

What the Market Watched: Bloomberg News Stories and Bank Returns as the Financial Crisis Unfolded

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October 2, 2009

Abstract

This paper explores a unique dataset gathered via Bloomberg during the early stages of the recent financial crisis. Unlike previous literature that has often used information on headlines as a metric for news, the dataset here contains information on readership and therefore provides a glimpse into the extent to which financial market participants were focused on the news of a particular firm as the financial crisis unfolded. By examining the news that captured the attention of these participants and exploring its relationship to bank returns, this paper addresses the role that market news and reputation may have had in shaping perception during the crisis. There is strong evidence that firms whose news elicited higher readership suffered significantly lower returns than those that did not, both contemporaneously and subsequently. Those banks that on average had relatively high readership interest, or that ranked highly in readership interest a large proportion of the days in the sample, on average had returns that were about 20 percentage points lower than banks that remained relatively out of the spotlight. In addition, greater news readership is associated with higher volatility of returns. A model portfolio that each day is short the ten banks' stocks that were in the top readership rankings the previous day and long the other stocks generates a cumulative P&L of 1.45% in the run-up to the crisis; during the same time period the S&P 500 Financials Index declined more than 39%. The results suggest that news stories that result in high readership among financial market participants can have a large effect in shaping the latter's perceptions and subsequent decisions. In addition to understanding the impact of firm "news" on equity prices as the crisis unfolded, there also may be significant implications for the release of information, and subsequent "news" reports, regarding borrowing of financial institutions from the Federal Reserve – issues raised in legal cases now before the courts (e.g., *Bloomberg, L.P. v Board of Governors of the Federal Reserve System 2009*, *Fox News Network LLC v Board of Governors of the Federal Reserve System 2009*).

* Kogod School of Business, American University and National Bureau of Economic Research. Kathryn Kerner provided exceptionally diligent research assistance during the data collection effort. This research was initiated independently of, and prior to, the filing of the *Bloomberg v. Board of Governors of the Federal Reserve System (2009)* case. Any references or suggested implications of this research to that case are the author's alone and occurred subsequent to the publication of Judge Preska's opinion and order (*Bloomberg L.P. v. Board of Governors of the Federal Reserve System, 2009*). The views and opinions expressed herein are those of the author and do not necessarily reflect those of anyone affiliated with the Federal Reserve System, where the author was formerly employed.

JEL classifications: G01, G14, G21

“Bear markets salivate at the expectation of news, digest it voraciously, and react more violently than bull markets.” – Parker and Li (2006)

I. Introduction

The recent financial crisis has been referred to as the “the worst bear market since the Great Depression” (Condon and Bhaktavatsalam 2009, Thompson 2009), “the worst bear market of our lifetimes” (Damato and Gullapalli 2009), and “one of the worst bear markets in postwar history” (Bajaj and Story 2008). For much of the past two years it has dominated news headlines, with financial institutions front and center. These institutions suffered dramatic swings in equity prices as both news releases and government announcements fueled panicked speculation on firms’ individual health or fragility and on that of the financial system as a whole. As the crisis unfolded, there was, and continues to be, debate regarding the role of the news media in shaping views of financial market participants. In particular, as the overall outlook declined, it is possible that the impact of news releases was more pronounced, accelerating the decline of some firms that had news announcements related to them. For example, Llewellyn (2009) notes that in the case of Northern Rock, “The run of deposits began immediately after it was announced that the bank had sought liquidity assistance from the Bank of England and that the regulatory authorities had declared that the bank was solvent.”

There is already a large existing literature on the relationship between news and equity markets but the recent financial crisis provides an opportunity to examine this topic in the context of the banking sector. Much of the previous literature has focused on macroeconomic announcements (e.g., Birz and Lott 2008) as a way to distinguish persistence in the market’s reaction to news from correlation or clustering of the news itself, since such announcements typically occur at regular, periodic, pre-announced intervals. A number of studies have considered the impact of corporate news such as earnings announcements (e.g., Brandt et. al, 2008) or CEO interviews (Meshke 2004). The measure of news used in these studies is often related to periodical headlines, such as the width of headlines (Mitchell and Mulherin 1994), the number of headlines (Chan 2003), or the number of articles (e.g., Fang and Peress 2008). In recent years, news aggregators have facilitated access to data on the amount of news available across a variety of news outlets. In an attempt to further identify news information, many authors have considered the type or quality of the news in assessing the impact on financial markets. One approach has been to identify and examine the response to the “surprise” element of news, measured, for example, as the difference between ex ante surveys and ex post realizations (e.g., Birz and Lott 2008). Another has been to classify the news into “good”, “bad” or “neutral” (e.g., Tetlock 2006), sometimes by external survey methods to avoid potential biases that could arise if the classification were done by the researcher also conducting the analysis. Automated methods have also been employed to remove potential researcher bias from the interpretation of text-based information (Lucca and Trebbi 2009).

