{i,j,F} X_{i,j,2022q3} + \epsilon_{i,F}$$

Y_i=1 if $bank_i$ experienced a significant increase in its factor beta F during the run, where F=UID (Panel A) or *Losses* (Panel B). $X_{i,j}$ are measured as of 2022Q3 and include: asset growth, asset shares of net income, deposits, cash and uninsured deposits UID, the share time deposits in total deposits, *Losses*, CET1, and average excess stock returns. *Losses* are differences between par and fair values of AFS and HTM securities. *Index* (*Non-index*) are publicly-traded banks included (not included) in the KBW or KRX indexes. *Event banks* were downgraded in April 2023. The *index regional* (STB) group consists of non-downgraded regional (US stress-tested) index banks. Non-Index *regional* (*small*) banks have more than (less than or equal to) $10B in total assets. We report heteroscedasticity-consistent standard errors (SE) based on MacKinnon and White (1985). ***(**)* indicate statistical significance at the 1%(5%)10% level.

Table 5: **Bank Publication Counts: Descriptive Statistics**

Panel A: 2022Q3							
Bank Group	Number	Mean	Min	P25	P50	P75	Max
All Index and Event Banks	72	9.84	0.00	0.00	3.81	9.86	755.98
April Only DG	7	13.59	0.00	0.00	4.32	14.49	580.82
March DGW	5	6.75	0.00	1.45	3.39	6.95	106.44
STBs	21	10.53	0.00	3.17	5.78	14.14	269.41
Index Regional Banks	39	9.19	0.00	0.00	2.44	7.48	755.98
All Non-Index Banks	210	33.87	0.00	0.00	0.00	15.81	8459.63
Non-Index Regional Banks	46	20.35	0.00	0.00	1.79	14.29	893.79
Small Non-Index Banks	164	37.68	0.00	0.00	0.00	16.67	8459.63
Panel B: 2022Q4							
Bank Group	Number	Mean	Min	P25	P50	P75	Max
All Index and Event Banks	72	10.14	0.00	0.00	3.86	10.65	316.14
April Only DG	7	14.60	0.00	2.37	5.62	13.85	288.89
March DGW	5	7.28	0.00	1.41	2.95	7.79	101.27
STBs	21	10.26	0.00	2.65	5.83	13.55	269.32
Index Regional Banks	39	9.64	0.00	0.00	2.65	8.52	316.14
All Non-Index Banks	210	37.77	0.00	0.00	0.00	20.06	6583.93
Non-Index Regional Banks	46	19.79	0.00	0.00	2.53	15.36	593.68
Small Non-Index Banks	164	42.81	0.00	0.00	0.00	24.04	6583.93

Note: The table shows the distribution of 100*publication counts, normalized by assets in $B, in 2022Q3 (Panel A) and 2022Q4 (Panel B). *Index* banks are part of the KBW or KRX indexes. *Non-index* banks are publicly-traded banks that are not included in these indexes. The *March DGW* group includes banks put on downgrade watch in March, 2023. The *April Only DG Banks* group includes banks downgraded between April 14 and 28, 2023. The *index regional banks* (STB) group consists of non-DG regional (US stress-tested) index banks. Non-Index *regional* (*small*) banks have more than (less than or equal to) $10B in total assets. *DG*=Downgraded. *DGW*=Downgrade Watch.

Table 6: **Effect of News on Bank Abnormal Returns: Before and during the run**

Panel A: Contemporaneous Pubcount							
	N	Avg η_0	% η_0 >0 & p<=0.05	% η_0 <0 & p<=0.05	Avg η_1	% η_1 >0 & p<=0.05	% η_1 <0 & p<=0.05
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
All Banks	282	0.09	14.89	18.09	-0.21	12.77	10.99
All index and Event Banks	72	0.43	16.67	16.67	-0.87	18.06	16.67
Event Banks	12	-0.63	16.67	8.33	-0.68	16.67	16.67
STBs	21	2.52*	23.81	9.52	-4.18*	9.52	28.57
Regional Banks	39	-0.38	12.82	23.08	0.86	23.08	10.26
All Nonindex Banks	210	-0.02	14.29	18.57	0.01	10.95	9.05
Large Non-Index	46	0.01	15.22	26.09	-0.11	17.39	6.52
Small Non-Index	164	-0.03	14.02	16.46	0.05	9.15	9.76
Panel B: 2 Day Moving Average of Pubcount							
	N	Avg η_0	% η_0 >0 & p<=0.05	% η_0 <0 & p<=0.05	Avg η_1	% η_1 >0 & p<=0.05	% η_1 <0 & p<=0.05
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
All Banks	282	0.01	13.48	15.96	-0.11	14.54	10.28
All index and Event Banks	72	0.42	12.50	13.89	-0.91	12.50	13.89
Event Banks	12	-1.27	8.33	8.33	0.41	8.33	16.67
STBs	21	2.79**	19.05	4.76	-5.44**	0.00	28.57
Regional Banks	39	-0.34	10.26	20.51	1.12*	20.51	5.13
All Nonindex Banks	210	-0.14**	13.81	16.67	0.16**	15.24	9.05
Large Non-Index	46	-0.12	17.39	21.74	-0.02	15.22	15.22
Small Non-Index	164	-0.14***	12.80	15.24	0.22***	15.24	7.32

Note: Panel A of this table summarizes results from estimating bank by bank this equation for January 1 to May 5, 2023:

$$AR_{i,t} = \alpha_i + \eta_{i,0} PubCount_{i,t} + \eta_{i,1} PubCount_{i,t} \times Post_t + \eta_{i,2} Post_t + \epsilon_{it}$$

Bank abnormal returns AR are calculated using equations (A.1) and (A.2). *Pubcount* are counts of banks publications, normalized by assets in $B. *Post* equals 1 from March 1, 2023. In Panel B, we use the 2-day moving average of *Pubcount*, respectively. We show the mean η_0 and η_1, and the share of banks with significantly positive or negative estimates of η_0 and η_1. *Index* banks are part of the KBW or KRX indexes. Event banks were downgraded in April 2023. *Index regional banks* are non-downgraded banks in the KRX index. (*Non-index*) banks are publicly-traded banks that are not included in these indexes. Non-index regional banks have assets of at least $10B. *STBs*=Non-downgraded US stress-tested banks. Standard errors are corrected for heteroskedasticity. $^*p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table 7: **Effect of News on UID and *Losses* Betas: Before and during the run**

Panel A: UID Factor						
	News=Pubcount		News=Pubcount_MA2		News=Pubcount_MA3	
	Estimate	SE	Estimate	SE	Estimate	SE
Factor*Pre	0.01	0.06	0.03	0.06	0.04	0.06
Factor*Post	0.14***	0.04	0.11***	0.04	0.11**	0.04
Pubcount*Pre	0.00	0.01	0.00	0.01	0.00	0.02
Pubcount*Post	0.02	0.03	0.05	0.04	0.03	0.05
Pubcount*Factor*Pre	-0.02*	0.01	-0.03**	0.01	-0.04*	0.02
Pubcount*Factor*Post	0.09***	0.03	0.16***	0.04	0.18***	0.05
Wald Test: News*Factor*Pre=News*Factor*Post						
P value	0.00		0.00		0.00	
Obs	24134		23852		23570	
Adj R2	0.41		0.42		0.42	
FF5 and Bank MVE?	YES		YES		YES	
Bank FE	YES		YES		YES	
Panel B: Losses Factor						
	News=Pubcount		News=Pubcount_MA2		News=Pubcount_MA3	
	Estimate	SE	Estimate	SE	Estimate	SE
Factor*Pre	0.03	0.05	0.04	0.06	0.06	0.06
Factor*Post	0.15***	0.03	0.12***	0.04	0.13***	0.04
Pubcount*Pre	0.00	0.01	-0.01	0.01	-0.01	0.02
Pubcount*Post	0.00	0.03	0.04	0.06	0.01	0.06
Pubcount*Factor*Pre	-0.03***	0.01	-0.04**	0.01	-0.04**	0.02
Pubcount*Factor*Post	0.07***	0.02	0.12**	0.05	0.11**	0.06
Wald Test: News*Factor*Pre=News*Factor*Post						
P value	0.00		0.00		0.01	
Obs	24134		23852		23570	
Adj R2	0.40		0.41		0.41	
FF5 and Bank MVE?	YES		YES		YES	
Bank FE	YES		YES		YES	

Note: This table shows results from estimating the following panel regression from January 3 to May 5, 2023.

$$
\begin{aligned}
Y_{i,t} = \alpha_i &+ \beta_1 PubCount_{i,t} \times Pre_t + \beta_2 Factor_t \times Pre_t \\
&+ \beta_3 Factor_t \times PubCount_{i,t} \times Pre_t \\
&+ \gamma_1 PubCount_{i,t} \times Post_t + \gamma_2 Factor_t \times Post_t \\
&+ \gamma_3 Factor_t \times PubCount_{i,t} \times Post_t \\
&+ \sum_{j=1}^{5} \delta_j FF_{j,t} + \delta_6 Log(MVE)_{i,t-1} + \delta_7 Post_t + \epsilon_{it}
\end{aligned}
$$

Y is the bank's excess returns. *Pubcount* is a bank's publication counts divided by assets. *Pubcount-MAx* is the moving average of *Pubcount* over x days. *Pre* (*Post*) equals 1 before (since) March 1, 2023. Estimates for the Fama-French factors FF, bank's market value of equity MVE and *Post* are not shown to maintain brevity. The factors are constructed from long-short portfolios based on 2022Q3 asset shares of uninsured deposits (UID) and unrealized losses on AFS and HTM securities (*Losses*). All variables are standardized to have mean zero and unit standard deviation. Standard errors are robust and clustered by date. Stars represent statistical significance: *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Table 8: **Cross-Section of Bank News Betas**

	N	% ß$_3$ >0 & p<=0.05	Avg ß$_3$ >0 & p<=0.05	% ß$_3$ <0 & p<=0.05	Avg ß$_3$ <0 & p<=0.05	% γ_3 >0 & p<=0.05	Avg γ_3 >0 & p<=0.05	% γ_3 <0 & p<=0.05	Avg γ_3 <0 & p<=0.05
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: Factor=Uninsured Deposits									
All Index and Event Banks	72	18.06	0.59	26.39	-0.61	22.22	0.73	9.72	-0.84
Event Banks	12	0.00		25.00	-0.47	16.67	0.76	0.00	
STBs	21	23.81	0.45	23.81	-0.94	23.81	0.99	14.29	-0.74
Regional Banks	39	20.51	0.67	28.21	-0.51	23.08	0.57	10.26	-0.92
All Nonindex Banks	210	14.76	0.70	24.76	-0.66	20.95	0.86	10.00	-0.87
Large Expan	46	10.87	0.56	32.61	-0.78	21.74	0.93	8.70	-0.71
Small Expan	164	15.85	0.73	22.56	-0.61	20.73	0.84	10.37	-0.90
Panel B: Factor=Loss									
	N	% ß$_3$ >0 & p<=0.05	Avg ß$_3$ >0 & p<=0.05	% ß$_3$ <0 & p<=0.05	Avg ß$_3$ <0 & p<=0.05	% γ_3 >0 & p<=0.05	Avg γ_3 >0 & p<=0.05	% γ_3 <0 & p<=0.05	Avg γ_3 <0 & p<=0.05
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
All Index and Event Banks	72	20.83	0.67	19.44	-0.45	16.67	0.63	20.83	-0.77
Event Banks	12	16.67	1.10	16.67	-0.42	16.67	0.40	8.33	-1.68
STBs	21	14.29	0.83	14.29	-0.72	9.52	0.68	23.81	-0.91
Regional Banks	39	25.64	0.54	23.08	-0.37	20.51	0.68	23.08	-0.58
All Nonindex Banks	210	13.33	0.60	27.14	-0.82	27.14	0.95	9.52	-0.74
Large Expan	46	8.70	0.64	28.26	-0.76	23.91	0.76	8.70	-0.86
Small Expan	164	14.63	0.60	26.83	-0.84	28.05	1.00	9.76	-0.72
Panel C: Cash									
	N	% ß$_3$ >0 & p<=0.05	Avg ß$_3$ >0 & p<=0.05	% ß$_3$ <0 & p<=0.05	Avg ß$_3$ <0 & p<=0.05	% γ_3 >0 & p<=0.05	Avg γ_3 >0 & p<=0.05	% γ_3 <0 & p<=0.05	Avg γ_3 <0 & p<=0.05
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
All Index and Event Banks	72	20.83	0.69	18.06	-0.62	26.39	0.65	19.44	-0.61
Event Banks	12	0.00		8.33	-0.61	33.33	0.51	0.00	
STBs	21	14.29	0.67	23.81	-0.70	28.57	0.79	14.29	-0.44
Regional Banks	39	30.77	0.69	17.95	-0.56	23.08	0.61	28.21	-0.65
All Nonindex Banks	210	13.81	0.84	21.43	-0.78	19.05	0.94	10.48	-1.07
Large Expan	46	15.22	0.58	26.09	-0.97	21.74	0.93	10.87	-0.70
Small Expan	164	13.41	0.93	20.12	-0.72	18.29	0.95	10.37	-1.18
Panel D: CET1									
	N	% ß$_3$ >0 & p<=0.05	Avg ß$_3$ >0 & p<=0.05	% ß$_3$ <0 & p<=0.05	Avg ß$_3$ <0 & p<=0.05	% γ_3 >0 & p<=0.05	Avg γ_3 >0 & p<=0.05	% γ_3 <0 & p<=0.05	Avg γ_3 <0 & p<=0.05
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
All Index and Event Banks	72	18.06	0.53	22.22	-0.65	25.00	0.75	11.11	-0.83
Event Banks	12	16.67	0.80	16.67	-0.57	33.33	0.44	16.67	-0.72
STBs	21	14.29	0.55	28.57	-0.73	23.81	0.83	4.76	-1.64
Regional Banks	39	20.51	0.45	20.51	-0.60	23.08	0.85	12.82	-0.71
All Nonindex Banks	210	12.38	1.12	18.10	-0.77	18.57	0.81	9.52	-1.36
Large Expan	46	13.04	0.68	21.74	-0.83	19.57	0.95	13.04	-0.87
Small Expan	164	12.20	1.25	17.07	-0.76	18.29	0.76	8.54	-1.57

Note: This table summarizes the results of estimating the following regression by bank i from January 1 to May 5, 2023.

$$
\begin{aligned}
Y_{i,t} = {} & \alpha_i + \beta_{i,1} PubCountMA2_{i,t} + \beta_{i,2} Factor_t + \beta_{i,3} Factor_t \times PubCountMA2_{i,t} \\
& + \gamma_{i,1} PubCountMA2_{i,t} \times Post_t + \gamma_{i,2} Factor_t \times Post_t + \gamma_{i,3} Factor_t \times PubCountMA2_{i,t} \times Post_t \\
& + \sum_{j=1}^{5} \delta_{i,j} FF_{j,t} + \delta_{i,6} Log(MVE)_{i,t-1} + \delta_{i,7} Post_t + \epsilon_{it}
\end{aligned}
$$

Y is the bank's excess returns. $PubcountMA2$ is the 2-day moving average of $Pubcount$, a bank's publication counts divided by assets. We show the mean β_3 and γ_3 and the percentage of banks with significantly positive or negative β_3 or γ_3 estimates, by bank group. All variables in the regression are standardized to have mean zero and unit standard deviation. *Index* banks are part of the KBW or KRX indexes. *Non-index* banks are publicly-traded banks that are not included in these indexes. Non-Index *regional* (*small*) banks have more than (less than or equal to) $10B in total assets. *STBs*=Non-downgraded US stress-tested banks. *index regional banks*=Non-downgraded banks in the KRX index.

Table 9: **Shares of Unrealized Losses on and Quantities of OMO Securities**

Panel A: OMO Loss Share 2022Q4							
Bank Group	Number	Mean	Min	P25	P50	P75	Max
All Index and Event Banks	72	1.98	0.03	1.09	1.80	2.63	5.17
April Only	7	2.60	0.58	1.42	2.45	4.18	4.47
March DGW	5	1.75	0.58	0.67	1.45	2.66	3.41
STBs	21	1.80	0.03	1.11	1.90	2.30	3.85
Index Regional Banks	39	2.00	0.10	1.06	1.78	2.62	5.17
All Non-Index Banks	210	1.32	0.00	0.42	1.02	2.02	7.00
Non-Index Regional Banks	46	1.73	0.02	0.90	1.53	2.38	4.52
Small Non-Index Banks	164	1.20	0.00	0.37	0.89	1.84	7.00
Panel B: OMO Securities Share 2022Q4							
Bank Group	Number	Mean	Min	P25	P50	P75	Max
All Index and Event Banks	72	16.65	1.67	9.39	15.42	22.31	54.73
April Only	7	23.17	6.77	9.41	20.69	31.14	54.73
March DGW	5	14.49	2.71	5.00	20.84	20.90	23.00
STBs	21	17.06	1.67	13.66	17.00	20.90	29.72
Index Regional Banks	39	15.55	4.10	7.93	13.57	22.63	38.04
All Non-Index Banks	210	10.58	0.00	4.43	9.37	14.60	38.85
Non-Index Regional Banks	46	13.74	0.12	8.30	11.96	17.27	38.85
Small Non-Index Banks	164	9.69	0.00	3.87	8.13	13.96	37.43

Note: The table shows the distribution of the asset shares of unrealized losses on OMO securities (Panel A) and holdings of these securities (Panel B) in 2022Q4. The *March DGW* group includes banks put on DG watch in March. The *April Only DG Banks* group includes banks downgraded between April 14 and 28, 2023. *Index* banks are part of the KBW or KRX indexes. *Non-index* banks are publicly-traded banks that are not included in these indexes. Non-Index *regional* (*small*) banks have more than (less than or equal to) $10B in total assets. The *index regional banks* (STB) group consists of non-DG regional (US stress-tested) banks. *DG*=Downgraded.

Table 10: **Effect of BTFP Announcement on Bank Abnormal Returns**

	High OMO Loss			Low OMO Loss			High-Low AR%	
	Avg AR % (1)	%AR>0 & p<=0.05 (2)	%AR<0 & p<=0.05 (3)	Avg AR % (4)	%AR>0 & p<=0.05 (5)	%AR<0 & p<=0.05 (6)	Weekly (7)	Cum. 2 wks (8)
Panel A: BTFP Ann Week=March 13-17								
Announcment Week								
All Banks	-0.02	26.62	7.91	-0.36	22.70	12.06	0.34	0.10
All Index and Event Banks	-1.09	18.00	20.00	-1.42	22.73	18.18	0.33	0.67
Event Banks	-3.40	0.00	22.22	-12.05	0.00	33.33	8.65	8.06**
STBs	-2.18	0.00	42.86	-0.31	0.00	28.57	-1.87*	-0.37
Index Regionals	0.24	33.33	7.41	0.59	41.67	8.33	-0.35	-0.54
All Nonindex Banks	0.59	31.46	1.12	-0.16	22.69	10.92	0.75**	0.19
Non-Index Regionals	0.66	33.33	0.00	0.21	38.89	11.11	0.44	-0.23
Small Non-Index Banks	0.56	30.65	1.61	-0.23	19.80	10.89	0.79**	0.23
Post-Announcment Week								
All Banks	0.22	12.95	5.76	0.35	19.15	8.51	-0.13	
All Index and Event Banks	0.30	16.00	6.00	-0.71	22.73	18.18	1.01	
Event Banks	1.10	11.11	0.00	-6.37	0.00	0.00	7.47	
STBs	0.43	14.29	7.14	-0.71	0.00	28.57	1.14*	
Index Regionals	-0.03	18.52	7.41	0.70	41.67	16.67	-0.73	
All Nonindex Banks	0.17	11.24	5.62	0.55	18.49	6.72	-0.38	
Non-Index Regionals	0.35	11.11	0.00	1.25	27.78	0.00	-0.90	
Small Non-Index Banks	0.09	11.29	8.06	0.42	16.83	7.92	-0.33*	
Panel B: Placebo Ann Week=Feb 13-17								
	High OMO Loss			Low OMO Loss			High-Low AR%	
	Avg AR % (1)	%AR>0 & p<=0.05 (2)	%AR<0 & p<=0.05 (3)	Avg AR % (4)	%AR>0 & p<=0.05 (5)	%AR<0 & p<=0.05 (6)	Weekly (7)	Cum. 2 wks (8)
Announcment Week								
All Banks	-0.18	2.86	14.29	-0.11	8.51	11.35	-0.07	-0.04
All Index and Event Banks	-0.29	4.00	18.00	-0.17	13.64	18.18	-0.12	-0.01
Event Banks	-0.15	11.11	0.00	-0.21	33.33	0.00	0.06	0.29
STBs	-0.32	0.00	14.29	-0.28	14.29	42.86	-0.03	-0.11
Index Regionals	-0.32	3.70	25.93	-0.09	8.33	8.33	-0.23	-0.05
All Nonindex Banks	-0.11	2.22	12.22	-0.09	7.56	10.08	-0.02	-0.07
Non-Index Regionals	-0.18	0.00	10.71	-0.14	0.00	5.56	-0.04	-0.15
Small Non-Index Banks	-0.09	3.23	12.90	-0.09	8.91	10.89	0	-0.02
Post-Announcment Week								
All Banks	-0.02	13.57	12.86	-0.01	7.80	9.93	-0.02	
All Index and Event Banks	0.18	20.00	10.00	0.09	9.09	0.00	0.09	
Event Banks	0.36	33.33	0.00	-0.16	0.00	0.00	0.52	
STBs	0.03	14.29	7.14	0.22	14.29	0.00	-0.19	
Index Regionals	0.20	18.52	14.81	0.07	8.33	0.00	0.13	
All Nonindex Banks	-0.13	10.00	14.44	-0.02	7.56	11.76	-0.11	
Non-Index Regionals	-0.28	10.71	21.43	-0.02	5.56	11.11	-0.26	
Small Non-Index Banks	-0.07	9.68	11.29	-0.02	7.92	11.88	-0.04	

Note: This table shows summary statistics from estimating the following specification by bank i :

$$AR_{i,t} = \alpha_i + \sum_{k=1}^{3} AR_{i,k} + \eta_{i,0} Day[0,4]_{i,t} + \gamma_{i,0} Day[5,9]_{i,t} + \epsilon_{it}$$

Abnormal returns AR are calculated according to equations (A.1) and (A.2). Day [0,4] is the announcement week and Day [5,9] is the post-announcement week. Results are shown for the BTFP announcement week of March 13-17, 2023, using the sample March 1-31 (Panel A), and a placebo week of February 13-17, using the sample February 1-28 (Panel B). *OMO Loss* refers to unrealized losses on collateral eligible for open market operations. *Index* banks are part of the KBW or KRX indexes. The *index regional banks* (STB) group consists of non-DG regional (US stress-tested) banks. The *event banks* were downgraded in April. *Non-index* banks are publicly-traded banks that are not included in these indexes. Non-Index *regional* (*small*) banks have more than (less than or equal to) $10B in total assets. Stars represent statistical significance based on Newey-West standard errors: $^*p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table 11: **Effect of BTFP Announcement on Factor Betas**

Panel A: OMO Losses								
	Factor=UID		Factor=Loss		Factor=Cash		Factor=CET1	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Factor	0.28***	0.03	0.39***	0.03	0.27***	0.03	0.23***	0.02
Factor*Post	0.02	0.03	-0.19***	0.03	0.03	0.03	0.07***	0.03
Factor*OMOLoss	0.09***	0.03	0.02	0.03	-0.08***	0.02	0.02	0.02
Factor*OMOLoss*Post	-0.08***	0.03	-0.01	0.03	0.10***	0.02	-0.01	0.03
Obs	5582		5582		5582		5582	
Adj R2	0.65		0.66		0.66		0.66	
FF5 and Bank MVE?	YES		YES		YES		YES	
Bank FE	YES		YES		YES		YES	
Panel B: OMO Quantity								
	Factor=UID		Factor=Loss		Factor=Cash		Factor=CET1	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Factor	0.07	0.09	0.35***	0.08	0.49***	0.06	0.18***	0.07
Factor*Post	0.24***	0.08	-0.13	0.08	-0.21***	0.07	0.13*	0.07
Factor*OMOQ	0.10***	0.04	0.02	0.03	-0.10***	0.03	0.03	0.03
Factor*OMOQ*Post	-0.10***	0.04	-0.02	0.03	0.11***	0.03	-0.03	0.03
Obs	5582		5582		5582		5582	
Adj R2	0.65		0.66		0.66		0.66	
FF5 and Bank MVE?	YES		YES		YES		YES	
Bank FE	YES		YES		YES		YES	

Note: This table shows results from estimating the following panel regression from February 27 to March 24, 2023.

$$Y_{i,t} = \alpha_i + \gamma Post_t + \beta_1 Factor_t + \beta_2 Factor_t \times Post_t + \beta_3 Factor_t \times OMO_{i,22q4}$$
$$+ \beta_4 Factor_t \times OMO_{i,22q4} \times Post_t + \sum_{j=1}^{5} \delta_j FF_{j,t} + \delta_6 Log(MVE)_{i,t-1} + \epsilon_{it}$$

Y is the bank's excess returns. The post-BTFP announcement dummy variable *Post* equals 1 from March 13-24, 2023. OMO are *OMO Losses* or *OMOQ*. *OMO Losses* are the logs of unrealized losses on securities eligible for open market operations (OMO), as a share of assets, in 2022Q4. *OMOQ* indicates the log of holdings of OMO-eligible securities, as a share of assets, in 2022Q4. The factors are constructed from long-short portfolios based on 2022Q3 asset shares of uninsured deposits (UID), unrealized losses on AFS and HTM securities (*Losses*) and cash, and CET1. All variables are standardized to have mean zero and unit standard deviation. Standard errors are robust and clustered by date. Stars represent statistical significance: $^*p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table 12: **Cross-Section of Changes in Factor Betas After BTFP Announcement**

Panel A: Factor=UID				
	Share in	Mean ß$_{i,2}$	% ß$_{i,2}$<0 & p<=0.05	% ß$_{i,2}$>0 & p<=0.05
	High	High-Low	High-Low	High-Low
Event Banks	75.00	-0.20***	-22.22	-66.67
Non-Index Regional Banks	60.87	-0.15***	22.62	-2.38
STBs	66.67	-0.14***	14.29	7.14
Index Regional Banks	69.23	0.24***	0.00	11.11
Small Non-Index Banks	38.04	-0.07***	2.75	-2.68
Panel B: Factor=Losses				
	Share in	Mean ß$_{i,2}$	% ß$_{i,2}$<0 & p<=0.05	% ß$_{i,2}$>0 & p<=0.05
	High	High-Low	High-Low	High-Low
Event Banks	75.00	-0.61***	44.44	-33.33
Non-Index Regional Banks	60.87	0.15***	-19.05	0.00
STBs	66.67	-0.10***	21.43	0.00
Index Regional Banks	69.23	-0.25***	25.00	0.00
Small Non-Index Banks	38.04	0.03***	6.48	-4.07
Panel C: Factor=Cash				
	Share in	Mean ß$_{i,2}$	% ß$_{i,2}$<0 & p<=0.05	% ß$_{i,2}$>0 & p<=0.05
	High	High-Low	High-Low	High-Low
Event Banks	75.00	-0.19***	33.33	0.00
Non-Index Regional Banks	60.87	0.41***	-18.65	3.17
STBs	66.67	0.24***	-35.71	-7.14
Index Regional Banks	69.23	-0.33***	22.22	7.41
Small Non-Index Banks	38.04	0.13***	0.65	1.13
Panel D: Factor=CET1				
	Share in	Mean ß$_{i,2}$<0	% ß$_{i,2}$>0 & p<=0.05	% ß$_{i,2}$<0 & p<=0.05
	High	High-Low	High-Low	High-Low
Event Banks	75.00	-0.31***	33.33	0.00
Non-Index Regional Banks	60.87	0.05***	14.29	1.59
STBs	66.67	0.03*	7.14	0.00
Index Regional Banks	69.23	0.08***	-2.78	3.70
Small Non-Index Banks	38.04	0.06***	0.26	-6.90

Note: This table summarizes results from estimating the following regression by bank i from March 1 to March 24, 2023.

$$Y_{i,t} = \alpha_i + \gamma_i Post_t + \beta_{i,1} Factor_t + \beta_{i,2} Factor_t \times Post_t + \sum_{j=1}^{5} \delta_{i,j} FF_{j,t} + \delta_{i,6} Log(MVE)_{i,t-1} + \epsilon_{it}$$

Y is the bank's excess returns. *Post* equals 1 during March 13-24. We show the mean and the share of banks with a significantly positive or negative estimates of $\beta_{i,2}$. *High* (*Low*) indicates banks with above (less than or equal to) median *OMO Losses* (i.e., unrealized losses on collateral eligible for open market operations) as a share of assets, in 2022Q4. *Index* banks are part of the KBW or KRX indexes. *Non-index* banks are publicly-traded banks that are not included in these indexes. *Event banks* were downgraded in April, 2023. STBs are non-DG US stress-tested banks. Non-Index *regional* (*small*) banks have more than (less than or equal to) $10B in total assets. All variables in the regression are standardized to have mean zero and unit standard deviation. Stars represent statistical significance based on Newey-West standard errors: *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Table 13: **Changes in Factor Betas After Banks' First BTFP or Discount Window Borrowings**

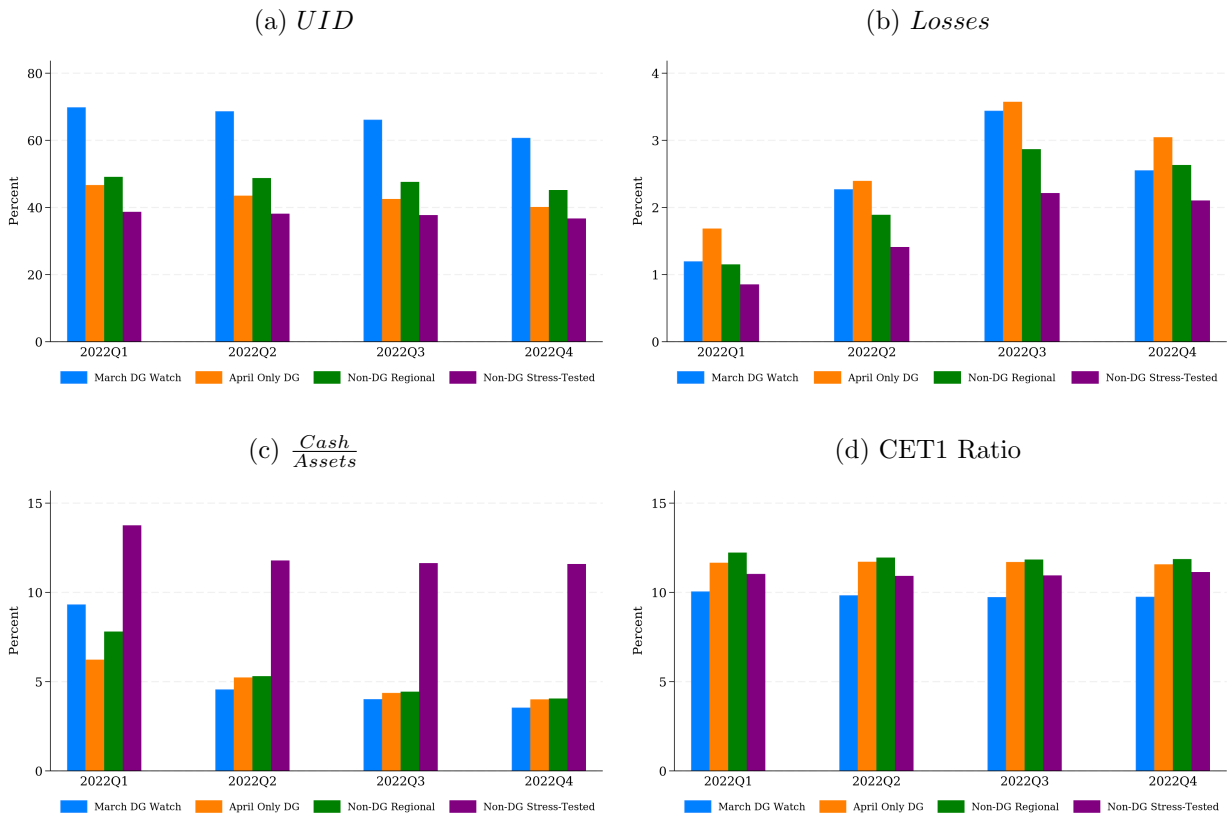
Panel A: BTFP Borrowing								
	Factor=UID		Factor=Loss		Factor=Cash		Factor=CET1	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Factor	0.12	0.11	0.17	0.11	0.11	0.11	0.05	0.11
Factor*Post	0.19**	0.08	0.03	0.10	0.17	0.11	0.23**	0.09
Factor*Borrow	0.18**	0.07	0.11	0.09	0.22**	0.09	0.25***	0.07
Factor*Borrow*Post	-0.11	0.09	-0.09	0.10	-0.27**	0.12	-0.22**	0.10
Obs	9240		9240		9240		9240	
Adj R2	0.58		0.57		0.58		0.57	
FF5 and Bank MVE?	YES		YES		YES		YES	
Bank FE	YES		YES		YES		YES	
Panel B: DW Borrowing								
	Factor=UID		Factor=Loss		Factor=Cash		Factor=CET1	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Factor	0.16	0.11	0.19*	0.11	0.11	0.12	0.07	0.11
Factor*Post	0.16*	0.08	0.01	0.10	0.18	0.12	0.22**	0.10
Factor*Borrow	0.07	0.05	0.02	0.07	0.13	0.08	0.12*	0.06
Factor*Borrow*Post	-0.02	0.06	0.05	0.07	-0.07	0.08	-0.07	0.07
Obs	9240		9240		9240		9240	
Adj R2	0.58		0.57		0.58		0.57	
FF5 and Bank MVE?	YES		YES		YES		YES	
Bank FE	YES		YES		YES		YES	

Note: This table reports results from estimating the following panel regression February 27 to April 13.

$$Y_{i,t} = \alpha_i + \gamma Post_{i,t} + \beta_1 Factor_t + \beta_2 Factor_t \times Post_{i,t} + \beta_3 Factor_t \times Borrow_i$$
$$+ \beta_4 Factor_t \times Borrow_i \times Post_{i,t} + \sum_{j=1}^{5} \delta_{i,j} FF_{j,t} + \delta_6 Log(MVE)_{i,t-1} + \epsilon_t$$

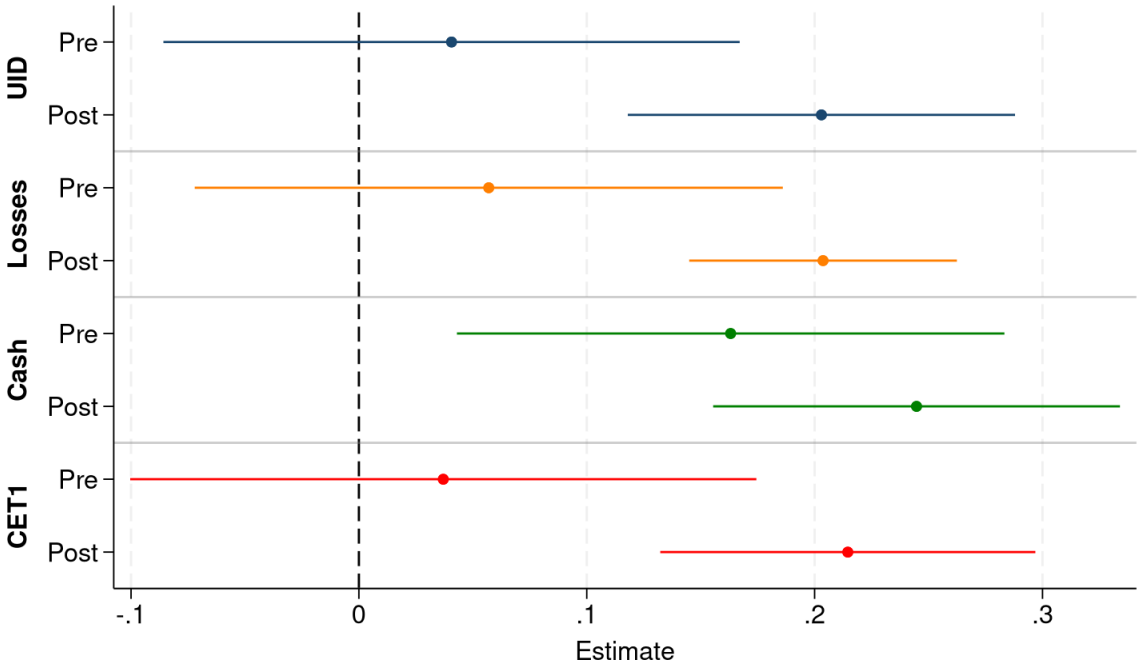
Y is the bank's excess returns. $Borrow_i$=1 if a bank i borrowed at the BTFP or the DW. $Post_{i,t}$ equals 1 in the 10 days after bank i *first* borrows from the BTFP (Panel A) or the DW (Panel B). Non-borrowing banks ($Borrow_i$=0) are assumed to first borrow on March 13. All variables in the regression are standardized to have mean zero and unit standard deviation. Standard errors are robust and clustered by date. Stars represent statistical significance: *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Figure 1: **Bank Balance Sheet Characteristics in 2022, by Bank Group**



Note: This table shows the average values of bank balance sheet characteristics of *index* banks (i.e., those included in the KBW or KRX indexes) by bank group for 2022. The ratios are reported in %. UID is the asset share of uninsured deposits. *Losses* is the asset share of unrealized losses on AFS and HTM securities. The *March DGW* group includes banks put on DG watch in March, 2023. The *April Only DG* group includes banks downgraded between April 14 and 21, 2023. The *Non-DG Resional (Stress-Tested)* group consists of non-downgraded regional (US stress-tested) index banks. *DG*=Downgraded.

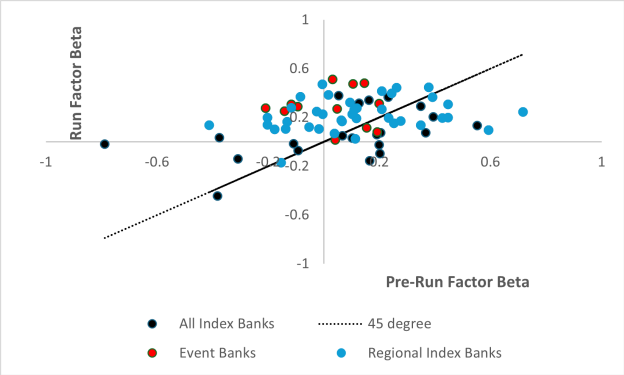
Figure 2: **Evolution of Factor Betas Before and During the Run**



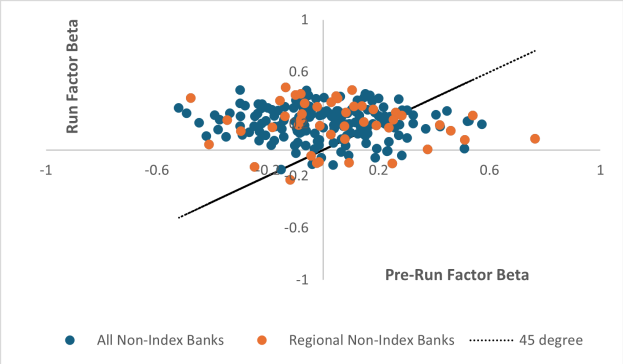
Note: This figure shows the point estimates and 95% confidence intervals from estimating regression (1) for January 3 to May 5, 2023, as reported in Table 2. The pre- (post-) run dummy variable *Pre* (*Post*) equals 1 before (since) March 1, 2023. The factors are constructed from long-short portfolios based on 2022Q3 asset shares of uninsured deposits (UID), unrealized losses on AFS and HTM securities (*Losses*), cash as shares of assets, and the common equity tier one ratio CET1. The *negative* of the cash and CET1 factor returns is used for consistency with the other factors. Downgraded and failed banks are excluded from the factor construction. SVB, SBNY and Silvergate are not included in the sample. All variables are standardized to have mean zero and unit standard deviation. Standard errors (used to calculate confidence intervals) are robust and clustered by date.

Figure 3: **Bank Balance Sheet Betas Before and During the Run**

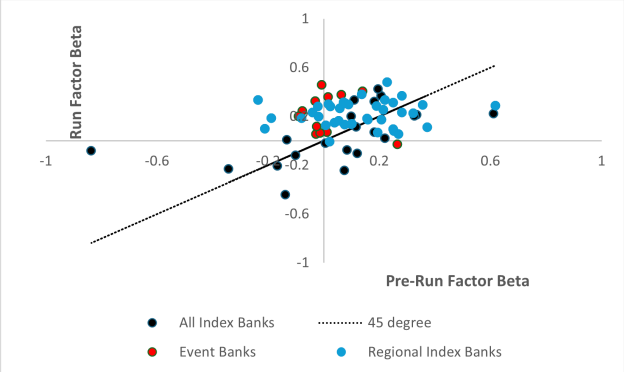
(a) *UID*: Index Banks



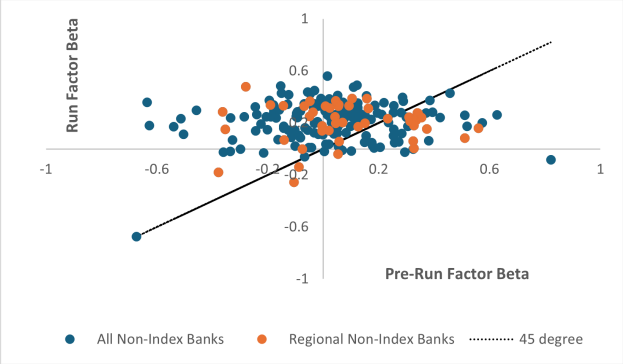
(b) *UID*: Non-Index Banks



(c) *Losses*: Index Banks



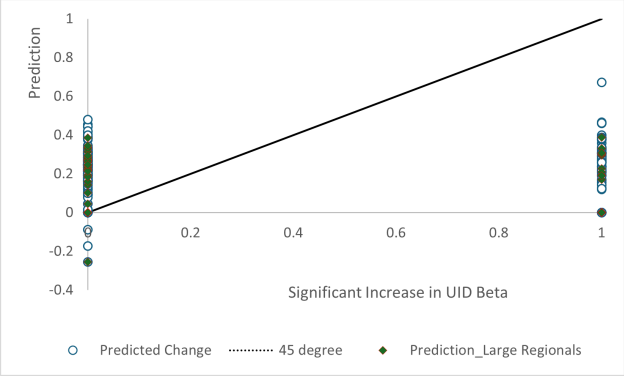
(d) *Losses* Non-Index Banks



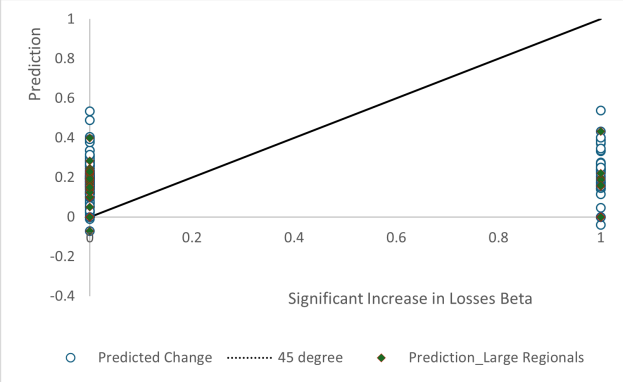
Note: These figures show scatter plots of UID and *Losses* factor beta estimates before the run (horizontal axis) versus during the run (vertical axis), obtained by estimating specification (A.3) bank-by-bank. Also shown is the 45-degree line. Colored dots indicate the estimates for the *event* banks (i.e., banks downgraded by rating agencies; red dots in left panel) or *index regional Banks* (blue dots in left panel) or *Non-index regional Banks* (orange dots in right panel). *Index* banks are part of the KBW or KRX indexes. *Non-index* banks are publicly-traded banks that are not included in these indexes. Non-index regional banks have assets of at least \$10B. UID is the asset share of uninsured deposits. *Losses* is the asset share of unrealized losses on AFS and HTM securities.

Figure 4: **Predicting Increases in Bank Betas During the Run Using 2022Q3 Balance Sheet Values**

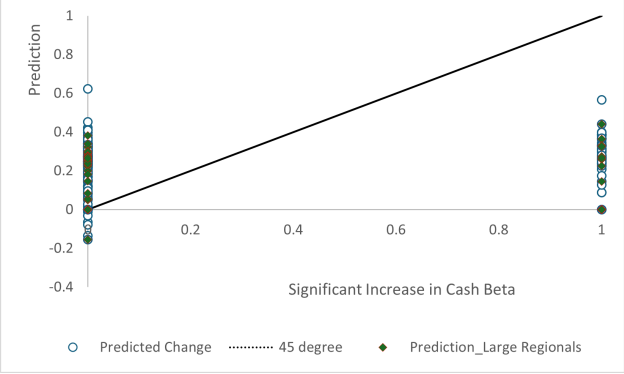
(a) UID



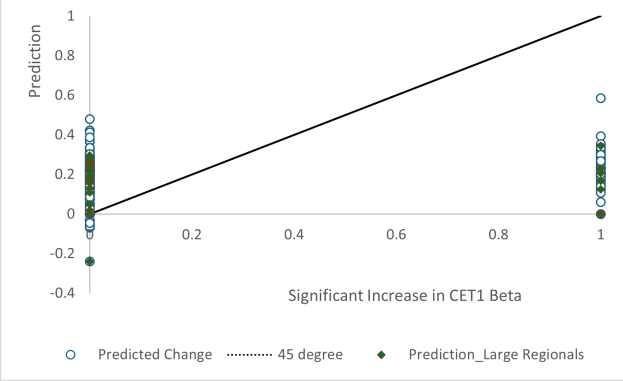
(b) $Losses$



(c) $\frac{Cash}{Assets}$



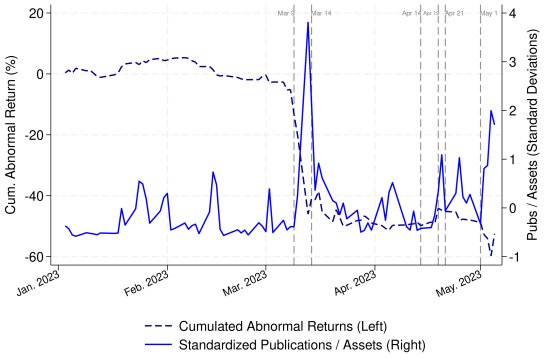
(d) CET1 Ratio



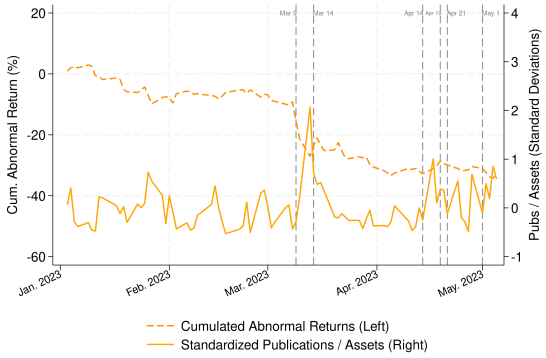
Note: These figures show scatter plots of actual versus predicted increases in factor betas during the run. The horizontal axis plots a dummy variable equal to 1 for banks with significant increases in their factor betas during the run. The vertical axis shows estimates from the regression (2). Colored dots indicate the estimates for large *index* regional banks that have assets of at least $10B and are included in the KRX index. UID is the asset share of uninsured deposits. *Losses* is the asset share of unrealized losses on AFS and HTM securities.