One difficulty with using headlines is in determining the attention that a headline might garner. General statistics such as a newspaper's overall readership or subscriptions are an imperfect proxy for assessing the impact of a particular story or set of stories and do not necessarily signal the extent to which the news has captured readers' attention. To our knowledge, this is the first paper to incorporate readership information into the news impact analysis. By considering the performance of a subset of bank stocks in conjunction with readership of news stories on the underlying firms in Bloomberg, we get a glimpse of the importance of news media during the run-up to the recent financial crisis. While even readership information does not necessarily capture the level of intensity with which a story is read, it provides a better indication of interest than just headline information alone. In addition, the readership statistics from Bloomberg may be more closely linked to financial market participants' transactions than news associated with other sources due to the close proximity of many Bloomberg terminals to firms' trade execution platforms.

The next section contains a fairly detailed and lengthy description of the unique readership dataset used in this analysis. Section three discusses the construction of returns and provides a wide array of summary statistics. Section four contains the bulk of the analysis of the aggregate panel data set. Section five discusses robustness and sensitivity analysis. Section six concludes.

II. News Readership Data

To understand the unique dataset employed as a proxy for news in this paper, some background description of the decisions surrounding the data collection process is necessary. The core data collection effort involved Bloomberg's NRR function.¹ According to Bloomberg's documentation:

- "...BLOOMBERG NEWS publishes over 6,000 stories on an average day, syndicating to over 450 newspapers worldwide with a combined circulation of 80 million people."
- "Bloomberg delivers news and research across the BLOOMBERG PROFESSIONAL service to hundreds of thousands of investors every day."
- "NRR displays news readership rankings according to what companies/topics BLOOMBERG PROFESSIONAL® service clients are reading the most".

There are two categories of readership provided: "the 10 companies/topics with the highest total readership/publication, and the 10 companies/topics with the highest increase in readership/publication relative to their average amounts of readership/publication, over a specified time range. " Possible ranges are 1 hour, 8 hours, 1 day, 1 week, and 1 month.

¹ Throughout this paper, references related to news, readership, and headlines should be interpreted in the context of this Bloomberg NRR function only and neither can nor should be generalized to other sources of news and information related to the firms considered.

An important feature of the NRR function is the ability to construct customized lists, for example, by forming a list of all the stocks in one's portfolio. The benefit of such a list is that it enables one to observe relative rankings over a subset of firms of particular interest. In the middle of August, 2007, amid deteriorating conditions in the credit markets, I put together a list of 30 large US financial institutions (Table 1) for the purposes of monitoring market news surrounding these firms. While the definitions of "financial institution" varies and has certainly changed in the years since the data collection began, at the start of the collection, the 30 institutions selected represented the subset of the 93 members of the S&P500 Financials Index that met the following criteria: (1) were either bank or financial holding companies, (2) with the majority of their business in banking-related activity, (3) with a US parent company, (4) regulated by at least one of the four primary federal regulators.² Twenty-five of the firms were in the list of Top 50 Bank Holding Companies, published quarterly by the Federal Reserve, as of June 30, 2007. This sample also includes the 23 largest 0% foreign ownership (as defined in the report) firms in the Federal Reserve's Large Banking Corporation report³. The decision to limit the sample to those with a US parent company and 0% foreign ownership was made in recognition of differences in tax, accounting, and supervisory treatment across jurisdictions, as well as to minimize issues associated with equity market timing across different countries. Table 1 also contains information on the size of the firms; at the time the data collection began, this sample together constituted roughly two-thirds of US banking sector assets. It is also notable that 14 of the 19 institutions examined in the recent stress testing exercise (Board of Governors of the Federal Reserve System 2009) are included in the customized list used in this paper.⁴ In hindsight, it is unfortunate that no information was collected on the investment banks (e.g., Bear Stearns, Goldman Sachs, Lehman Brothers, Merrill Lynch, Morgan Stanley), GSEs (e.g., Fannie Mae and Freddie Mac) or insurance companies (e.g., AIG, Hartford Financial, Lincoln National, MetLife) that were also part of the S&P Financials Index but at the time the data collection began these institutions were for the most part not subject to the regulatory capital requirements under which the selected sample of firms operated.⁵