Figure 5: **Cumulated Abnormal Returns and Standardized Publication Counts**

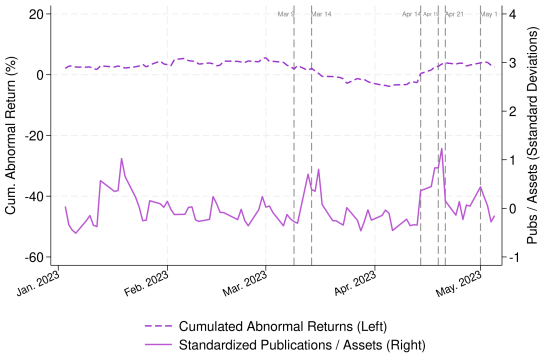
(a) March DG Watch



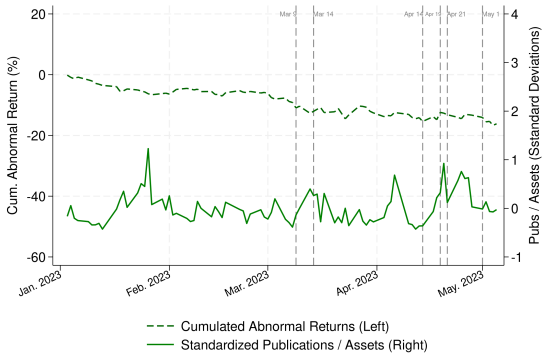
(b) April Only DG



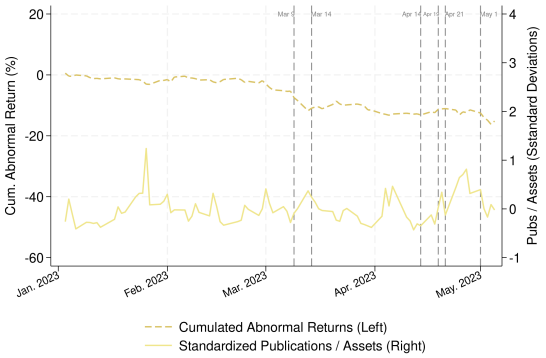
(c) Non-DG STBs



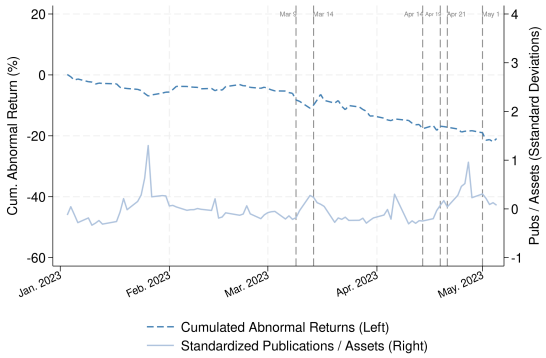
(d) Index Regionals



(e) Non-Index Regionals



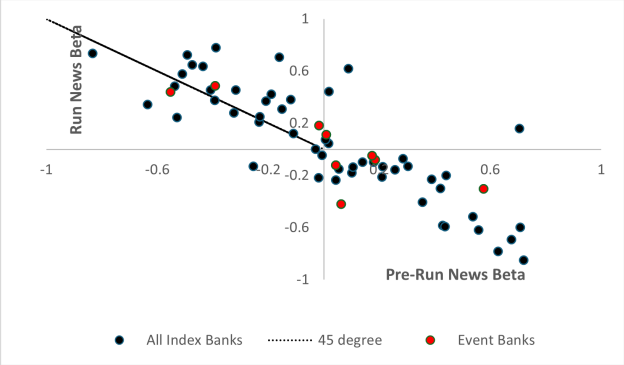
(f) Non-Index Small



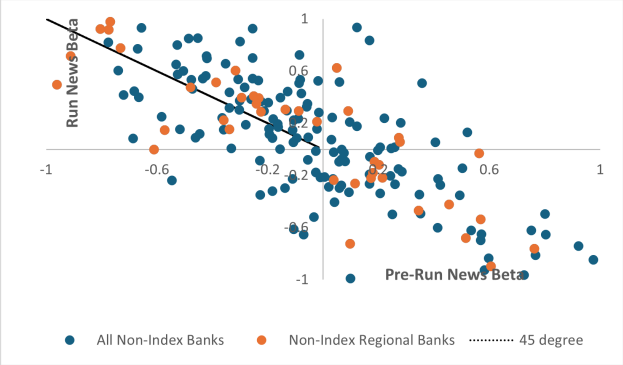
Note: This figure plots standardized values of *Pubcount*, or a bank's news publications over its assets, averaged (unweighted) by bank group. Also shown is the value-weighted cumulated abnormal returns (AR) by bank group g, where AR_g is calculated using (A.1) and (A.2) and then cumulated from January 3 to May 5, 2023. *Index* banks are part of the KBW or KRX indexes. *Non-index* banks are publicly-traded banks that are not included in these indexes. The *March DGW* group includes banks put on DG watch in March. The *April Only DG* group includes banks downgraded between April 14 and 21. The *Index Regional (Stress-Tested)* group consists of non-downgraded regional (US stress-tested) index banks. Non-index regional banks have assets of at least $10B. *DG*=Downgraded.

Figure 6: **Bank Balance Sheet and News Betas Before and During the Run: *UID* and *Losses* Factors**

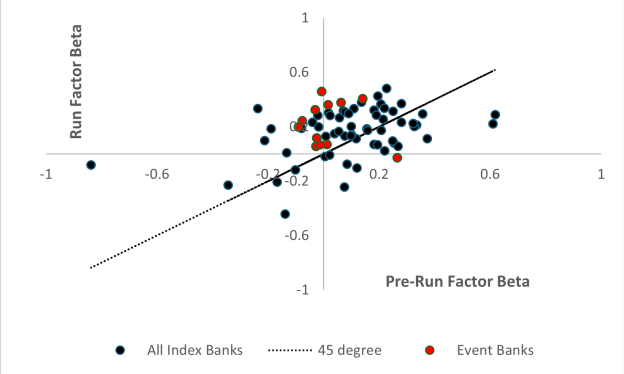
(a) *UID* News Beta: Index and Event Banks



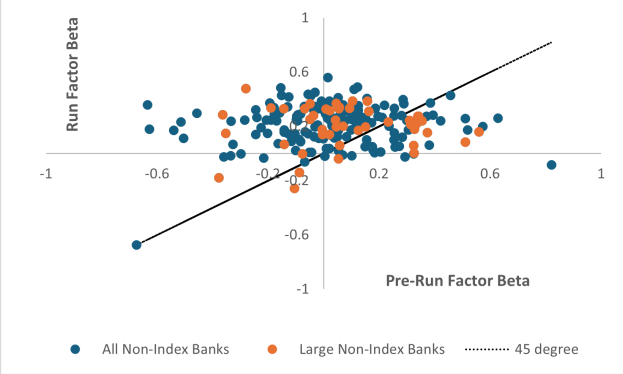
(b) *UID* News Beta: Non-Index Banks



(c) *Losses* News Beta: Index and Event Banks



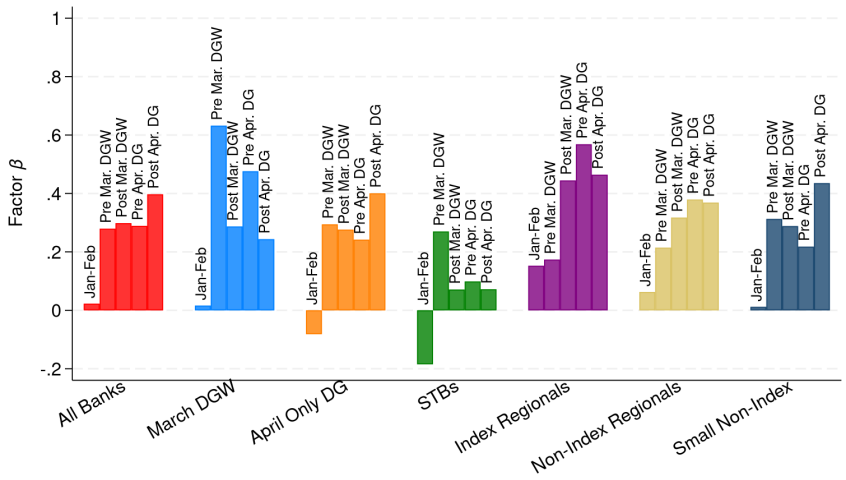
(d) *Losses* News Beta: Non-Index Banks



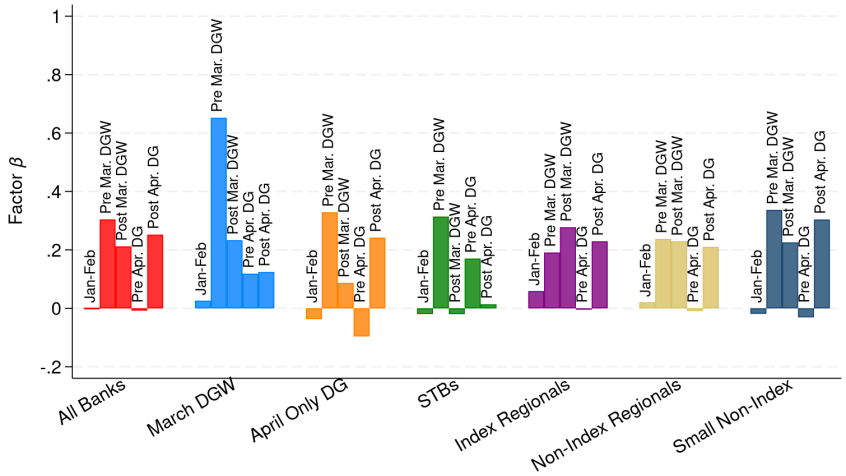
Note: These figures show scatter plots of *UID* and *Losses* news β estimates pre-run (horizontal axis) versus during the run (vertical axis) for index (left panel) and non-index banks (right panel), obtained by estimating specification (A.6) bank by bank from January 1 to May 5, 2023. The news β is the coefficient on the $Factor \times News$ regressor. *Index* banks are part of the KBW or KRX indexes. *Non-index* banks are publicly-traded banks that are not included in these indexes. Colored dots indicate estimates for the *event* banks (i.e., banks downgraded by rating agencies in April) in the right panel and for non-index regional banks in the left panel. *UID* is the asset share of uninsured deposits. *Losses* is the asset share of unrealized losses on AFS and HTM securities.

Figure 7: **Average Betas Around Rating Announcements: *UID* and *Losses* Factors**

(a) Factor=*UID*



(b) Factor=*Losses*



Note: These figures summarize the results from estimating this equation:

$$Y_{i,t} = \alpha_i + \beta_{i,0} Factor_t + \sum_{k=1}^{5} \beta_{i,k} Period_{k,t} \times Factor_t + \sum_{k=1}^{5} \zeta_{i,k} Period_{k,t} + \sum_{j=1}^{5} \delta_{i,j} FF_{j,t} + \delta_{i,6} Log(MVE)_{i,t-1} + \epsilon_{it}$$

where Y_i is the excess return of bank i, $Period_{k,t}$ are dummy variables for the 10 trading days before and after the March and April announcements, and sample days omitted from these periods. January-February is the reference period. We plot the average β for each period. The *March DGW* group banks were put on downgrade watch on March 14. The *April Only DG* group includes banks downgraded between April 14 and 21. *Index regional banks* are non-downgraded banks in the KRX index. (*Non-index*) banks are publicly-traded banks excluded from the KRX and KBW indexes. Non-index regional (small) banks have assets of at least (less than) $10B. *STBs*=Non-downgraded US stress-tested banks. All variables in the regression are standardized to have mean zero and unit standard deviation. *DGW*=Downgrade watch. *DG*=Downgrades.

A Appendix: Data and Regression Specifications

A.1 Linking Balance Sheet and Stock Data

We start with a list of bank stock tickers, and use this list to obtain stock returns, market capitalization, permanent company code (PERMCO) and entity name from CRSP. We then merge this list of PERMCOs to the Federal Reserve Bank of New York's PERMCO-RSSD crosswalk for all PERMCO-RSSD mappings that have an end date after the start of our sample (January 3, 2022).[21]. This crosswalk matches with most sample banks banks. For the remaining banks, we manually map them to an RSSD using the following procedure. We take the entity name from CRSP and paste it into the Federal Financial Institutions Examination Council's (FFIEC) RSSD Lookup tool.[22] Each entity name yields only one result in the FFIEC data which gives us the RSSD of the bank. Having obtained a mapping from bank stocks to RSSDs, we are able to map the returns data to balance sheet data from Call Reports and FR Y-9C filings.

A.2 Call Report Submission Deadlines

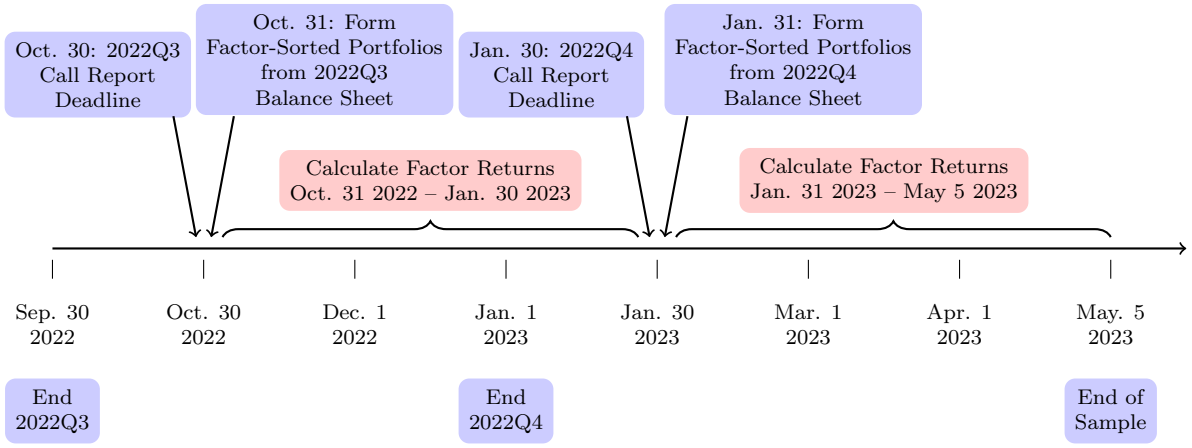
To sort banks into the long-short portfolios, we use balance sheet data from the previous quarter, starting the day after the submission deadline for the previous quarter's Call Report until the submission deadline of the next Call Report. The submission deadlines and dates for which we use the Call Reports are listed in Table A.1. An illustration of how the Call Reports submission dates inform the calculation of factor returns is in Figure A.1.

Table A.1: **Call Report Submission Deadlines**

Call Report Quarter	Submission Deadline	Factor Return Dates
2021Q3	October 30, 2021	January 1, 2022 – January 30, 2022
2021Q4	January 30, 2022	January 31, 2022 – April 30, 2022
2022Q1	April 30, 2022	May 1, 2022 – July 30, 2022
2022Q2	July 30, 2022	July 31, 2022 – October 30, 2022
2022Q3	October 30, 2022	October 31, 2022 – January 30, 2023
2022Q4	January 30, 2023	January 31, 2023 – April 30, 2023
2023Q1	April 30, 2023	N/A

[21] Available here: `https://www.newyorkfed.org/research/banking_research/crsp-frb`
[22] Available here: `https://www.ffiec.gov/NPW`

Figure A.1: **Call Report Submission Dates and Construction of Factor Returns**



Note: The figure illustrates how the Call Report submission dates inform the calculation of factor returns.

A.3 Regression Specifications

A.3.1 Estimating Bank Abnormal Returns

We compute bank abnormal returns relative to the Fama-French 5-factor model using data from Q1-Q3 of 2022.

$$R_{i,t} = \alpha_{0,i} + \sum_{j=1}^{5} \delta_{j,i} FF_{j,t} + \epsilon_{it} \tag{A.1}$$

R_{it} is the stock return for bank i at time t. FF_j denotes one of the 5 Fama-French factors (i.e., the market excess return RM-RF, SMB, HML, RMW and CMA).[23]

Let $\hat{\alpha}_{0,i}$ and $\hat{\delta}_{j,i}$, $i = 1, ..6$ be the coefficients from estimating equation (A.1) for 2022. Then, for day $t >= 2022Q4$, the abnormal returns $AR_{i,t}$ for bank i are defined as:

$$AR_{i,t} = R_{i,t} - \hat{\alpha}_{0,i} - \sum_{j=1}^{5} \hat{\delta}_{j,i} FF_{j,t} - \hat{\delta}_{6,i}(KBWR_t - RF_t) \tag{A.2}$$

[23]Data for the Fama-French factors are downloaded from the Kenneth R. French data library (FFData). We thank Kenneth French for use of the data.

A.3.2 Beta and Crisis

Cross-section of betas. To test Hypothesis 1(b) — whether beta changes are related to bank risk — we estimate regression (1) *bank-by-bank*, but without using the *Pre* dummy.

$$\begin{aligned} Y_{i,t} = \alpha_i + \beta_{i,1} Factor_t + \beta_{i,2} Post_t \times Factor_t \\ + \sum_{j=1}^{5} \delta_{i,j} FF_{j,t} + \delta_{i,6} Log(MVE)_{i,t-1} + \gamma_i Post_t + \epsilon_{it} \end{aligned} \tag{A.3}$$

We report summary statistics of the bank betas and t-statistics for the significance of the mean. The t-statistics are corrected for heteroskedasticity using the Newey-West procedure. (This correction is made whenever we report means of cross-section estimates).

A.3.3 Publications, Returns and Beta

Informativeness of Publications. To examine whether the publication counts are informative, we estimate for each bank i:

$$AR_{i,t} = \alpha_i + \eta_{i,0} PubCount_{i,t} + \eta_{i,1} PubCount_{i,t} \times Post_t + \eta_{i,2} Post_t + \epsilon_{it} \tag{A.4}$$

In additional specifications, we use the 2-day moving average of *PubCount* to allow for a delayed effect of publications that came out after market-close. *Post* is defined as before. Publications are informative pre-run if η_0 is significant. Further, during the run, assuming that news is bad on average, we expect that $\eta_1 < 0$, especially for *Event* banks.

Endogeneity of *Pubcount* *Pubcount* may itself respond to past returns. To address this issue, we follow Jordà (2023) and add the lagged return to a local projection. For h=0, 1, ..., H, we estimate:

$$AR_{i,t+h} = \alpha_{i,h} + \gamma_{i,h} AR_{i,t-1} + \eta_{0,i,h} PubCount_{i,t} + \eta_{1,i,h} PubCount_{i,t} \times Post_t + \eta_{2,i,h} Post_t + \epsilon_{i,t+h} \tag{A.5}$$

Publications and beta. We augment specification 1 and interact *PubCount* with the factors (effectively making the factor betas varying with time, as in Avramov and Chordia (2006), as well as across banks). All regression variables are standardized.

$$\begin{aligned} Y_{i,t} = \alpha_i + \beta_1 PubCount_{i,t} \times Pre_t + \beta_2 Factor_t \times Pre_t \\ + \beta_3 Factor_t \times PubCount_{i,t} \times Pre_t \\ + \gamma_1 PubCount_{i,t} \times Post_t + \gamma_2 Factor_t \times Post_t \\ + \gamma_3 Factor_t \times PubCount_{i,t} \times Post_t \\ + \sum_{j=1}^{5} \delta_j FF_{j,t} + \delta_6 Log(MVE)_{i,t-1} + \delta_7 Post_t + \epsilon_{it} \end{aligned} \tag{A.6}$$

In additional specifications, we use 2-day and 3-day moving averages of $PubCount$. If news coordinates investor actions, then we expect that β_3 or γ_3 to be significant. The sign depends on whether the news is risk decreasing (increasing), implying a negative (positive) sign. During the run, we expect that $\gamma_3 > 0$.

Cross-section of news betas. To examine the cross-section distribution of the news betas (i.e., β_3 and γ_3), we re-estimate specification (A.6) bank-by-bank using PubCountMA2, the 2-day moving average of $Pubcount$, but replace the interaction terms involving Pre:

$$\begin{aligned} Y_{i,t} = \alpha_i &+ \beta_{i,1} PubCountMA2_{i,t} + \beta_{i,2} Factor_t \\ &+ \beta_{i,3} Factor_t \times PubCountMA2_{i,t} \\ &+ \gamma_{i,1} PubCountMA2_{i,t} \times Post_t + \gamma_{i,2} Factor_t \times Post_t \\ &+ \gamma_{i,3} Factor_t \times PubCountMA2_{i,t} \times Post_t \\ &+ \sum_{j=1}^{5} \delta_{i,j} FF_{j,t} + \delta_{i,6} Log(MVE)_{i,t-1} + \delta_{i,7} Post_t + \epsilon_{it} \end{aligned} \tag{A.7}$$

Since the event banks are known to experience negative news, we expect that $\gamma_3 >0$ for most event banks but insignificant for most STBs: news will have a stronger effect on the betas of more event banks as compared to the STBs.

A.3.4 Ratings and Beta

Informativeness of ratings. For each bank, we estimate rating announcement day returns using regressions of bank abnormal returns $AR_{i,t}$ on announcement dummies as follows:

$$AR_{i,t} = \alpha_i + \eta_0 Day0_{i,t} + \gamma_0 Day[1,3]_{i,t} + \epsilon_{it} \tag{A.8}$$

The regression is estimated separately for the March (using the March sample) and April announcements (using the April sample). Since banks have different announcement days, we estimate the April regression in *event time*. $Day0$ and Day[1,3] are dummy variables equal to 1 on the day of and 3 trading days after the announcement date, respectively. Hypothesis 2 implies that $\eta_0 < 0$ and significant for banks in the *March DGW* (*April Only DG*) group in March (April).

Ratings and coordination To test for coordination on the announcements, we test whether the betas of event banks increased just after announcements and not before. We estimate the following regression bank-by-bank before and after announcements:

$$\begin{aligned} Y_{i,t} = \alpha_i &+ \beta_{i,0} Factor_t + \sum_{k=1}^{5} \beta_{i,k} Period_{k,t} \times Factor_t \\ &+ \sum_{k=1}^{5} \zeta_{i,k} Period_{k,t} + \sum_{j=1}^{5} \delta_{i,j} FF_{j,t} + \delta_{i,6} Log(MVE)_{i,t-1} + \epsilon_{it} \end{aligned} \tag{A.9}$$

where $Period_{k,t}$ are dummy variables equal to 1 during these 5 periods: 10 trading days before and after the March and April announcements, and sample days omitted from these periods. January-February is the reference period. Thus, for banks put on downgrade watch on March 14, the periods are February 27-March 13 ($k = 1$) and March 14 - 27 ($k = 2$). For banks downgraded in April, since the first downgrade occurs on April 14, the pre-event period is March 31 – April 13 ($k = 3$). The post-event period ($k = 4$) is d to $d+9$ days, where d is the downgrade date (April 14, 19 or 21). $k = 5$ indicates the omitted periods: March 27-30 for all banks and, in addition, April 27-May 5 for banks with April 14 announcements, April 14-18 and May 2-5 for banks with April 19 announcements, April 14-20 and May 4-5 for banks with April 21 announcements.

A.3.5 BTFP Effects

Informativeness of BTFP A variation of specification A.8 is used to estimate the effects of the BTFP announcement. The announcement week is March 13-17, denoted Day[0,4], and we use 3 lags of the dependent variable. And we use the week after announcement, Day[5,9] instead of Day[1,3]. The following regression is estimated for each bank.

$$AR_{i,t} = \alpha_i + \sum_{k=1}^{3} AR_{i,k} + \eta_0 Day[0,4]_{i,t} + \gamma_0 Day[5,9]_{i,t} + \epsilon_{it} \tag{A.10}$$

BTFP and Beta: Panel regression We estimate the following regression for February 27-March 24:

$$\begin{aligned} Y_{i,t} = \alpha_i + \gamma Post_t + \beta_1 Factor_t + \beta_2 Factor_t \times Post_t + \beta_3 Factor_t \times OMO_{i,22q4} \\ + \beta_4 Factor_t \times OMO_{i,22q4} \times Post_t + \sum_{j=1}^{5} \delta_j FF_{j,t} + \delta_6 Log(MVE)_{i,t-1} + \epsilon_{it} \end{aligned} \tag{A.11}$$

Y is the bank's excess returns. $Post_t$ equals 1 from March 13-24. OMO is either unrealized losses or holdings of OMO-eligible securities as of 2022Q4. $\beta_4 < (>)0$ implies banks with higher OMO have lower (higher) betas post-BTFP announcement.

BTFP announcement and Beta: cross-section regressions To examine the cross-section of betas post-BTFP, we first estimate the following regression for each bank from February 27 to March 24. Then we compare the mean of $\beta_{1,2}$ of banks with above- versus below-median levels of OMO losses or securities as of 2022Q4.

$$Y_{i,t} = \alpha_i + \beta_{i,1} Factor_t + \beta_{i,2} Factor_t \times Post_t + \sum_{j=1}^{5} \delta_{i,j} FF_{j,t} + \delta_{i,6} Log(MVE)_{i,t-1} + \delta_{i,7} Post_t + \epsilon_{it} \tag{A.12}$$

Post=1 from March 13 to March 24.

BTFP/DW borrowings and Beta: cross-section regressions To examine the cross-section of betas post-BTFP or post-DW borrowings, we estimate the following regression from February 27 to April 13.

$$Y_{i,t} = \alpha_i + \gamma Post_{i,t} + \beta_1 Factor_t + \beta_2 Factor_t \times Post_{i,t} + \beta_3 Factor_t \times Borrow_i + \beta_4 Factor_t \times Borrow_i \times Post_{i,t} + \sum_{j=1}^{5} \delta_{i,j} FF_{j,t} + \delta_6 Log(MVE)_{i,t-1} + \epsilon_t \quad \text{(A.13)}$$

$Borrow_i$=1 if a bank i borrowed at the BTFP or the DW. $Post_{i,t}$ equals 1 in the 10 days after bank i *first* borrows from the BTFP (Panel A) or the DW (Panel B). Non-borrowing banks ($Borrow_i$=0) are assumed to first borrow on March 13.

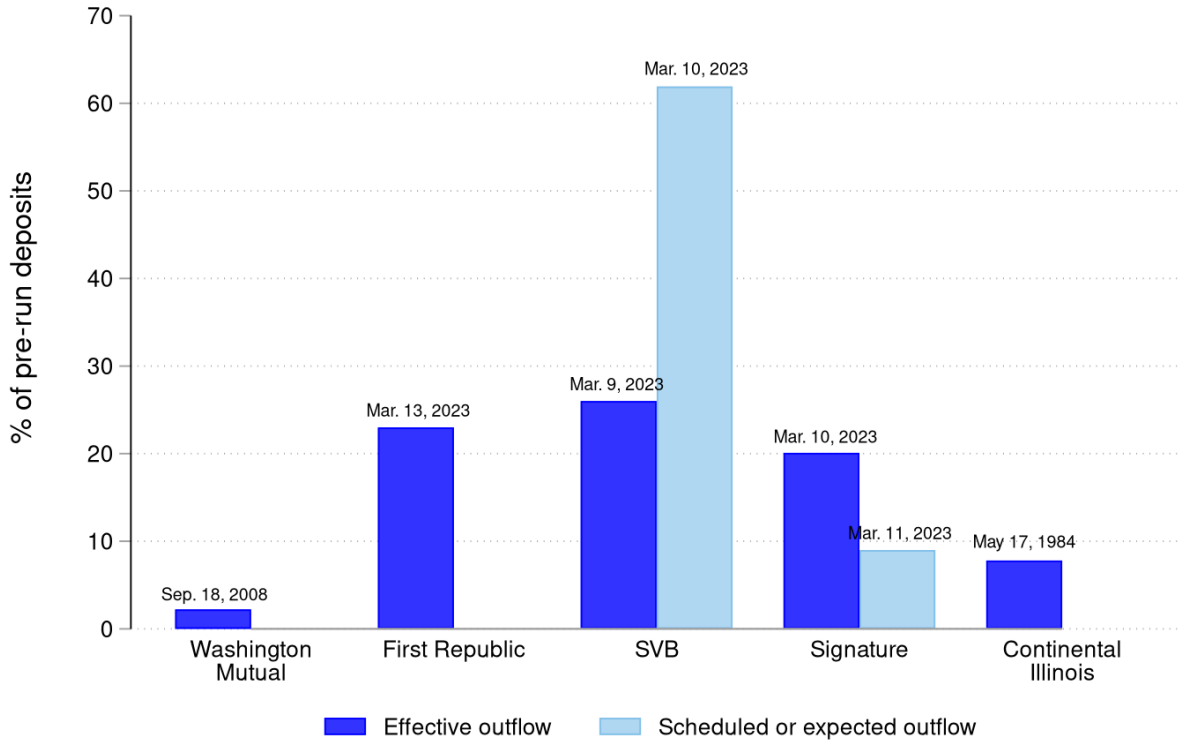
Internet Appendices

September 22, 2025

A Internet Appendix IA: Bank Group Members

IA.1 Peak Deposit Withdrawals During Bank Runs

Figure IA.1: **Peak 1-Day Deposit Withdrawal Rates**



Note: The figure shows the 1-day peak deposit withdrawals as a percent of pre-run deposits, and the associated dates, for select banks during the March 2023 bank run, and for Continental Illinois and Washington Mutual. Banks are sorted by inflation adjusted assets from left (highest) to right (lowest). The data is from FRB (2023) and Rose (2023).

IA.2 Bank Group Members

IA.2.1 March Downgrade Watch

Banks in the KBW index or the regional banking Index (KRX) as of Jan. 2023 are marked with an asterisk next to their names.

1. First Republic Bank (FRC): placed on downgrade watch on March 14 and its preferred stock rating downgraded on April 21 by Moody's; failed on May 1.
2. Zions Bancorporation, National Association (ZION): placed on downgrade watch on March 14 and downgraded on April 21 by Moody's.
3. Comerica Incorporated (CMA): placed on downgrade watch on March 14 and downgraded on April 21 by Moody's.
4. UMB Financial Corporation* (UMBF): placed on downgrade watch on March 14 and downgraded on April 21 by Moody's.
5. Western Alliance Bancorporation (WAL): placed on downgrade watch on March 14 and downgraded on April 21 by Moody's.

IA.2.2 April Only Downgrades

Banks in the KBW index or the regional banking Index (KRX) as of Jan. 2023 have an asterisk next to their names.

1. PacWest Bancorp* (PACW): downgraded by Fitch on April 14.
2. The Charles Schwab Corporation (SCHW): downgraded by S&P on April 19.
3. US Bancorp (USB): downgraded by Moody's on April 21.
4. Associated Banc-Corp* (ASB): downgraded by Moody's on April 21.
5. Banks of Hawaii Corporation* (BOH): downgraded by Moody's on April 21.
6. First Hawaiian, Inc.* (FHB): downgraded by Moody's on April 21.
7. Washington Federal, Inc.* (WAFD): downgraded by Moody's on April 21.

There were 6 other banks downgraded by Moody's on April 21, of which one is not publicly traded (Intrust), and five others (FRC, Zions, Comerica, UMB Financial, and Western Alliance) are in the March downgrade watch group.

IA.2.3 Non-event index banks

Our sample contains 38 index regional banks not in the March downgrade watch or April Only Downgrades group, consisting of those that were listed in the KRX index as of Jan. 2023.

1. First Financial Bancorp. (FFBC)
2. CVB Financial Corp. (CVBF)
3. Brookline Bancorp, Inc. (BRKL)
4. Hope Bancorp, Inc. (HOPE)
5. Glacier Bancorp, Inc. (GBCI)
6. First Citizens BancShares, Inc. (FCNC.A)
7. Hancock Whitney Corporation (HWC)
8. Eastern Bankshares, Inc. (EBC)
9. Fulton Financial Corporation (FULT)
10. United Community Banks, Inc. (UCBI)
11. Cullen/Frost Bankers, Inc. (CFR)
12. First Interstate BancSystem, Inc. (FIBK)
13. SouthState Corporation (SSB)
14. Synchrony Financial (SYF)
15. Independent Bank Corp. (INDB)
16. Old National Bancorp (ONB)
17. Cadence Bank (CADE)
18. Prosperity Bancshares, Inc. (PB)
19. BOK Financial Corporation (BOKF)
20. Commerce Bancshares, Inc. (CBSH)
21. Home Bancshares, Inc. (HOMB)
22. Pacific Premier Bancorp, Inc. (PPBI)
23. Ameris Bancorp (ABCB)
24. First Commonwealth Financial Corporation (FCF)

25. BankUnited, Inc. (BKU)
26. Texas Capital Bancshares, Inc. (TCBI)
27. Bank OZK (OZK)
28. Simmons First National Corporation (SFNC)
29. Synovus Financial Corp. (SNV)
30. First Financial Bankshares, Inc. (FFIN)
31. Atlantic Union Bankshares Corporation (AUB)
32. Trustmark Corporation (TRMK)
33. Pinnacle Financial Partners, Inc. (PNFP)
34. Cathay General Bancorp (CATY)
35. Wintrust Financial Corporation (WTFC)
36. WSFS Financial Corporation (WSFS)
37. F.N.B. Corporation (FNB)
38. United Bankshares, Inc. (UBSI)

IA.2.4 STBs

This group includes 21 of the 34 banks that were part of the 2022 Federal Reserve stress tests that were also in the KBW index and not in the March downgrade watch or April Only Downgrades.[24]

1. Ally Financial Inc. (ALLY)
2. American Express Company (AXP)
3. Bank of America Corporation (BAC)
4. Bank of Mellon New York Corporation (BK)
5. Capital One Financial Corporation (COF)
6. Citigroup Inc.(C)
7. Citizens Financial Group, Inc. (CFG)
8. Discover Financial Services (DFS)

[24]For the full list of STBs see Table 2 of "2022 Federal Reserve Stress Test Results," available at 2022 stress test results.

9. Fifth Third Bancorp (FITB)
10. Goldman Sachs Group, Inc. (GS)
11. Huntington Bancshares Incorporated (HBAN)
12. JPMorgan Chase & Co. (JPM)
13. Keycorp (KEY)
14. M&T Bank Corporation (MTB)
15. Morgan Stanley (MS)
16. Northern Trust Corporation (NTRS)
17. PNC Financial Services Group, Inc. (PNC)
18. Regions Financial Corporation (RF)
19. State Street Corporation (STT)
20. Truist Financial Corporation (TFC)
21. Wells Fargo & Company (WFC)

IB Internet Appendix B: Crisis Effects on Bank Betas

Table IB.1: **Characteristics of Failed Banks: 2022Q3 and 2022Q4**

Bank Name	Assets $B	Unins. Dep. % of Assets	Losses % of Assets	Cash % of Assets	CET1 %	Excess Ret. %
Panel A: 2022Q3						
SBNY	114.47	78.65	2.87	10.12	10.11	-0.17
SI	15.47	76.31	6.58	12.20	40.72	0.16
SIVB	212.87	71.07	8.79	6.32	12.13	0.06
Panel B: 2022Q4						
SBNY	110.36	69.47	2.91	5.49	10.41	-0.26
SI	11.36	32.66	1.00	40.28	42.12	-1.48
SIVB	211.79	69.60	8.35	6.14	12.05	-0.35

Note: The table shows the median values of balance sheet characteristics for the 3 banks that failed during our sample (SVB, SBNY, SI), reported as of 2022Q3 and 2022Q4. *Losses* are differences between par and fair values of AFS and HTM securities. *Unin.Dep.* = Uninsured Deposits. *Ret.* = returns.

Table IB.2: **Bank Balance Sheet Factor Betas: Including Crisis Effects on Fama-French and Bank MVE**

	Factor=UID		Factor=Losses		Factor=Cash		Factor=CET1	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Factor*Pre	0.02	0.06	0.02	0.06	0.17***	0.06	0.03	0.07
Factor*Post	0.19***	0.05	0.19***	0.04	0.24***	0.05	0.19***	0.05
Mkt-Rf	0.32***	0.06	0.32***	0.06	0.29***	0.05	0.32***	0.05
SMB	0.18***	0.04	0.18***	0.04	0.14***	0.04	0.18***	0.04
HML	0.12	0.08	0.13	0.08	0.10	0.06	0.13	0.08
RMW	0.06	0.06	0.06	0.06	0.02	0.05	0.06	0.06
CMA	0.00	0.08	-0.01	0.08	0.02	0.07	-0.01	0.08
Log Bank MVE_Lag1	-0.19***	0.05	-0.19***	0.05	-0.21***	0.05	-0.19***	0.05
Post	-0.28***	0.07	-0.31***	0.07	-0.32***	0.06	-0.30***	0.07
Mkt-Rf*Post	0.00	0.07	0.05	0.07	0.02	0.07	0.04	0.07
SMB*Post	-0.05	0.06	-0.05	0.06	-0.05	0.06	-0.03	0.07
HML*Post	0.32***	0.11	0.29***	0.10	0.37***	0.09	0.26**	0.11
RMW*Post	-0.06	0.09	-0.07	0.08	-0.07	0.07	-0.04	0.09
CMA*Post	-0.34***	0.10	-0.25**	0.10	-0.28***	0.11	-0.27***	0.10
Log Bank MVE_Lag1*Post	0.12*	0.07	0.12*	0.06	0.12*	0.06	0.12*	0.07
Wald Test: Factor*Pre=Factor*Post								
P-value	0.03		0.01		0.38		0.04	
Obs	24134		24134		24134		24134	
Adj R2	0.51		0.50		0.52		0.50	
Bank FE	YES		YES		YES		YES	

Note: This table shows results from estimating the following panel regression from January 3 to May 5, 2023:

$$
\begin{aligned}
Y_{i,t} = \alpha_0 + \alpha_i + \beta_1 Pre_t \times Factor_t + \beta_2 Post_t \times Factor_t \\
+ \sum_{j=1}^{5} \delta_j FF_{j,t} + \delta_6 Log(MVE)_{i,t-1} \\
+ \sum_{j=7}^{11} \delta_j FF_{j,t} \times Post_t + \delta_{12} Log(MVE)_{i,t-1} \times Post_t + \gamma Post_t + \epsilon_{it}
\end{aligned}
$$

Y is the bank's excess returns. The dummy variables *Pre* (*Post*) equal 1 before (since) March 1, 2023. The factors are constructed from long-short portfolios based on 2022Q3 asset shares of uninsured deposits (UID), unrealized losses on AFS and HTM securities (*Losses*), cash as shares of assets, and the common equity tier one ratio CET1. The *negative* of the cash and CET1 factor returns is used for consistency with the other factors. Downgraded and failed banks are excluded from the factor construction; the latter also dropped from the sample. All variables are standardized to have mean zero and unit standard deviation. Standard errors are robust and clustered by date. Stars represent statistical significance: *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Table IB.3: **Bank Balance Sheet Factor Betas: Including Crisis Effects on Liquidity of Bank Stocks**

	Factor=UID		Factor=Losses		Factor=Cash		Factor=CET1	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Factor*Pre	0.02	0.06	0.02	0.06	0.17***	0.06	0.03	0.07
Factor*Post	0.19***	0.05	0.19***	0.04	0.24***	0.05	0.19***	0.05
Mkt-Rf	0.32***	0.06	0.32***	0.06	0.29***	0.05	0.32***	0.05
SMB	0.18***	0.04	0.18***	0.04	0.14***	0.04	0.18***	0.04
HML	0.12	0.08	0.13	0.08	0.10	0.06	0.13	0.08
RMW	0.06	0.06	0.06	0.06	0.02	0.05	0.06	0.06
CMA	0.00	0.08	-0.01	0.08	0.02	0.07	-0.01	0.08
Log Bank MVE_Lag1	-0.20***	0.05	-0.19***	0.05	-0.21***	0.05	-0.19***	0.05
Post	-0.29***	0.07	-0.31***	0.07	-0.32***	0.06	-0.30***	0.07
Mkt-Rf*Post	0.00	0.07	0.05	0.07	0.02	0.07	0.04	0.07
SMB*Post	-0.05	0.06	-0.05	0.07	-0.05	0.06	-0.03	0.07
HML*Post	0.32***	0.11	0.29***	0.10	0.37***	0.09	0.26**	0.11
RMW*Post	-0.06	0.09	-0.07	0.08	-0.07	0.07	-0.04	0.09
CMA*Post	-0.34***	0.10	-0.25***	0.10	-0.28***	0.11	-0.27***	0.10
Log Bank MVE_Lag1*Post	0.12*	0.06	0.12*	0.06	0.12*	0.06	0.12*	0.07
Bid-Ask Spread	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Turnover	0.00	0.13	0.00	0.13	-0.03	0.13	0.00	0.13
Amihud ratio	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Bid-Ask Spread*Post	0.06***	0.02	0.06***	0.02	0.06***	0.02	0.06***	0.02
Turnover*Post	-0.02	0.13	-0.02	0.13	0.00	0.13	-0.02	0.13
Amihud ratio*Post	-0.05	0.04	-0.04	0.04	-0.04	0.04	-0.05	0.05
Wald Test: Factor*Pre=Factor*Post								
P-value	0.03		0.01		0.39		0.05	
Obs	24134		24134		24134		24134	
Adj R2	0.50		0.50		0.51		0.50	
Bank FE	YES		YES		YES		YES	

Note: This table shows results from estimating the following panel regression from January 3 to May 5, 2023:

$$
\begin{aligned}
Y_{i,t} = {} & \alpha_0 + \alpha_i + \beta_1 Pre_t \times Factor_t + \beta_2 Post_t \times Factor_t \\
& + \sum_{j=1}^{5} \delta_j FF_{j,t} + \delta_6 Log(MVE)_{i,t-1} + \gamma Post_t \\
& + \sum_{j=7}^{11} \delta_j FF_{j,t} \times Post_t + \delta_{12} Log(MVE)_{i,t-1} \times Post_t \\
& + \delta_{13} \Delta BidAsk_{i,t} + \delta_{14} Turnover_{i,t} + + \delta_{15} Amihud_{i,t} \\
& + \delta_{13} \Delta BidAsk_{i,t} \times Post_t + \delta_{14} Turnover_{i,t} \times Post_t + \delta_{15} Amihud_{i,t} \times Post_t + \epsilon_{it}
\end{aligned}
$$

Y is the bank's excess returns. The dummy variables *Pre* (*Post*) equal 1 before (since) March 1, 2023. The factors are constructed from long-short portfolios based on 2022Q3 asset shares of uninsured deposits (UID), unrealized losses on AFS and HTM securities (*Losses*), cash as shares of assets, and the common equity tier one ratio CET1. The *negative* of the cash and CET1 factor returns is used for consistency with the other factors. Downgraded and failed banks are excluded from the factor construction; the latter also dropped from the sample. All variables are standardized to have mean zero and unit standard deviation. Standard errors are robust and clustered by date. Stars represent statistical significance: $^*p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table IB.4: **Bank Balance Sheet Factor Betas: Including Controls for Macro and Market Risk and Bank Stock Liquidity**

	Factor=UID		Factor=Losses		Factor=Cash		Factor=CET1	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Factor*Pre	0.01	0.06	0.01	0.06	0.23***	0.05	-0.01	0.07
Factor*Post	0.18***	0.03	0.19***	0.03	0.23***	0.03	0.20***	0.04
Mkt-Rf	0.23***	0.05	0.24***	0.05	0.15***	0.04	0.24***	0.05
SMB	0.17***	0.03	0.16***	0.03	0.11***	0.02	0.17***	0.03
HML	0.20**	0.08	0.17**	0.07	0.12**	0.06	0.16**	0.08
RMW	0.07*	0.04	0.06*	0.04	0.01	0.03	0.08**	0.04
CMA	-0.12*	0.06	-0.07	0.06	-0.03	0.05	-0.08	0.06
KBW returns	0.14	0.08	0.14*	0.08	0.26***	0.06	0.13	0.08
VIX	-0.08	0.05	-0.09*	0.05	-0.07*	0.04	-0.08*	0.05
Corp Bond Spread	0.02	0.04	0.02	0.04	0.00	0.03	0.02	0.04
Treasury Spread	0.09***	0.03	0.09***	0.03	0.06**	0.03	0.09***	0.03
Inflation	-0.01	0.03	0.00	0.03	0.00	0.02	-0.01	0.03
Bid-Ask Spread	0.03*	0.01	0.03*	0.01	0.03*	0.01	0.03*	0.01
Turnover	-0.02	0.02	-0.02	0.02	-0.02	0.02	-0.02	0.02
Amihud ratio	-0.01	0.02	-0.01	0.02	-0.01	0.02	-0.01	0.02
Log Bank MVE_Lag1	-0.08**	0.03	-0.08**	0.03	-0.09***	0.03	-0.08**	0.03
Post	-0.18**	0.07	-0.20***	0.07	-0.16**	0.07	-0.20***	0.08
Wald Test: Factor*Pre=Factor*Post								
P-value	0.01		0.00		0.93		0.00	
Obs	23852		23852		23852		23852	
Adj R2	0.50		0.50		0.52		0.50	
Bank FE	YES		YES		YES		YES	