It should be highlighted that because the NRR function each day identifies the "top 10", the news rankings used in this paper represent *relative* rankings across the institutions considered. Therefore, for each day in the sample, there are ten firms "in the news"; the remainder are classified as "not in the news".

² The qualification "with the majority of their business in banking-related activity" excluded MetLife from the list, despite its bank holding company status at the time this exercise began. The four US primary regulators are the Federal Reserve, the Office of the Comptroller of the Currency, the Federal Deposit Insurance Corporation, and the Office of Thrift Supervision.

³ One institution, Zions Bancorporation, is not as large in terms of size as some of the institutions not included in the sample, but was included in the data collection due to its presence in the S&P500 Financials Index. In addition, the qualification "0% foreign ownership" excluded M&T Bank Corp from the list. The Large Commercial Banks report used for selection is available online, at <http://www.federalreserve.gov/releases/lbr/20070630/default.htm>

⁴ Of the five that are not included, four (e.g., American Express, GMAC, Goldman, Sachs and Morgan Stanley) became bank holding companies subsequent to the end of the news sample. The one remaining institution, MetLife, was excluded for reasons mentioned in footnote 2 above.

⁵ This implication is an important distinction of these institutions, although not the focus of this paper -- that at the time the data collection began, they were not subject to the same capital regulations as the firms in the sample.

By construction, firms in the news had greater readership than those not in the news. This design enables a wide variety of cross-sectional, time series, and full panel data analyses.

An important limitation of the NRR function is that it does not maintain a historical record; it was therefore necessary to collect the readership data each day. The collected news data contain rankings on most trading days over the period from August 16, 2007 – August 26, 2008 (the market was closed on 11 of the total of 269 weekday observations).⁶ While every attempt was made to collect the data consistently each day at 5pm, time constraints on some days forced the data collection to occur somewhat earlier or later than 5pm; in addition, there are fourteen missing days where no data collection occurred. Hence excluding holidays and missing observations, there are 244 sample days. This paper uses the 8-hour readership rankings as that time horizon (i.e., corresponding roughly to the hours the US stock market is open) seemed most appropriate for the sample of US domestic institutions in the customized list.

The data provide a unique opportunity to consider the events surrounding the recent financial crisis. In particular, the sample represents the “approach to the precipice”, that is, slightly over a year’s worth of data leading up to September/October 2008 when policymakers and market participants alike saw the global financial system on the brink of collapse. While there are varying opinions as to the exact date the crisis began, Swagel (2009) highlights August 2007 as the beginning of the credit market disruption that “developed into a full-blown crisis in the fall of 2008”, corresponding almost exactly to the sample period in this paper.⁷ As it turns out, the first point in the sample, August 16, 2007 was the date that Countrywide Financial was downgraded and forced to draw its entire \$11.5bn credit line generating speculation about its future; the following day, August 17, 2007, the Federal Open Market Committee in an unscheduled meeting cut the discount rate by 50 basis points, its first inter-meeting rate decision since immediately after the attacks of September 11, 2001. For the most part, the sample period also avoids many, but not all, of the policy interventions that attempted to stabilize the markets, in particular the partial government-ownership of many of the institutions in the sample. Some of the important events that occurred during the sample period include the seizure of Northern Rock and the start of the Fed’s easing cycle (September 2007), two more inter-meeting rate cut decisions by the FOMC (January and March 2008), the collapse of Bear Stearns (March 2008), and the failure of IndyMac (July 2008).

⁶ The sample period used represents the full time period over which the data were collected. It is not possible to construct subsequent data retrospectively due to the limitation mentioned.

⁷ Taylor (2009) also cites August 2007 as the beginning of the crisis; a number of other authors highlight the summer of 2007 (e.g., Allen and Carletti 2008, Brunnermeier 2009) .

The NRR Rankings

The daily NRR rankings were initially coded from 1 to 10 (10 being highest readership for that day). On days where an institution did not make the NRR list, it receives a code of '0', indicating the data for that firm on that day are censored, that is, we do not know whether there was news about the firm on that day, only that it did not make the top readership list. In other words, there was relatively more news about at least ten other firms on the list on that day. Histograms showing the distribution of news rankings for each bank are shown in Figure 1; in addition, Figure 2 shows the complete time series of the news indicator for each bank. Figure 3 shows the distribution of banks in each particular ranking. Summary statistics for each bank are given in Table 2. Broadly speaking, the banks can be grouped into three categories:

- Group 1 consists of the largest banks in the sample, the ones that are in the news a large fraction of the time and have sufficient variation in the rankings when they are ranked to allow for analysis that considers the effects of not just being ranked but of the magnitude of the rankings (i.e., the relative ranking versus other firms that are in the headlines).⁸ Bank-level regressions for this group may include a full set of dummy variables, one for each ranking. These banks are Bank of America, Bank of NY, Capital One, Citigroup, Countrywide, Fifth Third, First Horizon, JPMC, National City, State Street, SunTrust, Wachovia, Washington Mutual, Wells Fargo.
- Group 2 consists of banks that appeared in the rankings fairly often (more than 20 times) but not often enough to warrant analysis of the magnitude of the ranking (i.e., no more than 10 observations at any single ranking level). Bank-level regressions for this group would include a news/no-news dummy variable. These banks are Commerce, Compass, Discover, KeyCorp, Regions, Sovereign
- The remainder of the banks do not contain enough variability to warrant individual analysis but can be incorporated into panel-level analysis. These banks are BBT, Comerica, Hudson City, Huntington, Loews, Marshall & Ilsley, Northern Trust, PNC, US Bancorp, Zions.

Taken together, the table and figures reveal a number of interesting observations:

- 1) Seven of the eight largest institutions by size dominated Bloomberg news readers' attention, appearing in the NRR rankings more than 80% of the time. The one exception was US Bancorp, only appearing in the rankings on 7.4% of the days.

⁸ The intuition behind thinking about relative rankings is that despite being in the headlines, a firm that is lower ranked receives less attention than a firm that is higher ranked.

- 2) Although Bank of America was in the NRR rankings every day (100% of the time) and JP Morgan Chase 99.2% of the days (all but two), Citigroup had the highest average ranking, averaging 8.79 overall (including the 5.7% of the days that it was unranked) and 9.32 in the days that it appeared in the NRR list.
- 3) Eleven institutions largely stayed out of the NRR limelight, spending less than 10% of the days in the top ten list, and with average rank less than five in the days they appeared in the rankings.
- 4) Twelve institutions had the highest readership at least once during the sample period. Citigroup captured more than 48% of the '10' rankings, followed by Countrywide (16.7%), JP Morgan Chase (11.4%), Wachovia (7.3%), and Bank of America (6.5%). Two institutions (BB&T and PNC) never had a ranking above 4, and only had 6 days in the rankings overall.
- 5) The time series patterns (Figure 2) highlight the variation in headline news appearances across the thirty institutions. This set of graphs shows that in addition to the seven large institutions mentioned above, Capital One and National City also spent a significant portion of the sample in the headlines. Twelve other institutions exhibit enough variation and clustering over the sample to warrant inclusion in the individual firm-specific analysis that allows for variation across ranking categories (i.e., separate dummy variables for different ranking levels).

As a final descriptive statistic on the news proxy, a runs-test for randomness was performed on a news/no-news dummy for each institution. In all cases except one (Comerica) the null hypothesis of randomness was rejected at well beyond the 99% significance level.⁹

III. Returns in the context of high news readership

For each of the banks in the sample, returns are constructed from NY close mid (average between bid and ask) prices obtained from Bloomberg.¹⁰ In addition, returns are constructed from closing prices on the S&P500 Financials Index in order to control for sector and more general equity market effects. Much of

⁹ Results are omitted here in the interest of space but of course are available upon request. The null hypothesis for Comerica is rejected at the 95% level of significance.