Note: This table shows results from estimating the following panel regression from January 3 to May 5, 2023:

$$
\begin{aligned}
Y_{i,t} = \alpha_0 + \alpha_i + \beta_1 Pre_t \times Factor_t + \beta_2 Post_t \times Factor_t + \sum_{j=1}^{5} \delta_j FF_{j,t} \\
+ \delta_6 Log(MVE)_{i,t-1} + \delta_7 KBW_{i,t} + \delta_8 \Delta Vix_{i,t} \\
+ \delta_9 \Delta CorpBondSpread_{i,t} + \delta_{10} \Delta TsyBondSpread_{i,t} + \delta_{11} Inflation_{i,t} \\
+ \delta_{12} \Delta BidAsk_{i,t} + \delta_{13} Turnover_{i,t} + + \delta_{14} Amihud_{i,t} + \gamma Post_t + \epsilon_{it}
\end{aligned}
$$

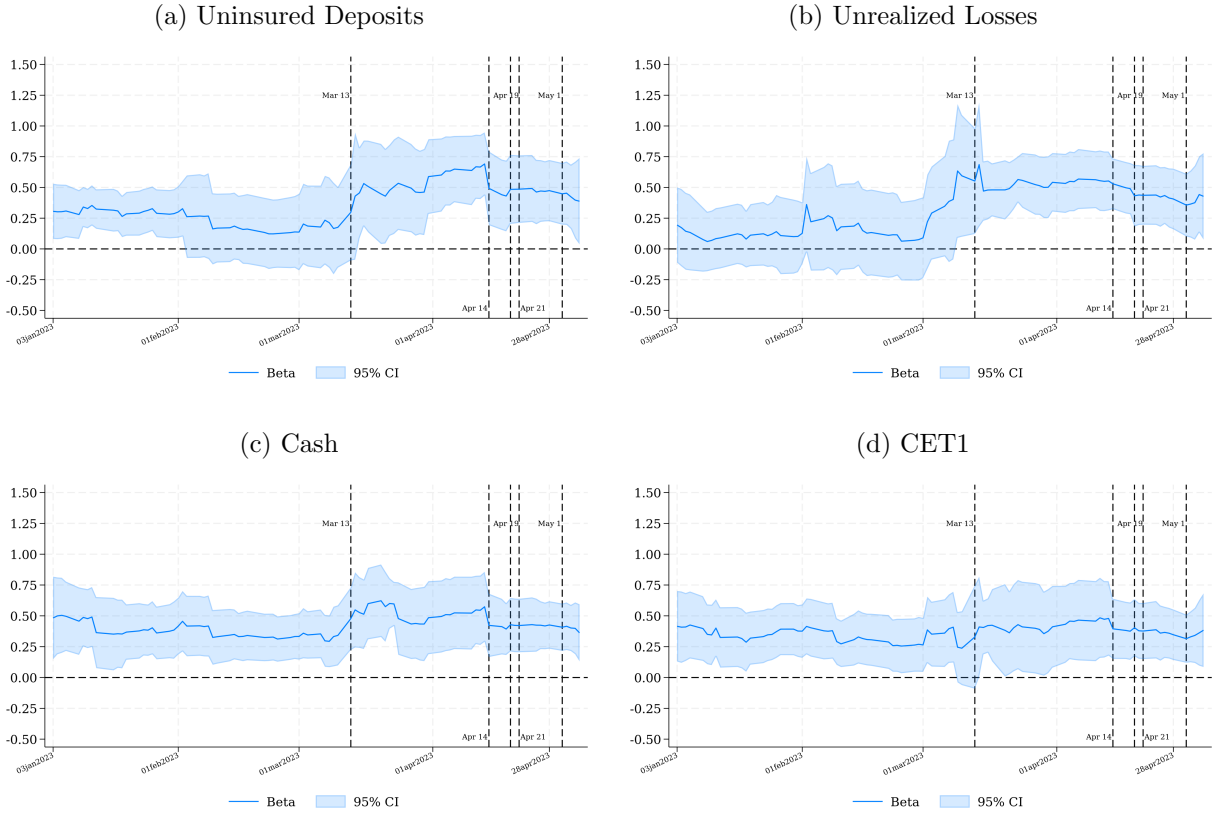
Y is the bank's excess returns, KBW is the return on the KBW bank index, $CorpBondSpread$ is Moody's Baa corporate bond yield minus the 10-year Treasury Constant Maturity Yield, $TsyBondSpread$ is the 10-year minus 3-month Treasury Constant Maturity yields, $Inflation$ is the 5-year break-even inflation rate, and, from banks' stock trading, $BidAsk$ is the bid-ask spread, $Turnover$ is the volume divided by shares outstanding and $Amihud$ is the absolute return divided by volume. The dummy variables *Pre* (*Post*) equal 1 before (since) March 1, 2023. The factors are constructed from long-short portfolios based on 2022Q3 asset shares of uninsured deposits (UID), unrealized losses on AFS and HTM securities (*Losses*), cash as shares of assets, and the common equity tier one ratio CET1. The *negative* of the cash and CET1 factor returns is used for consistency with the other factors. Downgraded and failed banks are excluded from the factor construction; the latter also dropped from the sample. All variables are standardized to have mean zero and unit standard deviation. Standard errors are robust and clustered by date. Stars represent statistical significance: $^*p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table IB.5: **Overlap of Banks in Factor Groups**

	CET1	Cash	Losses	UID
CET1	73	28	22	30
Cash	28	69	32	26
Losses	22	32	72	28
UID	30	26	28	67

Note: This table shows the degree of overlap in the long and short buckets for each factor. For the given factor pair, each cell shows number of banks that are in the long portfolio for both factors plus the number of banks that are in the short portfolio for both factors. The entries on the diagonals show the number of banks in the long portfolio plus the number of banks in the short portfolio for that particular factor.

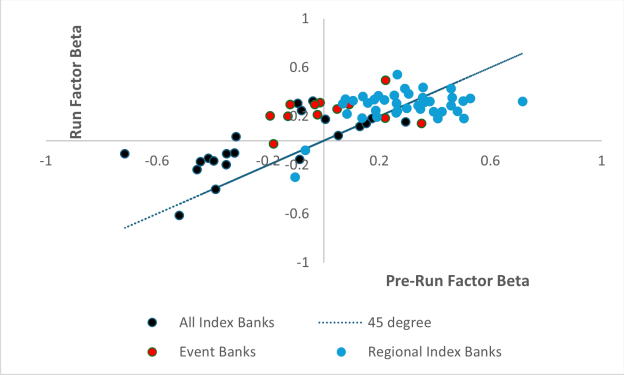
Figure IB.1: **Bank Balance Sheet Factor Betas in 2022**



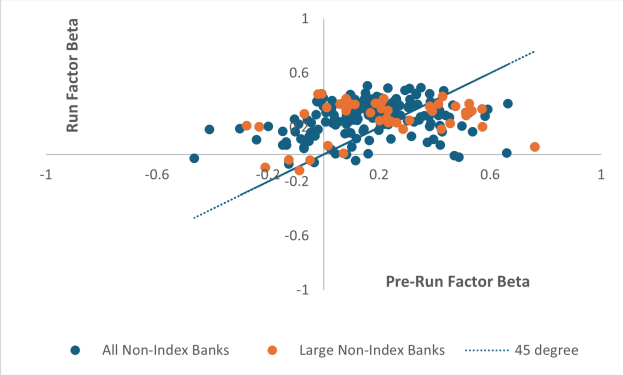
Note: This figure plots the factor beta coefficients and 95% confidence intervals from estimating regression 1 for a rolling window of 39 trading days from January to May 5 of 2023. x-axis dates represent the end date of the rolling window period. The factors are constructed using balance sheets from the quarter before the start of the rolling window and after the Call Report filing deadline (see Figure A.1). The first regression sample in the 2023 figures is from November 4, 2022 to January 3, 2023 and the last from March 14 to May 5, 2023. The vertical drop lines indicate the the day before the March downgrade watch (March 13, 2023), April downgrade events (April 14, 19, and 21 of 2023) and the failure of FRC. Observations for FRC are dropped since the date of its failure (May 1, 2023). Observations for SVB, SBNY, and Silvergate stock prices are dropped for the entire period. Standard errors (used to compute the 95% confidence interval) are robust and clustered by date.

Figure IB.2: **Cash and CET1 Betas Before and During the Run**

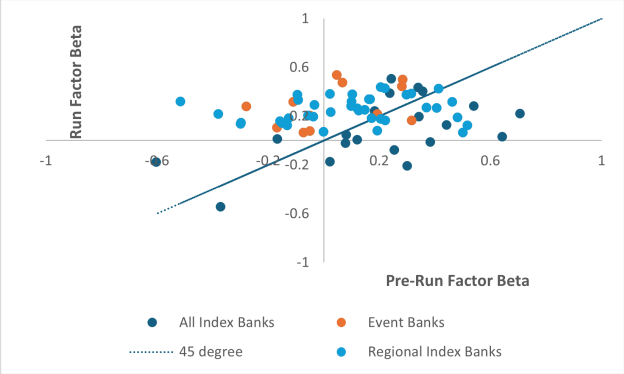
(a) *Cash*: Index and Event Banks



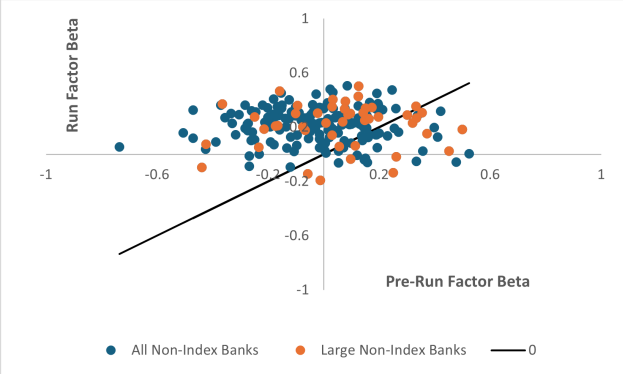
(b) *Cash*: Non-Index Banks



(c) *CET*1: Index and Event Banks



(d) *CET*1 Non-Index Banks



Note: These figures show scatter plots of *Cash* and *CET*1 factor beta estimates before the run (horizontal axis) versus during the run (vertical axis), obtained by estimating specification (A.3) bank-by-bank. Also shown is the 45-degree line. Colored dots indicate the estimates for the *event* banks (i.e., banks downgraded by rating agencies; red dots in left panel) or *index regional* banks (blue dots in left panel) or *Non-index regional Banks* (right panel). *Index* banks are part of the KBW or KRX indexes. *Non-index* banks are publicly-traded banks that are not included in these indexes. Non-index regional banks have assets of at least $10B. *UID* is the asset share of uninsured deposits. *Losses* is the asset share of unrealized losses on AFS and HTM securities.

IB.1 2022Q3 and 2022Q4 Balance Sheet Values, Excess Returns and Publication Counts, of Banks with Increases in Factor Betas During the Run

Do increases in beta during the run reflect bank risk in the cross-section? To answer this question, we report the median values of balance sheet characteristics, as well as average excess returns and *Pubcount*, in 2022Q3 of banks with significantly higher betas during the run. A Wilcoxon test is used to compare the medians and exact p-values are reported. The standard asymptotic p-values are likely invalid due to the small sample sizes. The computation of exact values is based on exact conditional inference for contingency tables (Agresti (1992)).

Table IB.6: **2022Q3 Risk of Banks with Increases in UID and *Losses* Betas During the Run**

Panel A: Factor=UID								
	N	Assets ($B)	Unin. Dep %	Losses %	Cash %	CET1 %	Eret %	Pubcount %
Index Banks, Sig Higher Beta	9	23.81	44.13**	3.44*	2.70*	10.25	0.05	6.62
All Other Index Banks	63	44.42	34.90	2.46	4.67	11.01	0.05	7.83
Event Banks, Sig Higher Beta	4	78.82	51.28	3.75	2.51*	9.44	-0.03	5.42
All Other Event Banks	8	39.73	40.36	3.39	5.82	9.90	-0.01	9.02
STBs, Sig Higher Beta	0							
All Other STBs	21	303.57	34.23	2.37	8.37	10.33	-0.04	7.33
Index Regionals, Sig Higher Beta	5	23.69	37.04	3.44	3.33	11.89	0.16	10.35
All Other Index Regionals	34	29.73	34.85	2.44	3.13	11.54	0.08	7.73
Non-Index Banks, Sig Higher Beta	45	5.06	31.36	2.17	3.70	12.66	0.02	23.72
All Other Non-Index Banks	165	5.02	32.53	2.13	3.19	11.92	-0.02	28.39
Non-Index Regionals, Sig Higher Beta	8	12.72	41.42	2.19	2.93	11.07	-0.06	20.73
All Other Non-Index Regionals	38	16.02	38.34	2.11	2.77	11.57	0.02	11.99
Small Non-Index Banks, Sig Higher Beta	37	4.26	30.31	2.17	3.86	12.72	0.02*	23.72*
All Other Small Non-Index Banks	127	3.52	31.30	2.14	3.39	12.01	-0.03	34.70
Panel B: Factor=Losses								
	N	Assets ($B)	Unin. Dep %	Losses %	Cash %	CET1 %	Eret %	Pubcount %
Index Banks, Sig Higher Beta	6	46.49	44.62**	4.01	3.98	10.00	0.03	6.93
All Other Index Banks	66	44.07	34.90	2.57	4.22	11.05	0.05	7.73
Event Banks, Sig Higher Beta	4	76.75	50.49	4.12	2.58	9.77	-0.01	6.93
All Other Event Banks	8	39.73	40.36	3.15	4.75	9.76	-0.01	7.65
STBs, Sig Higher Beta	0							
All Other STBs	21	303.57	34.23	2.37	8.37	10.33	-0.04	7.33
Index Regionals, Sig Higher Beta	2	21.90	37.59	2.35	5.34	10.97	0.21*	9.86
All Other Index Regionals	37	29.05	34.90	2.52	3.09	11.73	0.09	7.83
Non-Index Banks, Sig Higher Beta	42	5.37	32.14	2.17	3.09	11.95	-0.03	26.06
All Other Non-Index Banks	168	5.00	32.33	2.13	3.22	12.07	0.00	27.85
Non-Index Regionals, Sig Higher Beta	8	15.92	42.44*	1.21***	2.47	9.63***	-0.10**	11.04
All Other Non-Index Regionals	38	15.89	38.34	2.46	2.77	12.04	0.03	13.73
Small Non-Index Banks, Sig Higher Beta	34	4.32	31.30	2.38	3.58	12.70	-0.02	29.79
All Other Small Non-Index Banks	130	3.52	29.74	2.12	3.41	12.07	-0.02	32.61

Note: This table shows the median of balance sheet values, as well as of average excess returns and *Pubcount*, in 2022Q3 of banks with significant increases in their UID and *Losses* factor betas during the bank run. The ratios are reported as % of assets in 2022Q3. *Losses* are differences between par and fair values of AFS and HTM securities. *Index* banks are part of the KBW or KRX indexes. The *Event* banks were downgraded during the bank run. The *index regional bank (STB)* group consists of non-downgraded regional (US stress-tested) index banks. *Non-index* banks are publicly-traded banks that are not included in these indexes. Non-index regional banks have assets of at least $10B. ***(**)* indicate statistical significance at the 1%(5%)10% level based on a Wilcoxon test with exact computation of p-values. *DG*=Downgraded. *Unin. Dep.* = Uninsured Deposits. *Eret*=excess returns. *Sig*=Significant.

Table IB.7: **2022Q3 Risk of Banks with Increases in Cash and CET1 Betas During the Run**

Panel A: Factor=Cash								
	N	Assets ($B)	Unin. Dep %	Losses %	Cash %	CET1 %	Eret %	Pubcount %
Index Banks, Sig Higher Beta	10	86.41*	42.55**	3.64	3.93	9.71**	-0.03**	5.47*
All Other Index Banks	62	41.20	34.90	2.49	4.53	11.09	0.06	7.93
Event Banks, Sig Higher Beta	5	84.34	55.87*	3.68	5.69	9.65	-0.03	7.24
All Other Event Banks	7	38.05	42.96	2.95	3.29	9.86	0.05	6.62
STBs, Sig Higher Beta	3	225.14	39.51	3.61	3.82**	9.12**	-0.09	4.46
All Other STBs	18	365.76	31.42	2.26	9.66	10.68	-0.03	7.69
Regional Banks, Sig Higher Beta	2	50.21	43.05	3.33	3.03	13.86	0.03	5.47
All Other Regional Banks	37	26.73	34.91	2.52	3.18	11.35	0.10	8.03
Non-Index Banks, Sig Higher Beta	22	5.50	32.37	2.04	2.76	11.68	0.01	32.99
All Other Non-Index Banks	188	5.00	32.12	2.17	3.23	12.17	-0.02	26.48
Large Non-Index Banks, Sig Higher Beta	6	16.36	39.71	1.62	2.11	9.89*	-0.10	11.04
All Other Large Non-Index Banks	40	15.89	38.74	2.14	2.90	11.85	0.02	13.73
Small Non-Index Banks, Sig Higher Beta	16	4.46	28.68	2.32	4.85	12.49	0.02	35.96
All Other Small Non-Index Banks	148	3.60	31.01	2.17	3.41	12.24	-0.03	31.14
Panel B: Factor=CET1								
	N	Assets ($B)	Unin. Dep %	Losses %	Cash %	CET1 %	Eret %	Pubcount %
Index Banks, Sig Higher Beta	14	23.47*	39.21**	3.10	4.30	11.97**	0.02*	8.74*
All Other Index Banks	58	50.04	35.35	2.61	4.22	10.62	0.06	7.29
Event Banks, Sig Higher Beta	4	76.75	50.00*	4.26	4.63	10.68	0.01	5.74
All Other Event Banks	8	39.73	42.98	3.15	3.55	9.63	-0.01	8.11
STBs, Sig Higher Beta	1	1,555.99	10.98	0.35	18.05**	14.14**	0.00	37.84
All Other STBs	20	264.35	35.01	2.40	8.29	10.16	-0.04	6.94
Regional Banks, Sig Higher Beta	9	21.89	38.13	2.52	3.85	12.06	0.03	10.61
All Other Regional Banks	30	30.88	34.85	2.54	3.13	11.09	0.10	7.41
Non-Index Banks, Sig Higher Beta	50	4.99	31.47	2.27	2.86	11.79	0.00	26.99
All Other Non-Index Banks	160	5.08	32.57	2.11	3.45	12.21	-0.02	27.04
Large Non-Index Banks, Sig Higher Beta	8	12.67	36.58	2.09	2.50	11.07*	-0.04	20.73
All Other Large Non-Index Banks	38	16.23	38.74	2.11	2.83	11.57	0.02	11.74
Small Non-Index Banks, Sig Higher Beta	42	4.33	31.36	2.27	3.05	11.80	0.00	28.68
All Other Small Non-Index Banks	122	3.48	28.75	2.12	3.56	12.35	-0.03	34.12

Note: This table shows the median of balance sheet values, as well as of average excess returns and *Pubcount*, in 2022Q3 of banks with significant increases in their *Cash* and *CET*1 factor betas during the bank run. The ratios are reported as % of assets in 2022Q3. *Losses* are differences between par and fair values of AFS and HTM securities. *Index* banks are part of the KBW or KRX indexes. The *Event* banks were downgraded during the bank run. The *index regional bank (STB)* group consists of non-downgraded regional (US stress-tested) index banks. *Non-index* banks are publicly-traded banks that are not included in these indexes. Non-index regional banks have assets of at least $10B. ***(**)* indicate statistical significance at the 1%(5%)10% level based on a Wilcoxon test with exact computation of p-values. *DG*=Downgraded. *Unin.Dep.* = Uninsured Deposits. *Eret*=excess returns. *Sig*=Significant.

Table IB.8: **2022Q4 Risk of Banks with Increases in UID and *Losses* Betas During the Run**

Panel A: Factor=UID								
	N	Assets ($B)	Unin. Dep %	Losses %	Cash %	CET1	Pubcount %	Eret %
Index Banks, Sig Higher Beta	9	25.05	40.56**	3.16	2.15**	10.22	8.36	-0.02***
All Other Index Banks	63	46.77	34.28	2.30	4.08	11.00	8.08	0.12
Event Banks, Sig Higher Beta	4	78.64	48.98	2.08	1.86*	9.48	7.00	-0.03*
All Other Event Banks	8	40.32	40.10	3.19	4.90	9.96	12.28	0.13
STBs, Sig Higher Beta	0							
All Other STBs	21	301.45	31.70	2.23	7.99	10.60	7.86	0.14
Regional Banks, Sig Higher Beta	5	24.01	36.18	3.25	4.11	12.22	8.36	0.05
All Other Regional Banks	34	28.95	33.83	2.27	2.93	11.62	7.99	0.06
Non-Index Banks, Sig Higher Beta	45	5.03	30.51	1.99	2.48	12.10	27.95	0.11
All Other Non-Index Banks	165	5.15	30.27	1.89	2.39	12.03	32.55	0.12
Large Non-Index Banks, Sig Higher Beta	8	12.72	39.51	1.97	2.25	11.09	13.82	0.09
All Other Large Non-Index Banks	38	15.83	36.58	1.85	2.53	11.68	13.37	0.12
Small Non-Index Banks, Sig Higher Beta	37	4.28	29.73	1.99	2.78	12.49	33.46	0.12
All Other Small Non-Index Banks	127	3.61	28.58	1.91	2.34	12.22	37.37	0.12
Panel B: Factor=Losses								
	N	Assets ($B)	Unin. Dep %	Losses %	Cash %	CET1	Pubcount %	Eret %
Index Banks, Sig Higher Beta	6	46.49	41.14**	2.61	3.20	9.93	9.91	-0.02**
All Other Index Banks	66	44.07	34.31	2.41	3.92	11.04	8.01	0.11
Event Banks, Sig Higher Beta	4	76.75	47.46	2.61	1.97	9.82	9.91	-0.04**
All Other Event Banks	8	39.73	40.10	2.67	3.67	9.63	11.03	0.13
STBs, Sig Higher Beta	0							
All Other STBs	21	303.57	31.70	2.23	7.99	10.60	7.86	0.14
Regional Banks, Sig Higher Beta	2	21.90	35.24	2.20	4.31	11.04	12.75	0.04
All Other Regional Banks	37	29.05	34.77	2.47	2.81	11.69	8.08	0.05
Non-Index Banks, Sig Higher Beta	42	5.37	31.69*	1.92	2.44	11.78	23.33**	0.12
All Other Non-Index Banks	168	5.00	30.13	1.91	2.39	12.12	33.49	0.12
Large Non-Index Banks, Sig Higher Beta	8	15.92	40.51	1.06***	3.59	9.59***	10.27	-0.01***
All Other Large Non-Index Banks	38	15.89	36.58	2.15	2.35	12.03	14.01	0.13
Small Non-Index Banks, Sig Higher Beta	34	4.32	30.48	2.26	2.19	12.61	24.60**	0.15
All Other Small Non-Index Banks	130	3.52	28.83	1.86	2.39	12.22	38.58	0.12

Note: This table shows the median balance sheet values, as well as of average excess returns and *Pubcount*, in 2022Q3 of banks with significant increases in their UID and *Losses* factor betas during the bank run. The ratios are reported as % of assets in 2022Q3. *Losses* are differences between par and fair values of AFS and HTM securities. *Index* banks are part of the KBW or KRX indexes. The *Event* banks were downgraded during the bank run. The *index regional bank (STB)* group consists of non-downgraded regional (US stress-tested) index banks. *Non-index* banks are publicly-traded banks that are not included in these indexes. Non-index regional banks have assets of at least $10B. ***(**)* indicate statistical significance at the 1%(5%)10% level based on a Wilcoxon test with exact computation of p-values. *DG*=Downgraded. *Unin.Dep.* = Uninsured Deposits. *Eret*=excess returns. *Sig*=Significant.

Table IB.9: **2022Q4 Balance Sheet Values of Banks with Increases in Cash and CET1 Betas During the Run**

Panel A: Factor=Cash								
	N	Assets ($B)	Unin. Dep %	Losses %	Cash %	CET1 %	Eret %	Pubcount %
Index Banks, Sig Higher Beta	10	87.60*	41.13***	3.19	4.10	9.82**	0.01	7.26*
All Other Index Banks	62	41.60	33.59	2.33	3.92	11.16	0.10	8.33
Event Banks, Sig Higher Beta	5	85.65	53.20*	2.88	4.36	9.65	-0.02*	8.24
All Other Event Banks	7	39.41	39.44	2.46	2.14	9.92	0.11	13.82
STBs, Sig Higher Beta	3	227.09	39.32	3.70	3.83**	9.10**	0.17	4.66
All Other STBs	18	353.62	30.13	2.15	8.88	11.02	0.14	7.90
Index Regionals, Sig Higher Beta	2	50.91	43.62	3.26	3.39	14.28	0.08	6.47
All Other Index Regionals	37	27.46	34.77	2.47	3.05	11.54	0.05	8.30
Non-Index Banks, Sig Higher Beta	22	5.54	29.83	1.95	2.66	11.61	0.05	24.11
All Other Non-Index Banks	188	4.93	30.55	1.92	2.41	12.12	0.12	31.60
Non-Index Regionals, Sig Higher Beta	6	16.96	33.89	1.45	2.20	9.90**	0.07*	16.02
All Other Non-Index Regionals	40	15.67	37.15	1.92	2.53	11.94	0.12	13.37
Small Non-Index Banks, Sig Higher Beta	16	4.47	28.34	2.25	4.27	12.20	0.03	35.45
All Other Small Non-Index Banks	148	3.71	29.38	1.92	2.37	12.26	0.12	36.44
Panel B: Factor=CET1								
	N	Assets ($B)	Unin. Dep %	Losses %	Cash %	CET1 0	Eret %	Pubcount %
Index Banks, Sig Higher Beta	14	24.33**	36.90	2.85	2.86	12.21**	0.10	10.13
All Other Index Banks	58	50.81	34.55	2.41	4.03	10.61	0.08	7.92
Event Banks, Sig Higher Beta	4	76.69	47.46	4.16	4.02	10.46	-0.01	7.57
All Other Event Banks	8	40.32	40.66	2.41	2.61	9.50	0.09	11.74
STBs, Sig Higher Beta	1	1,441.80	14.48	0.34	16.81	15.02	0.27	34.11
All Other STBs	20	264.90	32.99	2.23	7.88	10.52	0.14	7.83
Index Regionals, Sig Higher Beta	9	21.95**	36.18	2.16	2.68	12.22*	0.12	10.11*
All Other Index Regionals	30	30.89	33.83	2.48	3.21	11.21	0.05	7.76
Non-Index Banks, Sig Higher Beta	50	5.01	30.38	2.09	2.31	11.67	0.12	29.47
All Other Non-Index Banks	160	5.37	30.43	1.86	2.46	12.24	0.12	31.87
Non-Index Regionals, Sig Higher Beta	8	12.72	35.35	1.82	2.04	11.09	0.12	14.00
All Other Non-Index Regionals	38	15.84	36.93	1.85	2.54	11.68	0.11	13.37
Small Non-Index Banks, Sig Higher Beta	42	4.46	30.06	2.09	2.33	11.70	0.12	33.00
All Other Small Non-Index Banks	122	3.61	28.33	1.86	2.44	12.33	0.12	38.58

Note: This table shows the median balance sheet values, as well as of average excess returns and *Pubcount*, in 2022Q3 of banks with significant increases in their *Cash* and *CET*1 factor betas during the bank run. The ratios are reported as % of assets in 2022Q3. *Losses* are differences between par and fair values of AFS and HTM securities. *Index* banks are part of the KBW or KRX indexes. The *Event* banks were downgraded during the bank run. The *index regional bank (STB)* group consists of non-downgraded regional (US stress-tested) index banks. *Non-index* banks are publicly-traded banks that are not included in these indexes. Non-index regional banks have assets of at least $10B. ***(**)* indicate statistical significance at the 1%(5%)10% level based on a Wilcoxon test with exact computation of p-values. *DG*=Downgraded. *Unin.Dep.* = Uninsured Deposits. *Eret*=excess returns. *Sig*=Significant.

Table IB.10: **Predicting Increases in Cash and CET1 Betas During the Run Using 2022Q3 Values**

Panel A: Cash Beta						
2022Q3 Values of:	Estimate	SE	Estimate	SE	Estimate	SE
Asset Growth	-0.06	0.12	-0.10	0.11	0.01	0.18
Net Income	0.06	0.22	0.06	0.21	0.42	0.39
Time Deposits	-0.68	0.50	-0.80	0.56	0.44	0.97
Net Income*Time Deposits	0.78	1.47	0.91	1.50	-3.66*	2.18
UID			0.17	0.29	-0.54	0.43
Losses			-0.80	4.84	-5.11	7.28
UID*Losses			0.00	0.13	0.17	0.19
Cash/Assets					-0.01	0.01
Average Excess Returns					-0.38*	0.20
CET1					-0.01	0.01
Intercept	0.14*	0.07	0.16	0.13	0.53**	0.24
Obs	282		282		282	
Adj R2	0.00		0.00		0.02	
Root MSE, All Banks	0.32		0.32		0.43	
Root MSE, Event Banks	0.56		0.54		0.57	
Root MSE, STBs	0.35		0.34		0.48	
Root MSE, Index Regional Banks	0.23		0.23		0.41	
Root MSE, Non-Index Regional Banks	0.35		0.34		0.41	
Root MSE, Small Non-Index Banks	0.30		0.30		0.41	
Panel B: CET1 Beta						
2022Q3 Values of:	Estimate	SE	Estimate	SE	Estimate	SE
Asset Growth	-0.04	0.13	-0.06	0.14	0.12	0.19
Net Income	0.18	0.31	0.19	0.33	0.66*	0.37
Time Deposits	-0.07	0.71	-0.08	0.76	1.38*	0.83
Net Income*Time Deposits	-0.54	1.95	-0.52	2.01	-4.87**	2.09
UID			0.09	0.39	-0.25	0.39
Losses			-0.48	5.97	0.60	6.92
UID*Losses			0.01	0.15	0.07	0.18
Cash/Assets					0.00	0.00
Average Excess Returns					-0.37*	0.19
CET1					-0.02**	0.01
Intercept	0.19*	0.11	0.19	0.21	0.21	0.21
Obs	282		282		282	
Adj R2	-0.01		-0.02		0.02	
Root MSE, All Banks	0.42		0.42		0.39	
Root MSE, Event Banks	0.47		0.47		0.61	
Root MSE, STBs	0.29		0.28		0.34	
Root MSE, Index Regional Banks	0.42		0.41		0.37	
Root MSE, Non-Index Regional Banks	0.39		0.39		0.36	
Root MSE, Small Non-Index Banks	0.43		0.43		0.38	

Note: The table shows results from a cross-section regression:

$$Y_{i,F} = \alpha_{0,F} + \sum_{j=1}^{10} \alpha_{i,j,F} X_{i,j,2022q3} + \epsilon_{i,F}$$

Y_i=1 if $bank_i$ experienced a significant increase in its factor beta F during the run, where F=$Cash$ (Panel A) or $CET1$ (Panel B). $X_{i,j}$ are measured as of 2022Q3 and include: asset growth, asset shares of net income, deposits, cash and uninsured deposits UID, the share time deposits in total deposits, *Losses*, CET1, and average excess stock returns. *Losses* are differences between par and fair values of AFS and HTM securities. *Index* (*Non-index*) are publicly-traded banks included (not included) in the KBW or KRX indexes. *Event banks* were downgraded in April 2023. The *index regional* (STB) group consists of non-downgraded regional (US stress-tested) index banks. Non-index regional banks have assets of at least $10B. We report heteroscedasticity-consistent standard errors (SE) based on MacKinnon and White (1985). ***(**)* indicate statistical significance at the 1%(5%)10% level.

IC Internet Appendix IC: Publication Counts

Table IC.1: **Bank Publication Counts in 2022Q4 and OMO Shares in 2022Q3**

Panel A: OMO, 2022Q3							
Bank Group	Number	Mean	Min	P25	P50	P75	Max
All Sample Banks	71	16.99	1.76	10.06	16.37	23.02	53.82
April Only DG	7	23.65	6.73	10.06	23.05	32.14	53.82
March DGW	5	15.10	2.54	5.16	21.72	21.76	24.34
STBs	21	17.01	1.76	13.05	17.03	21.69	30.20
Regional Banks	38	16.01	4.11	8.69	15.06	21.28	38.76
SBNY	1	20.21	20.21	20.21	20.21	20.21	20.21
SI	1	48.50	48.50	48.50	48.50	48.50	48.50
SIVB	1	52.12	52.12	52.12	52.12	52.12	52.12
Panel B: PUBCOUNT, 2022Q4							
Bank Group	Number	Mean	Min	P25	P50	P75	Max
All Sample Banks	71	14.78	0.18	3.56	6.39	15.43	316.14
April Only DG	7	18.87	0.36	4.24	8.14	20.34	288.89
March DGW	5	8.38	0.47	1.48	3.50	8.86	101.27
STBs	21	10.40	0.18	2.69	5.92	13.74	269.32
Regional Banks	38	17.29	0.91	3.83	7.04	17.60	316.14
SBNY	1	6.31	0.91	1.81	3.62	7.25	36.24
SI	1	182.33	8.81	44.03	140.90	281.80	651.66
SIVB	1	6.55	0.47	2.83	4.72	7.08	53.83

Note: The table shows the distribution of the asset share of OMO collateral in 2022Q3 (Panel A) and 100*publication counts, normalized by assets in $B, in 2022Q4 (Panel B). SVB, SBNY, Silvergate are not in the sample but shown for reference. The *March DGW* group includes banks put on DG watch in March. The *April Only DG Banks* group includes banks downgraded between April 14 and 28. The *index regional banks* (STB) group consists of non-DG regional (US stress-tested) banks. *DG*=Downgraded.

Table IC.2: **Effect of Lagged Returns and Lagged News on Bank Abnormal Returns: Before and during the run**

Panel A: 2 Day Moving Average of Pubcount, 1-Day Lagged Return							
	N	Avg η_0	% η_0 >0 & p<=0.05	% η_0 <0 & p<=0.05	Avg η_1	% η_1 >0 & p<=0.05	% η_1 <0 & p<=0.05
All Banks	282	-0.01	14.54	16.67	-0.09	14.18	10.99
All index Banks	72	0.38	13.89	13.89	-0.84	13.89	13.89
Event Banks	12	-1.04	8.33	8.33	-0.34	8.33	16.67
STBs	21	2.96**	19.05	4.76	-5.89**	0.00	28.57
Regional Banks	39	-0.58	12.82	20.51	1.73	23.08	5.13
All Nonindex Banks	210	-0.14**	14.76	17.62	0.17	14.29	10.00
Large Non-Index	46	-0.09	19.57	21.74	-0.06	15.22	17.39
Small Non-Index	164	-0.16***	13.41	16.46	0.23***	14.02	7.93
Panel B: 2 Day Moving Average of Pubcount, 1-Day Lagged Return, 1-Day Lagged Pubcount							
	N	Avg η_0	% η_0 >0 & p<=0.05	% η_0 <0 & p<=0.05	Avg η_1	% η_1 >0 & p<=0.05	% η_1 <0 & p<=0.05
All Banks	282	0.18	11.35	11.70	-0.14	14.54	10.64
All index and Event Banks	72	0.96**	15.28	6.94	-0.97	11.11	12.50
Event Banks	12	0.13	8.33	0.00	0.25	16.67	25.00
STBs	21	2.60**	23.81	0.00	-3.41*	4.76	19.05
Index Regionals	39	0.34	12.82	12.82	-0.03	12.82	5.13
All Nonindex Banks	210	-0.08	10.00	13.33	0.14	15.71	10.00
Non-Index Regionals	46	0.00	13.04	4.35	-0.01	8.70	15.22
Small Non-Index	164	-0.11**	9.15	15.85	0.19**	17.68	8.54

Note: Panel A of the table summarizes results from estimating bank by bank this equation for January 1 to May 5, 2023:

$$AR_{i,t} = \alpha_i + \gamma_i AR_{i,t-1} + \eta_{i,0} PubCount_{i,t-1} + \eta_{i,1} PubCount_{i,t} \times Post_t + \eta_{i,2} Post_t + \epsilon_{it}$$

Panel B of the table summarizes results from estimating this equation:

$$AR_{i,t} = \alpha_i + \gamma_i AR_{i,t-1} + \eta_{i,0} PubCount_{i,t-1} + \eta_{i,1} PubCount_{i,t-1} \times Post_t + \eta_{i,2} Post_t + \epsilon_{it}$$

Bank abnormal returns AR are calculated using equations (A.1) and (A.2). *Pubcount* is a count of banks publications, normalized by assets in \$B. *Post* equals 1 from March 1, 2023. We show the mean η_0 and η_1, and the share of banks with significantly positive or negative estimates of η_0 and η_1. *Index* banks are part of the KBW or KRX indexes. Event banks were downgraded in April 2023. *Index regional banks* are non-downgraded banks in the KRX index. (*Non-index*) banks are publicly-traded banks that are not included in these indexes. Non-index regional banks have assets of at least \$10B. *STBs*=Non-downgraded US stress-tested banks. Standard errors are corrected for heteroskedasticity. $^*p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table IC.3: **Effect of News on Cash and CET1 Factor Betas: Before and during the run**

Panel A: Cash Factor						
	News=Pubcount		News=Pubcount_MA2		News=Pubcount_MA3	
	Estimate	SE	Estimate	SE	Estimate	SE
Factor*Pre	0.12**	0.05	0.14***	0.05	0.13***	0.05
Factor*Post	0.18***	0.04	0.16***	0.04	0.16***	0.05
Pubcount*Pre	0.00	0.01	-0.01	0.01	-0.01	0.02
Pubcount*Post	-0.01	0.03	0.00	0.05	-0.02	0.06
Pubcount*Factor*Pre	-0.02***	0.01	-0.02***	0.01	-0.04**	0.01
Pubcount*Factor*Post	0.08***	0.02	0.12**	0.05	0.12**	0.05
Wald Test: Pubcount*Pre=Pubcount*Post						
P value	0.00		0.00		0.01	
Obs	24134		23852		23570	
Adj R2	0.41		0.42		0.41	
FF5 and Bank MVE?	YES		YES		YES	
Bank FE	YES		YES		YES	
Panel B: CET1 Factor						
	News=Pubcount		News=Pubcount_MA2		News=Pubcount_MA3	
	Estimate	SE	Estimate	SE	Estimate	SE
Factor*Pre	0.01	0.06	0.02	0.06	0.07	0.06
Factor*Post	0.16***	0.04	0.13***	0.04	0.13***	0.04
Pubcount*Pre	0.00	0.01	0.00	0.01	0.00	0.02
Pubcount*Post	0.02	0.03	0.05	0.05	0.02	0.06
Pubcount*Factor*Pre	-0.02**	0.01	-0.04***	0.01	-0.06***	0.02
Pubcount*Factor*Post	0.09***	0.03	0.15***	0.04	0.15***	0.05
Wald Test: News*Factor*Pre=News*Factor*Post						
P value	0.00		0.00		0.00	
Obs	24134		23852		23570	
Adj R2	0.41		0.42		0.41	
FF5 and Bank MVE?	YES		YES		YES	
Bank FE	YES		YES		YES	

Note: This table shows results from estimating the following panel regression from January 3 to May 5, 2023.

$$\begin{aligned} Y_{i,t} = \alpha_i &+ \beta_1 PubCount_{i,t} \times Pre_t + \beta_2 Factor_t \times Pre_t \\ &+ \beta_3 Factor_t \times PubCount_{i,t} \times Pre_t \\ &+ \gamma_1 PubCount_{i,t} \times Post_t + \gamma_2 Factor_t \times Post_t \\ &+ \gamma_3 Factor_t \times PubCount_{i,t} \times Post_t \\ &+ \sum_{j=1}^{5} \delta_j FF_{j,t} + \delta_6 Log(MVE)_{i,t-1} + \delta_7 Post_t + \epsilon_{it} \end{aligned}$$

Y is the bank's excess returns. *Pubcount* is a bank's publication counts divided by assets. *Pubcount-MAx* is the moving average of *Pubcount* over x days. *Pre* (*Post*) equals 1 before (since) March 1, 2023. Estimates for the Fama-French factors FF, bank's market value of equity MVE and *Post* are not shown to maintain brevity. The factors are constructed from long-short portfolios based on 2022Q3 asset shares of uninsured deposits (UID) and unrealized losses on AFS and HTM securities (*Losses*). All variables are standardized to have mean zero and unit standard deviation. Standard errors are robust and clustered by date. Stars represent statistical significance: *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Table IC.4: **Effect of News on the CAPM Beta: Before and during the run**

Panel A: UID Factor						
	News=Pubcount		News=Pubcount_MA2		News=Pubcount_MA3	
	Estimate	SE	Estimate	SE	Estimate	SE
Factor*Pre	0.02	0.05	0.03	0.05	0.03	0.05
Factor*Post	0.13***	0.03	0.11***	0.03	0.10***	0.03
Pubcount*Pre	0.00	0.00	0.00	0.01	0.00	0.01
Pubcount*Post	0.04	0.03	0.07*	0.04	0.06	0.05
Pubcount*Factor*Pre	0.00	0.01	-0.01	0.01	-0.02	0.02
Pubcount*Factor*Post	0.07***	0.02	0.12***	0.04	0.14***	0.04
Mkt-Rf*Pre	0.17***	0.05	0.18***	0.05	0.18***	0.05
(Mkt-Rf)*Post	0.22***	0.05	0.20***	0.05	0.21***	0.05
Pubcount*Mkt-Rf*Pre	-0.02***	0.00	-0.03***	0.01	-0.04***	0.01
Pubcount*(Mkt-Rf)*Post	0.04*	0.03	0.09**	0.04	0.08	0.05
Wald Test: News*Factor*Pre=News*Factor*Post						
P value	0.00		0.00		0.00	
Obs	24134		23852		23570	
Adj R2	0.41		0.42		0.42	
FF5 and Bank MVE?	YES		YES		YES	
Bank Liquidity, KBW and Macro?	YES		YES		YES	
Bank FE	YES		YES		YES	
Panel B: Losses Factor						
	News=Pubcount		News=Pubcount_MA2		News=Pubcount_MA3	
	Estimate	SE	Estimate	SE	Estimate	SE
Factor*Pre	0.03	0.05	0.04	0.05	0.05	0.05
Factor*Post	0.14***	0.03	0.12***	0.03	0.12***	0.04
Pubcount*Pre	0.00	0.00	0.00	0.01	0.00	0.01
Pubcount*Post	0.03	0.03	0.07	0.05	0.04	0.06
Pubcount*Factor*Pre	-0.01**	0.00	-0.02*	0.01	-0.02	0.01
Pubcount*Factor*Post	0.05***	0.02	0.08**	0.04	0.07*	0.04
Mkt-Rf*Pre	0.17***	0.05	0.17***	0.05	0.17***	0.05
(Mkt-Rf)*Post	0.21***	0.06	0.17***	0.06	0.17***	0.06
Pubcount*Mkt-Rf*Pre	-0.02***	0.00	-0.03***	0.01	-0.03***	0.01
Pubcount*(Mkt-Rf)*Post	0.05	0.03	0.13**	0.05	0.13*	0.06
Wald Test: News*Factor*Pre=News*Factor*Post						
P value	0.00		0.01		0.04	
Obs	24134		23852		23570	
Adj R2	0.40		0.41		0.41	
FF5 and Bank MVE?	YES		YES		YES	
Bank Liquidity, KBW and Macro?	YES		YES		YES	
Bank FE	YES		YES		YES	

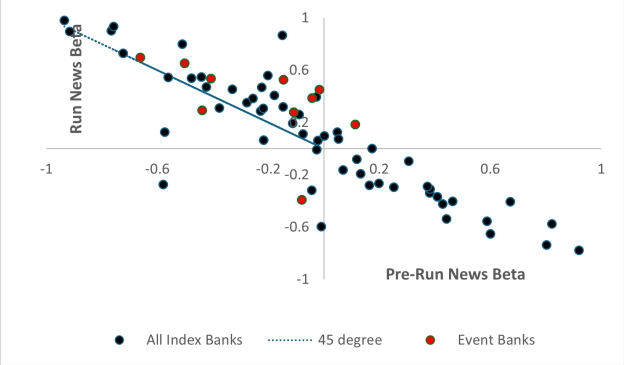
Note: This table shows results from estimating the following panel regression from January 3 to May 5, 2023.

$$
\begin{aligned}
Y_{i,t} = {} & \alpha_i + \beta_1 PubCount_{i,t} \times Pre_t + \beta_2 Factor_t \times Pre_t \\
& + \beta_3 Factor_t \times PubCount_{i,t} \times Pre_t \\
& + \gamma_1 PubCount_{i,t} \times Post_t + \gamma_2 Factor_t \times Post_t \\
& + \gamma_3 Factor_t \times PubCount_{i,t} \times Post_t \\
& + \delta_1 (Mkt - Rf) \times Pre_{j,t} + + \delta_2 (Mkt - Rf) \times Post_{j,t} + \sum_{j=3}^{6} \delta_j FF_{j,t} \\
& + \delta_7 (Mkt - Rf) \times PubCount_{i,t} \times Pre_t + \delta_8 (Mkt - Rf) \times PubCount_{i,t} \times Post_t \\
& + \delta_9 Log(MVE)_{i,t-1} + \delta_{10} Post_t + \epsilon_{it}
\end{aligned}
$$

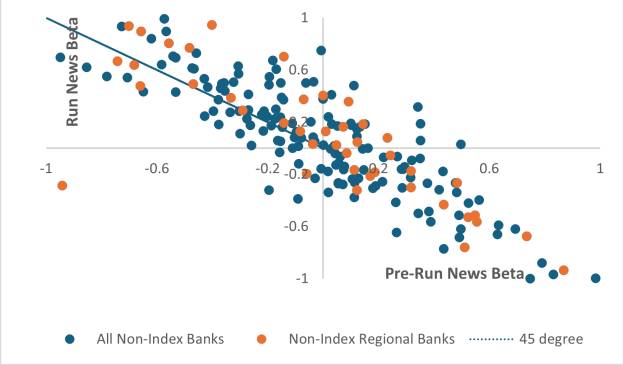
Y is the bank's excess returns. *Pubcount* is a bank's publication counts divided by assets. *Pubcount-MAx* is the moving average of *Pubcount* over x days. *Pre* (*Post*) equals 1 before (since) March 1, 2023. Estimates for the Fama-French factors FF, bank's market value of equity MVE and *Post* are not shown to maintain brevity. The factors are constructed from long-short portfolios based on 2022Q3 asset shares of uninsured deposits (UID) and unrealized losses on AFS and HTM securities (*Losses*). All variables are standardized to have mean zero and unit standard deviation. Standard errors are robust and clustered by date. Stars represent statistical significance: $^*p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Figure IC.1: **Bank Balance Sheet and News Betas Before and During the Run: Cash and CET1 Factors**

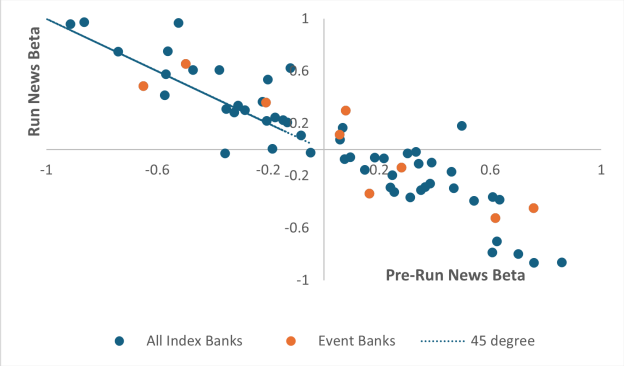
(a) Cash News Beta: Index and Event Banks



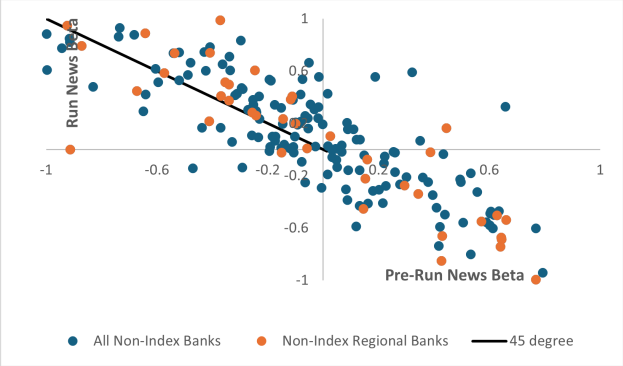
(b) Cash News Beta: Non-Index Banks



(c) CET1 News Beta: Index and Event Banks



(d) CET1 News Beta: Non-Index Banks



Note: These figures show scatter plots of cash and CET1 news β estimates pre-run (horizontal axis) versus during the run (vertical axis) for index (left panel) and non-index (right panel) banks, obtained by estimating specification (A.6) bank by bank from January 1 to May 5, 2023. The news β is the coefficient on the $Factor \times News$ regressor. *Index* banks are part of the KBW or KRX indexes. *Non-index* banks are publicly-traded banks that are not included in these indexes. Colored dots indicate estimates for the *event* banks (i.e., banks downgraded by rating agencies in April) in the right panel and for non-index regional banks in the left panel.

Bank Risk in 2022Q3 and Changes in News Beta During the Bank Run Table IC.5 reports median balance sheet values, as well as average excess returns and *Pubcount*, as of 2022Q3, for banks with significantly positive news betas during the run.

Table IC.5: **2022Q3 Risk of Banks with Significantly Positive News Betas in the Run: *UID* and *Losses* Factors**

Panel A: Factor=UID								
	N	Assets ($B)	Unin. Dep %	Losses %	Cash %	CET1 %	Exp Ret %	Pubcount %
All Index Banks, Sig Positive News Beta	15	23.16**	38.87	3.03	4.40	11.89**	0.09	8.73*
All Other Index Banks	57	47.70	35.79	2.61	4.04	10.75	0.04	7.02
Event Banks, Sig Positive News Beta	2	24.00	38.46	4.09	3.32	11.60	0.10	7.80
All Other Event Banks	10	76.75	44.05	3.20	4.49	9.63	-0.03	6.78
STBs, Sig Positive News Beta	4	202.57	21.95	1.25	15.98	10.27	-0.06	17.05
All Other STBs	17	427.95	35.79	2.43	8.21	10.33	-0.04	6.20
Index Regionals, Sig Positive News Beta	9	19.99	39.27	3.03	4.40	12.74**	0.11**	8.03*
All Other Index Regionals	30	30.88	34.48	2.47	3.07	11.14	0.07	7.51
All Non-Index Banks, Sig Positive News Beta	42	6.08*	30.63	1.98	3.66	11.89	-0.03	26.83
All Other Non-Index Banks	168	4.86	30.63	1.98	3.66	11.89	-0.03	26.83
Non-Index Regionals, Sig Positive News Beta	10	14.68	35.98	1.84	2.19	11.71	-0.06	16.84
All Other Non-Index Regionals	36	16.23	39.53	2.11	2.90	11.31	0.03	11.99
Small Non-Index, Sig Positive News Beta	32	3.92*	29.47	1.98	4.36**	11.89	-0.02	28.44
Other Small Non-Index Banks	132	3.52	31.27	2.23	3.24	12.28	-0.02	32.61
Panel B: Factor=Losses								
	N	Assets ($B)	Unin. Dep %	Losses %	Cash %	CET1 %	Exp Ret %	Pubcount %
All Index Banks, Sig Positive News Beta	15	37.58	38.87	3.03	5.69	11.89	0.08*	8.03
All Other Index Banks	57	46.22	35.79	2.52	3.82	10.63	0.02	7.33
Event Banks, Sig Positive News Beta	3	37.58	57.45	3.34	3.82	11.18	-0.02	8.98
All Other Event Banks	9	69.16	42.99	3.44	3.29	9.65	0.01	6.62
STBs, Sig Positive News Beta	3	214.92	17.09	1.48	8.08	10.62	0.08	23.92
All Other STBs	18	365.76	35.01	2.40	8.60	10.16	-0.06	6.94
Index Regionals, Sig Positive News Beta	9	23.16	38.87	3.03	5.77*	12.36	0.11	7.08
All Other Index Regionals	30	28.74	34.85	2.49	2.79	11.14	0.09	7.93
All Non-Index Banks, Sig Positive News Beta	55	6.42	32.72*	1.88	2.97**	11.42	-0.04	24.65
All Other Non-Index Banks	155	4.33	32.72	1.88	2.97	11.42	-0.04	24.65
Non-Index Regionals, Sig Positive News Beta	12	15.33	35.98	1.90	2.31	10.51*	0.01	14.38
All Other Non-Index Regionals	34	15.89	39.53	2.29	2.90	12.04	0.00	12.57
Small Non-Index, Sig Positive News Beta	43	5.55	32.37	1.86***	3.39	11.72	-0.04	34.14**
Other Small Non-Index Banks	121	3.53	29.17	2.19	3.45	12.30	-0.01	31.41

Note: This table shows the median balance sheet values, and average excess returns and *Pubcount*, in 2022Q3 of banks with significantly positive news betas (i.e., the coefficient on *Pubcount* × *Factor*) associated with the *UID* and *Losses* factors during the bank run. The balance sheet values are reported as % of assets in 2022Q3. *Losses* are differences between par and fair values of AFS and HTM securities. Event banks were downgraded in April 2023. *Index regional banks* are non-downgraded banks in the KRX index. (*Non-index*) banks are publicly-traded banks that are not included in these indexes. Non-index regional (small) banks have assets of at least (less than) $10B. *STBs*=Non-downgraded US stress-tested banks. ***(**)* indicate statistical significance at the 1%(5%)10% level based on a Wilcoxon test with exact computation of p-values. *DG*=Downgraded. *Unin.Dep.* = Uninsured Deposits.

Table IC.6: **2022Q3 Risk of Banks with Significantly Positive News Betas in the Run: Cash and CET1 Factors**

Panel A: Factor=Cash								
	N	Assets ($B)	Unin. Dep %	Losses %	Cash %	CET1 %	Exp Ret %	Pubcount %
All Index Banks, Sig Positive News Beta	18	45.41	38.50	3.56**	6.26*	11.84*	0.01	8.13
All Other Index Banks	54	44.07	35.35	2.44	3.62	10.69	0.05	7.22
Event Banks, Sig Positive News Beta	4	60.96	46.82	3.56	6.31	10.56	-0.03*	9.02
All Other Event Banks	8	55.28	43.56	2.78	2.77	9.51	0.01	6.47
STBs, Sig Positive News Beta	6	885.45	28.72	2.52	11.37	10.48	-0.01	8.13
All Other STBs	15	303.57	35.79	2.37	8.21	9.99	-0.07	6.54
Index Regionals, Sig Positive News Beta	8	20.80	39.07	4.20	4.09	13.26	0.11*	7.56
All Other Index Regionals	31	30.41	34.80	2.42	3.09	11.08	0.09	7.83
All Non-Index Banks, Sig Positive News Beta	41	5.62	32.53	2.04	2.97	11.48	-0.02	35.06
All Other Non-Index Banks	169	5.00	32.53	2.04	2.97	11.48	-0.02	35.06
Non-Index Regionals, Sig Positive News Beta	10	17.12	35.98	1.90	2.19	10.77	0.02	11.41
All Other Non-Index Regionals	36	15.77	38.85	2.29	2.90	11.57	0.00	13.73
Small Non-Index, Sig Positive News Beta	31	3.13	32.37**	2.12	3.89***	11.79	-0.02	38.65
Other Small Non-Index Banks	133	3.89	30.39	2.18	3.42	12.29	-0.02	29.58
Panel B: Factor=CET1								
	N	Assets ($B)	Unin. Dep %	Losses %	Cash %	CET1 %	Exp Ret %	Pubcount %
All Index Banks, Sig Positive News Beta	16	41.00	33.59	2.90	6.17*	11.09	0.04	7.83
All Other Index Banks	56	44.97	37.40	2.57	3.82	10.78	0.05	7.29
Event Banks, Sig Positive News Beta	4	30.36	50.00	4.00*	4.49	10.56	-0.01	7.84
All Other Event Banks	8	78.82	42.98	3.15	3.26	9.51	-0.03	6.05
STBs, Sig Positive News Beta	3	1,877.75	30.63	2.88*	8.83	10.98**	0.00	8.21
All Other STBs	18	220.03	35.01	2.26	8.29	9.95	-0.06	6.94
Index Regionals, Sig Positive News Beta	9	23.16	33.11	2.46	6.09	12.74	0.07	7.63
All Other Index Regionals	30	28.06	36.88	2.57	3.07	11.54	0.10	7.93
All Non-Index Banks, Sig Positive News Beta	37	6.78	32.53**	1.88	3.46	12.41	0.01	22.86
All Other Non-Index Banks	173	4.29	32.53	1.88	3.46	12.41	0.01	22.86
Non-Index Regionals, Sig Positive News Beta	10	15.71	38.51	2.54	2.74	12.63	0.06	16.11
All Other Non-Index Regionals	36	16.02	39.13	2.01	2.77	11.19	-0.01	11.99
Small Non-Index, Sig Positive News Beta	27	5.67	30.31	1.86**	3.86	12.36	-0.02	25.89**
Other Small Non-Index Banks	137	3.51	30.78	2.21	3.39	12.21	-0.02	32.74

Note: This table shows the median balance sheet values, and average excess returns and *Pubcount*, in 2022Q3 of banks with significantly positive news betas (i.e., the coefficient on $Pubcount \times Factor$) associated with the cash and CET1 factors during the bank run. The balance sheet values are reported as % of assets in 2022Q3. Event banks were downgraded in April 2023. *Index regional banks* are non-downgraded banks in the KRX index. (*Non-index*) banks are publicly-traded banks that are not included in these indexes. Non-index regional (small) banks have assets of at least (less than) $10B. *STBs*=Non-downgraded US stress-tested banks. ***(**)* indicate statistical significance at the 1%(5%)10% level based on a Wilcoxon test with exact computation of p-values. *DG*=Downgraded. *Unin.Dep.* = Uninsured Deposits.

ID Internet Appendix ID: Credit Ratings

In this section, we examine whether rating announcements coordinated investor attention to these banks, by assessing whether the factor betas changed before or after rating announcements. We begin by assessing rating announcement effects, and then examine whether ratings coordinated investor actions.

Descriptive statistics of returns Table ID.1 shows the daily means of abnormal returns for different bank groups around crisis and rating events. SVB, SBNY, and Silvergate are included for comparison. Observations for SVB and SBNY stock prices are dropped after they went into receivership on March 10 and March 12, respectively. For the *March DGW* banks, we show results with and without FRC. On March 9 and 10, the first 2 days of the bank run, failed bank abnormal returns plunged between 12% and 56% per day. The event banks had daily mean abnormal returns of between –7% and –8% on these days. The *Non-DG Regional* banks and the *STB*s' abnormal returns fell between 1% and 2% on March 9 but reverted on March 10. On March 13, abnormal returns of the *March DGW* banks fell more than 30% while the *April Only DG* bank stocks fell about 8% and the regionals and STBs fell by about 2%. Following the announcement of downgrade watches after the close of markets on March 13, the event banks exhibit *positive* returns on March 14, indicative of return reversals, and suggesting that the announcement likely did not contain new information to stock market investors. In the 12 days before the first downgrade announcement on April 14 (March 28-April 13), the *April Only DG* banks and regionals declined between 4% and 7% cumulatively while other bank stocks were stable. On the downgrade dates of April 14 and 21, the *March DGW* banks fell about 1%-2% while the *April Only DG* and index regional banks fell by about 1%. However, stock prices increased for all banks on April 19 when Schwab was downgraded. *STB*s had positve returns on all announcement days in April. These patterns are qualitatively robust when FRC is excluded from the *March DGW* banks (see the row labeled "ex-FRC"), with the decline in *March DGW* bank stocks In the 10 days after the last downgrade on April 21 (April 24-May 5) is almost halved.

ID.1 Announcement effects on returns

Table ID.1 shows the daily means of abnormal returns for different bank groups around crisis and rating events. On March 13, abnormal returns of the *March DGW* banks fell more than 30%, returns of the *April Only DG* banks fell about 8% and returns of the regionals and STBs fell by about 2%. Following announcement of the DGW after market close on March 13, the event banks exhibit *positive* returns on March 14, indicative of return reversals. On the downgrade dates of April 14 and 21, the *March DGW* banks fell about 1%-2% while the *April Only DG* and index regional banks fell by about 1%. However, stock prices increased for all banks on April 19 when Schwab was downgraded. *STB*s had positive returns on all announcement days in April. The descriptive statistics suggest no negative effect on returns of the March announcements and some negative effects of the April announcements.

To test the informativeness of ratings more formally, we estimate specification A.8 bank-by-bank and show the results in Table ID.2. Panel A shows effects of the announcement of downgrade watches on March 14. The average abnormal returns are positive for all bank

(column 2), including for the *March DGW* group. Further, the *March DGW* group has an equal share of positive and negative significant returns. COMMENT: STAT SIG BASED ON BANK SE. For all other groups, a higher share of banks have positive instead of negative significant returns. In the next 3 trading days, returns decrease on average for index banks and increase further for non-index banks. These results are consistent with the descriptive statistics shown in Table ID.1. Similar results hold for the April downgrade announcements (Panel B). While average returns are positive for all index banks on announcement day, the *April Only DG* banks have small positive returns. An equal share of the *April Only DG* banks have positive and negative significant returns. For all other groups, a larger share of banks have significantly positive than negative returns. Returns are negative for most groups on average in the next 3 days, including for the *April Only DG* banks. The results indicate that neither the March nor the April announcements were informative.

ID.2 Do Rating Announcements Coordinate Investor Attention?

If the rating announcements act as coordination devices for investors with limited attention, then the betas of event banks should only change after announcements and not before. To identify the announcement effects on the betas, we estimate specification (A.9).

Figure ID.1 shows scatter plots of estimates of the UID and *Losses* factor betas before (x-axis) and after (y-axis) announcements, separately for the March (left panel) and April (right panel) announcements. Estimates for the event banks are shaded orange. For both announcements, the mass of scatters above and below the 45-degree line is similar, indicating little change in the betas around these events. For the event banks, the betas mostly lie below the 45-degree line in March, but above it in April, implying higher betas for event banks after the April announcements but not after the March announcements.

Shares of significantly positive (*sigpos*) betas are shown in Table ID.3. Panel A of the table shows the results for the UID factor. In the pre-March announcement period (columns 3-4), the share of *sigpos* betas exceeds 25% for all groups and is 100% for *March DGW* banks. These shares are lower for all but index regionals after the March announcements. After the April announcements, the shares of *sigpos* betas increase for the *April Only DG* banks relative to the pre-April announcement period for all factors. In particular, for the UID and CET1 factors, the betas increase significantly for more than 70% of downgraded banks.

Figure ID.1 shows scatter plots of estimates (in units) of the UID and *Losses* factor betas before (x-axis) and after (y-axis) announcements, separately for the March (left panel) and April (right panel) announcements. Estimates for the event banks are shaded orange. For both announcements, the mass of scatters above and below the 45-degree line is similar, indicating little change in the betas around these events. For the event banks, the betas mostly lie below the 45-degree line in March, but above it in April, implying higher betas for event banks after the April announcements but not after the March announcements.

We estimate betas around announcements relative to January-February 2023 (the reference period) and plot them in Figure 7. For the UID factor, the mean β increases for all banks in the pre-announcement period of March 1-13, ranging from 0.02 units (for index regionals) to 0.62 units (for *March DGW* banks). After the March announcements, we find no further increases — and sometimes decreases, as inthe case of *March DGW* banks — in the

mean betas. In the post-April announcement period, the betas increase for the *April Only DG* banks relative to the pre-announcement period. Thus, the April (but not the March) announcements are followed by higher betas for downgraded banks. The results are similar for the *Losses* factor (Panel B) and the Cash and CET1 factors (Figure ID.2).

Shares of significantly positive (*sigpos*) betas are shown in Table ID.3. Panel A of the table shows the results for the UID factor. In the pre-March announcement period (columns 3-4), the share of *sigpos* betas exceeds 25% for all groups and is 100% for *March DGW* banks. These shares are lower for all but index regionals after the March announcements. After the April announcements, the shares of *sigpos* betas increase for the *April Only DG* banks relative to the pre-April announcement period for all factors. In particular, for the UID and CET1 factors, the betas increase significantly for more than 70% of downgraded banks.

Discussion There is some evidence that the April announcements coordinated investor attention: for downgraded banks, the average beta and the share of positive betas increases for all factors after announcements. There is no evidence of coordination for the March announcements as the betas increase before, and not after announcements.

Table ID.1: **Daily Means of Abnormal Stock Returns, by Bank Group**

	1/3 – 2/28	3/1 – 3/8	3/9	3/10	3/13	DG Watch 3/14	3/15 – 3/27	3/28 – 4/13	PACW DG 4/14	4/17 – 4/18	SCHW DG 4/19	4/20	Moodys' DGs 4/21	4/24 – 5/5
SVB	0.36	-0.80	-53.79	-57.83	.	.	.	.	.	.	.	.	.	.
SBNY	-0.14	-1.31	-5.89	-18.07	.	.	.	.	.	.	.	.	.	.
Silvergate	-0.51	-12.63	-34.21	-3.07	-5.21	-12.28	0.44	-2.36	-1.97	-1.64	5.42	2.11	-7.16	-0.94
March DG Watch Banks	-0.02	-0.73	-8.62	-7.71	-32.57	9.51	-1.27	-0.07	-2.33	0.66	9.94	-1.18	-0.71	-1.16
March DG Watch Banks Ex-FRC	0.06	-0.56	-5.35	-4.93	-23.23	3.01	0.18	-0.04	-2.22	1.03	9.61	-1.23	-1.26	-0.70
April Only DG Banks	-0.17	-0.42	-7.02	-6.80	-7.51	4.88	-0.51	-0.55	-1.31	1.91	2.48	-1.27	-0.68	-0.47
Non-DG Stress-Tested Banks	0.14	-0.41	-0.89	1.13	-1.51	0.67	-0.37	-0.11	3.08	1.06	0.19	0.76	0.37	-0.13
Non-DG Regional Banks	-0.15	-0.59	-1.98	0.64	-2.61	0.75	0.23	-0.36	-1.46	0.34	2.84	-0.29	-0.59	-0.34
Non-Index Regional Banks	-0.05	-0.60	-2.23	-1.04	-3.66	0.95	0.17	-0.30	-0.42	0.43	1.30	0.12	0.11	-0.46
Non-Index Small Banks	-0.10	-0.35	-2.33	-0.47	-2.50	1.18	-0.06	-0.55	-1.65	-0.33	1.67	-0.15	-0.22	-0.46

Note: The table shows market value-weighted average abnormal bank stock returns (in %) from January 3, 2023 to May 5, 2023 for different bank groups and sample periods. Abnormal returns for each bank and day are calculated according to equations (A.1) and (A.2) in Appendix IC. The table reports the daily market capitalization weighted average of abnormal returns across all banks in a given group. In the *March DGW* group, First Republic Bank (FRC) is dropped on and after May 1, 2023. We also show the *March DGW* group *excluding* FRC throughout the entire sample. *Index regional banks* are non-downgraded banks in the KRX index. (*Non-index*) banks are publicly-traded banks that are not included in these indexes. Non-index regional (small) banks have assets of at least (less than) $10B. *STBs*=Non-downgraded US stress-tested banks. *DG*=Downgraded.

Table ID.2: **Effect of Rating Announcements on Bank Abnormal Returns**

Panel A: March Downgrade Watch							
		Announcement Day Average			3 Days After Announcement		
	N	Avg AR	% AR>0 & p<=0.05	% AR<0 & p<=0.05	Avg AR	% AR>0 & p<=0.05	% AR<0 & p<=0.05
All Banks	282	1.51***	61.35	29.08	0.49***	65.24	24.39
All Index and Event Banks	72	1.72**	51.39	43.06	-0.25	25.71	4.29
March DGW	5	8.58	80.00	20.00	-1.17	12.50	29.17
Index Regional	44	1.40	45.45	50.00	0.06	26.09	4.35
STBs	23	0.82	56.52	34.78	-0.63***	20.45	20.45
All Nonindex Banks	210	1.44***	64.76	24.29	0.74***	22.34	10.64
Non-Index Regional	46	1.70**	63.04	23.91	0.71***	0.00	20.00
Small Non-Index	164	1.37***	65.24	24.39	0.75***	0.00	47.83
Panel B: April Downgrades							
		Announcement Day Average			3 Days After Announcement		
	N	Avg AR	% AR>0 & p<=0.05	% AR<0 & p<=0.05	Avg AR	% AR>0 & p<=0.05	% AR<0 & p<=0.05
All Banks	282	-0.05	42.20	29.43	-0.09	43.59	28.21
All Index and Event Banks	72	-0.23	43.06	29.17	-0.38***	11.35	25.18
April Only DG	7	0.06	28.57	14.29	-0.05	8.10	27.62
Index Regional	46	0.37	45.65	21.74	-3.54	14.29	0.00
STBs	21	-0.23	42.86	33.33	-0.19	0.00	40.00
All Nonindex Banks	210	0.01	41.90	29.52	-0.30***	40.85	31.71
Non-Index Regional	5	0.63	60.00	40.00	0.74	20.83	18.06
Small Non-Index	39	-0.39	43.59	28.21	0.12	4.35	21.74

Note: This table shows the effects of rating announcements on March 14 and April 14, 19 or 21 of 2023 on bank abnormal returns based on estimating equation A.8 bank-by-bank. Bank abnormal returns are calculated according to equations (A.1) and (A.2). The *March DGW* group banks were put on downgrade watch on March 14 and downgraded in April. The *April Only DG* group includes banks downgraded between April 14 and 21. *Index* banks are part of the KBW or KRX indexes. *Non-index* banks are publicly-traded banks that are not included in these indexes. Non-index regional banks have assets of at least $10B. *STBs*=Non-downgraded US stress-tested banks. *index regional banks*=Non-downgraded banks in the KRX index. Stars represent statistical significance: $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$. *DGW*=Downgrade watch. *DG*=Downgrades.

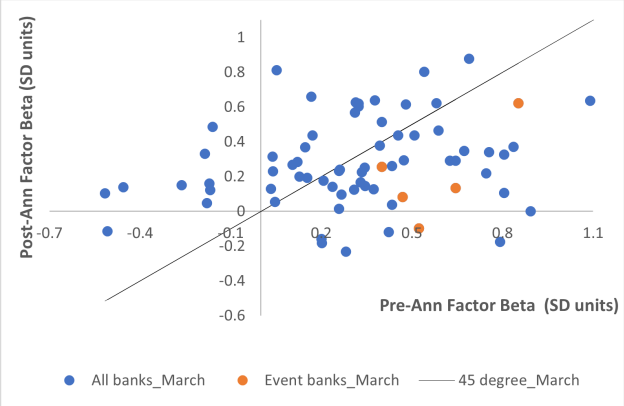
Table ID.3: **Shares of Significant Betas Around Rating Announcements**

Panel A: Factor=UID					
		March Announcement		April Announcements	
		Pre	Post	Pre	Post
	N	% ß>0 & p<=0.05	% ß>0 & p<=0.05	% ß>0 & p<=0.05	% ß>0 & p<=0.05
All Banks	282	42.55	33.33	26.24	37.59
April Only DG	7	71.43	42.86	28.57	71.43
March DGW	5	100.00	20.00	60.00	20.00
STBs	21	76.19	23.81	19.05	33.33
Index Regional Banks	39	25.64	38.46	46.15	41.03
Non-Index Regional Banks	46	32.61	28.26	32.61	39.13
Small Non-Index Banks	164	42.07	34.76	19.51	35.98
Panel B: Factor=Losses					
		March Announcement		April Announcements	
		Pre	Post	Pre	Post
	N	% ß>0 & p<=0.05	% ß>0 & p<=0.05	% ß>0 & p<=0.05	% ß>0 & p<=0.05
All Banks	282	41.84	28.72	6.38	20.92
April Only DG	7	71.43	14.29	0.00	14.29
March DGW	5	80.00	60.00	20.00	20.00
STBs	21	42.86	0.00	4.76	9.52
Index Regional Banks	39	35.90	30.77	0.00	15.38
Non-Index Regional Banks	46	34.78	26.09	2.17	21.74
Small Non-Index Banks	164	42.68	32.32	9.15	23.78
Panel C: Factor=Cash					
		March Announcement		April Announcements	
		Pre	Post	Pre	Post
	N	% ß>0 & p<=0.05	% ß>0 & p<=0.05	% ß>0 & p<=0.05	% ß>0 & p<=0.05
All Banks	282	40.78	23.40	26.60	25.18
April Only DG	7	71.43	14.29	14.29	42.86
March DGW	5	100.00	20.00	60.00	40.00
STBs	21	57.14	14.29	19.05	9.52
Index Regional Banks	39	20.51	23.08	48.72	17.95
Non-Index Regional Banks	46	32.61	23.91	23.91	21.74
Small Non-Index Banks	164	42.68	25.00	22.56	28.66
Panel D: Factor=CET1					
		March Announcement		April Announcements	
		Pre	Post	Pre	Post
	N	% ß>0 & p<=0.05	% ß>0 & p<=0.05	% ß>0 & p<=0.05	% ß>0 & p<=0.05
All Banks	282	43.26	36.52	20.57	30.50
April Only DG	7	71.43	28.57	14.29	71.43
March DGW	5	100.00	20.00	20.00	20.00
STBs	21	38.10	4.76	28.57	14.29
Index Regional Banks	39	28.21	46.15	41.03	33.33
Non-Index Regional Banks	46	30.43	26.09	15.22	30.43
Small Non-Index Banks	164	48.17	42.07	16.46	30.49

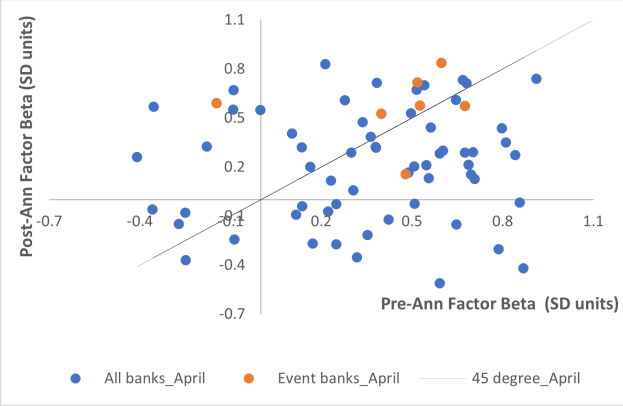
Note: This table summarizes the results of estimating equation (A.9) bank by bank, from January 1 to May 5, 2023. We show the share of banks with a significantly positive β by bank group before and after the March and April rating announcements. The *March DGW* group banks were put on downgrade watch on March 14 and downgraded in April. The *April Only DG* group includes banks downgraded between April 14 and 21. *Index regional banks* are non-downgraded banks in the KRX index. (*Non-index*) banks are publicly-traded banks that are not included in these indexes. Non-index regional (small) banks have assets of at least (less than) $10B. *STBs*=Non-downgraded US stress-tested banks.All variables in the regression are standardized to have mean zero and unit standard deviation. *DGW*=Downgrade watch. *DG*=Downgrades.

Figure ID.1: **Bank Balance Sheet Betas Before and After Rating Announcements: *UID* and *Losses* Factors**

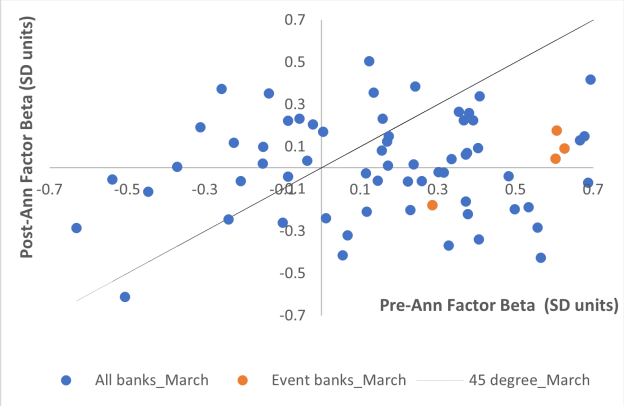
(a) *UID* Beta Around March Announcements



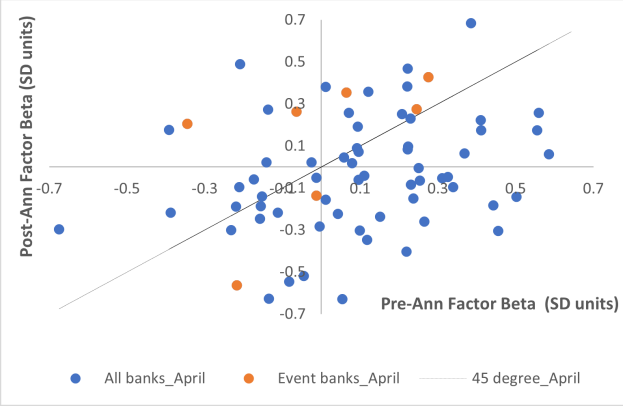
(b) *UID* Beta Around April Announcements



(c) *Losses* Beta Around March Announcements



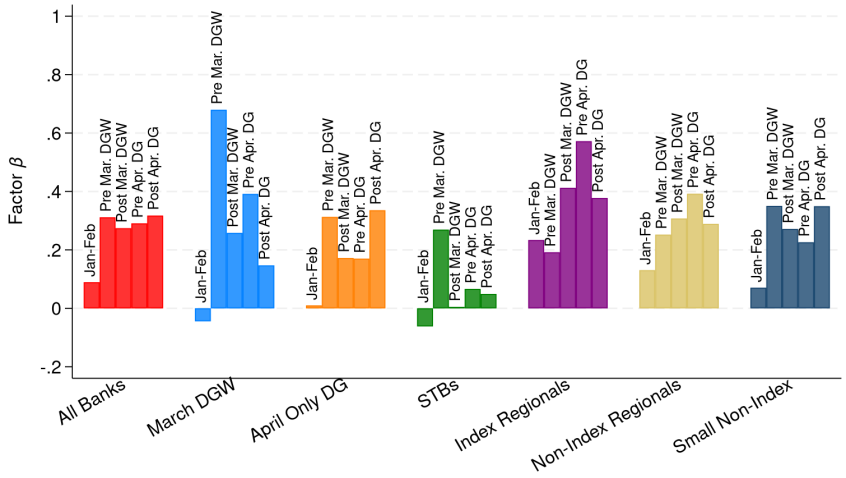
(d) *Losses* Beta Around April Announcements



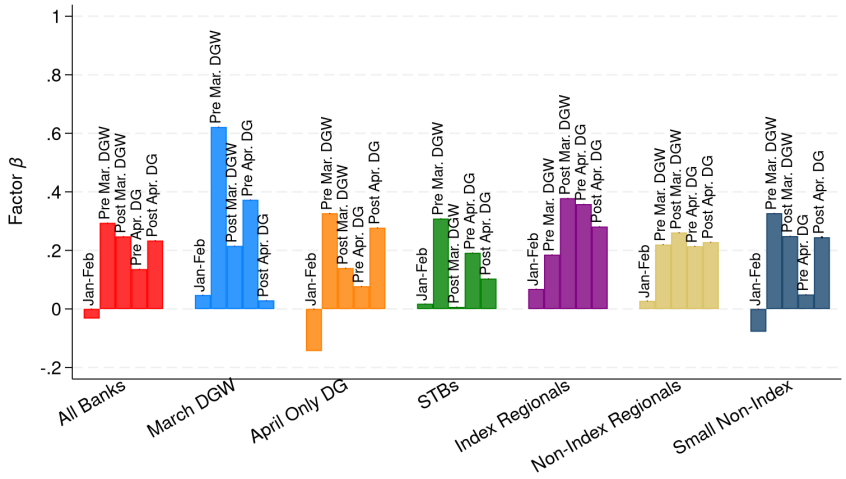
Note: These figures show scatter plots of *UID* and *Losses* factor β estimates before (horizontal axis) and after (vertical axis) rating announcements, for March (left panel) and April (right panel) announcements, obtained by estimating specification (A.9) bank by bank from January 1 to May 5, 2023. Colored dots indicate the estimates for the *event* banks (i.e., banks on downgrade watch in March or downgraded in April by rating agencies). *UID* is the asset share of uninsured deposits. *Losses* is the asset share of unrealized losses on AFS and HTM securities.

Figure ID.2: **Average Betas Around Rating Announcements: Cash and CET1 Factors**

(a) Factor=$Cash$



(b) Factor=$CET1$



Note: These figures summarize the results from estimating this equation:

$$Y_{i,t} = \alpha_i + \beta_{i,0} Factor_t + \sum_{k=1}^{5} \beta_{i,k} Period_{k,t} \times Factor_t + \sum_{k=1}^{5} \zeta_{i,k} Period_{k,t} + \sum_{j=1}^{5} \delta_{i,j} FF_{j,t} + \delta_{i,6} Log(MVE)_{i,t-1} + \epsilon_{it}$$

where Y_i is the excess return of bank i, $Period_{k,t}$ are dummy variables for the 10 trading days before and after the March and April announcements, and sample days omitted from these periods. January-February is the reference period. We plot the average β for each period. The *March DGW* group banks were put on downgrade watch on March 14. The *April Only DG* group includes banks downgraded between April 14 and 21. *Index regional banks* are non-downgraded banks in the KRX index. (*Non-index*) banks are publicly-traded banks excluded from the KRX and KBW indexes. Non-index regional (small) banks have assets of at least (less than) $10B. *STBs*=Non-downgraded US stress-tested banks. All variables in the regression are standardized to have mean zero and unit standard deviation. *DGW*=Downgrade watch. *DG*=Downgrades.

IE Internet Appendix IE: BTFP

Table IE.1: **Shares of OMO Quantities and Losses in 2022Q3**

Panel A: OMO SHARE, 2022Q3							
Bank Group	Number	Mean	Min	P25	P50	P75	Max
All Sample Banks	71	16.99	1.76	10.06	16.37	23.02	53.82
April Only DG	7	23.65	6.73	10.06	23.05	32.14	53.82
March DGW	5	15.10	2.54	5.16	21.72	21.76	24.34
STBs	21	17.01	1.76	13.05	17.03	21.69	30.20
Regional Banks	38	16.01	4.11	8.69	15.06	21.28	38.76
SBNY	1	20.21	20.21	20.21	20.21	20.21	20.21
SI	1	48.50	48.50	48.50	48.50	48.50	48.50
SIVB	1	52.12	52.12	52.12	52.12	52.12	52.12
Panel B: OMO LOSS SHARE, 2022Q3							
Bank Group	Number	Mean	Min	P25	P50	P75	Max
All Sample Banks	71	2.17	0.04	1.10	2.17	2.86	6.81
April Only DG	7	3.04	0.64	1.51	2.86	4.52	6.81
March DGW	5	2.36	0.58	0.66	2.73	3.53	4.33
STBs	21	1.89	0.04	1.21	2.03	2.45	3.93
Regional Banks	38	2.15	0.12	1.10	2.10	2.71	5.47
SBNY	1	2.55	2.55	2.55	2.55	2.55	2.55
SI	1	2.13	2.13	2.13	2.13	2.13	2.13
SIVB	1	7.91	7.91	7.91	7.91	7.91	7.91

Note: The table shows the distribution of the asset share of OMO collateral (Panel A) and losses on this collateral (Panel B) in 2022Q3. SVB, SBNY, Silvergate are not in the sample but shown for reference. The *March DGW* group includes banks put on DG watch in March. The *April Only DG Banks* group includes banks downgraded between April 14 and 28. The *index regional banks* (STB) group consists of non-DG regional (US stress-tested) banks. *DG*=Downgraded.

Table IE.2: **Effect of BTFP Announcement on Bank Abnormal Returns: Using OMO Quantities for Identification**

	Panel A: BTFP Ann Week=March 13-17							
	High OMO Quantity			Low OMO Quantity				
	Avg AR %	%AR>0 & p<=0.05	%AR<0 & p<=0.05	Avg AR %	%AR>0 & p<=0.05	%AR<0 & p<=0.05	High-Low AR% Weekly	High-Low AR% Cum. 2 wks
	Announcement Week							
All Banks	-0.01	25.71	10.00	-0.37	23.57	10.00	0.36	0.10
All Index and Event Banks	-1.04	17.65	23.53	-1.55	23.81	9.52	0.51	0.53
Event Banks	-3.49	0.00	25.00	-9.71	0.00	25.00	6.22	5.06
STBs	-1.80	0.00	44.44	-0.04	0.00	0.00	-1.76	-0.52
Index Regionals	0.28	36.00	8.00	0.46	35.71	7.14	-0.18	-0.31
All Nonindex Banks	0.58	30.34	2.25	-0.16	23.53	10.08	0.74**	0.24
Non-Index Regionals	1.06	42.31	0.00	-0.32	26.32	10.53	1.38*	0.36
Non-Index Small	0.39	25.40	3.17	-0.13	23.00	10.00	0.52	0.14
	Post-Announcement Week							
All Banks	0.20	13.57	6.43	0.37	18.57	7.86	-0.16	
All Index and Event Banks	0.15	17.65	7.84	-0.40	19.05	14.29	0.55	
Event Banks	0.53	12.50	0.00	-3.37	0.00	0.00	3.89	
STBs	0.15	11.11	11.11	-0.57	0.00	33.33	0.72	
Index Regionals	0.03	24.00	8.00	0.49	28.57	14.29	-0.45	
All Nonindex Banks	0.23	11.24	5.62	0.50	18.49	6.72	-0.27	
Non-Index Regionals	0.43	11.54	0.00	1.10	26.32	0.00	-0.67	
Small Non-Index Banks	0.15	11.11	7.94	0.39	17.00	8.00	-0.24	
	Panel B: Placebo Ann Week=Feb 13-17							
	High OMO Quantity			Low OMO Quantity				
	Avg AR %	%AR>0 & p<=0.05	%AR<0 & p<=0.05	Avg AR %	%AR>0 & p<=0.05	%AR<0 & p<=0.05	High-Low AR% Weekly	High-Low AR% Cum. 2 wks
	Announcement Week							
All Banks	-0.18	2.86	14.29	-0.11	8.51	11.35	-0.07	-0.04
All Index and Event Banks	-0.29	4.00	18.00	-0.17	13.64	18.18	-0.12	-0.01
Event Banks	-0.15	11.11	0.00	-0.21	33.33	0.00	0.06	0.29
STBs	-0.32	0.00	14.29	-0.28	14.29	42.86	-0.03	-0.11
Index Regionals	-0.32	3.70	25.93	-0.09	8.33	8.33	-0.23	-0.05
All Nonindex Banks	-0.11	2.22	12.22	-0.09	7.56	10.08	-0.02	-0.07
Non-Index Regionals	-0.18	0.00	10.71	-0.14	0.00	5.56	-0.04	-0.15
Non-Index Small	-0.09	3.23	12.90	-0.09	8.91	10.89	0	-0.02
	Post-Announcement Week							
All Banks	-0.02	13.57	12.86	-0.01	7.80	9.93	-0.02	
All Index and Event Banks	0.18	20.00	10.00	0.09	9.09	0.00	0.09	
Event Banks	0.36	33.33	0.00	-0.16	0.00	0.00	0.52	
STBs	0.03	14.29	7.14	0.22	14.29	0.00	-0.19	
Index Regionals	0.20	18.52	14.81	0.07	8.33	0.00	0.13	
All Nonindex Banks	-0.13	10.00	14.44	-0.02	7.56	11.76	-0.11	
Non-Index Regionals	-0.28	10.71	21.43	-0.02	5.56	11.11	-0.26	
Small Non-Index Banks	-0.07	9.68	11.29	-0.02	7.92	11.88	-0.04	

Note: This table shows summary statistics from estimating the following specification by bank i :

$$AR_{i,t} = \alpha_i + \sum_{k=1}^{3} AR_{i,k} + \eta_{i,0} Day[0,4]_{i,t} + \gamma_{i,0} Day[5,9]_{i,t} + \epsilon_{it}$$

Abnormal returns AR are calculated according to equations (A.1) and (A.2). Day [0,4] is the announcement week and Day [5,9] is the post-announcement week. Results are shown for the BTFP announcement week of March 13-17, 2023, using the sample March 1-31 (Panel A), and a placebo week of February 13-17, using the sample February 1-28 (Panel B). *OMO Quantity* refers to holdings of collateral eligible for open market operations. *Index* banks are part of the KBW or KRX indexes. The *index regional banks* (STB) group consists of non-DG regional (US stress-tested) banks. The *event banks* were down-graded in April. *Non-index* banks are publicly-traded banks that are not included in these indexes. Non-Index *regional* (*small*) banks have more than (less than or equal to) $10B in total assets. Stars represent statistical significance based on Newey-West standard errors: $^*p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table IE.3: **Shares of Significant Changes in Factor Betas Around BTFP Announcement: Identification using OMO Quantities**

Panel A: Factor=UID				
	Share in	Mean ß	% ß<0 & p<=0.05	% ß>0 & p<=0.05
	High	High-Low	High-Low	High-Low
Event Banks	66.67	-0.34***	-12.50	-50.00
Non-Index Regional Banks	56.52	-0.30***	36.15	-8.46
STBs	85.71	-0.23***	44.44	5.56
Index Regional Banks	64.10	0.02	18.57	0.86
Small Non-Index Banks	38.65	0.01	-0.06	4.63
Panel B: Factor=Losses				
	Share in	Mean ß	% ß<0 & p<=0.05	% ß>0 & p<=0.05
	High	High-Low	High-Low	High-Low
Event Banks	66.67	-0.53***	50.00	-25.00
Non-Index Regional Banks	56.52	0.06***	-5.77	0.00
STBs	85.71	-0.52***	66.67	0.00
Index Regional Banks	64.10	-0.28***	40.00	0.00
Small Non-Index Banks	38.65	0.04***	-1.71	-4.24
Panel C: Factor=Cash				
	Share in	Mean ß	% ß<0 & p<=0.05	% ß>0 & p<=0.05
	High	High-Low	High-Low	High-Low
Event Banks	66.67	0.06*	0.00	0.00
Non-Index Regional Banks	56.52	0.28***	-7.31	14.23
STBs	85.71	-0.22***	-16.67	-27.78
Index Regional Banks	64.10	-0.16***	12.86	8.00
Small Non-Index Banks	38.65	0.10***	-2.30	0.94
Panel D: Factor=CET1				
	Share in	Mean ß<0	% ß>0 & p<=0.05	% ß<0 & p<=0.05
	High	High-Low	High-Low	High-Low
Event Banks	66.67	-0.26***	37.50	0.00
Non-Index Regional Banks	56.52	-0.05***	15.38	2.69
STBs	85.71	-0.02	16.67	0.00
Index Regional Banks	64.10	-0.04***	13.71	4.00
Small Non-Index Banks	38.65	0.03***	0.17	-12.48

Note: This table summarizes results from estimating the following regression by bank i from March 1 to March 24, 2023.

$$Y_{i,t} = \alpha_i + \gamma_i Post_t + \beta_{i,1} Factor_t + \beta_{i,2} Factor_t \times Post_t + \sum_{j=1}^{5} \delta_{i,j} FF_{j,t} + \delta_{i,6} Log(MVE)_{i,t-1} + \epsilon_{it}$$

Y is the bank's excess returns. *Post* equals 1 during March 13-24. We show the mean and the share of banks with a significantly positive or negative estimates of $\beta_{i,2}$. *High* (*Low*) indicates banks with above (less than or equal to) median holdings of open market operations (OMO) eligible securities, as a share of assets, in 2022Q4. *Index* banks are part of the KBW or KRX indexes. *Non-index* banks are publicly-traded banks that are not included in these indexes. *Event banks* were downgraded in April, 2023. STBs are non-DG US stress-tested banks. Non-Index *regional* (*small*) banks have more than (less than or equal to) $10B in total assets. All variables in the regression are standardized to have mean zero and unit standard deviation. Stars represent statistical significance based on Newey-West standard errors: $^*p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.