¹⁰ I also considered close-open returns (corresponding almost exactly to the return over the 8-hour window of the news readership rankings) and open-to-previous-close returns (in order to try to isolate more accurately an immediate effect of the appearance in the news readership list). Close-to-close returns were used due to the availability of mid prices, in order to minimize effects due to bid-ask bounce. While a comparison of the last available price of bid and ask prices often enables identification in order to adjust the last price for bid-ask bounce, this is not always the case. In addition, for the banks considered in this paper, although during normal times the bid-ask spread is typically small (i.e., one to three cents), on occasion it was substantially larger during the crisis. Finally, the open can differ dramatically from the previous day's close, for example due to overnight news and broad-based trading from overseas markets. Because this paper looks specifically at US banks, it did not seem appropriate to use equity performance in the overnight market as the measure of returns.

the analysis will use excess returns relative to the index; where the time horizon being considered extends beyond one day, both arithmetic and geometric excess returns are computed. The returns data cover the period August 16, 2007 – August 26, 2008. For comparison purposes in some parts of this paper, returns over the period August 27, 2008 - July 30, 2009 are also used. The choice of endpoint for this comparison period represents the day that work on this paper began and is admittedly arbitrary. However, as time has progressed, rather than selecting another arbitrary date and risk the choice being influenced by news or other events that have occurred since the analysis began, the original endpoint has been retained. It is used primarily for reference as a minor post-logue; most of the analysis in this paper focuses on the period for which news information is available, i.e., August 16, 2007-August 26, 2008.

To begin investigation of the relationship between news readership and returns, Table 3 contains the cross-sectional correlations between a number of returns measures and rank measures. Contemporaneous returns for each firm are computed as the percentage return in the firm's equity price over the period August 16, 2007-August 26, 2008. Arithmetic excess returns are computed as the difference between a firm's cumulative daily return over the full sample period and the corresponding cumulative daily return of the S&P500 Financials Index. Geometric excess returns are computed by cumulating the daily excess returns, DER_t , computed as:

$$DER_t = \frac{(1 + r_{ft})}{(1 + r_{mt})}$$

where r_{ft} is the daily percentage change in the firm's equity price and r_{mt} is the daily percentage change in the S&P500 Financials Index.¹¹ Subsequent returns refer to the percentage change in the firm's equity price over the period August 27, 2008 – July 30, 2009 (the post-data collection period). Three rank measures are used for comparison: (1) the average rank when the firm appears in the NRR list, (2) the average rank over all days in the sample (including zeros for days the firm does not appear in the NRR list), (3) the fraction of days that the firm appears in the NRR list.

There is a clear negative correlation between being in a highly-read news story and returns during the period studied. Banks with higher average rank and a greater fraction of days being ranked have lower returns, both contemporaneously and in the subsequent period. Those banks also had lower excess returns; in every case the correlations between the two excess returns measures and the rank measures are more negative than the correlation using contemporaneous raw returns. In contrast, there is little evidence of

¹¹ Returns are computed using trading days and are not adjusted for weekend effects or transactions costs. A good discussion of the distinction between arithmetic and geometric excess returns is Ryan (2009).

autocorrelation in either returns (the average correlation across banks is -0.03) or excess returns (the average correlation across banks is -0.01).¹²

Table 4 corroborates the correlation results. The banks were divided according to ranking in two ways: (1) those with average daily ranking above one versus below one, (2) those that appeared in the NRR headlines on more than 10% of the days in the sample and those that appeared less than 10% of the days. The results are striking; those with average ranking above one suffered an average 53% decline in their equity price, compared to an average 34% decline among banks with average ranking less than one. In the year following the data collection, those same institutions continued to suffer larger declines in equity price, falling an additional 54.4% on average (compared to 38% decline among the other firms).¹³ The results using excess returns are qualitatively similar. In addition, dividing the sample by fraction of days ranked yields similar results. Collectively, these two tables indicate that those firms that spent more of the sample period in the headlines experienced lower returns, both during the sample and in the year following, than the other firms in the sample. In contrast, those firms that were in the headlines less frequently outperformed both the other firms and the S&P500 Financials Index more broadly. For example, those firms that appeared in the NRR lists less than 10% of the days had geometric excess returns of more than 24%, as compared to -16% for those firms that were in the NRR lists more than 10% of the days.

On aggregate there is evidence that for most banks, staying out of the news rankings in the early part of the financial crisis was associated with higher return. Figure 3 shows for each bank the difference in average daily returns on news days versus non-news days.¹⁴ The top panel is the difference using the returns on the same day as the news indicator is measured; the bottom panel shows the difference when returns are measured on the day following the news.¹⁵ It is evident from both panels that more firms (17) experienced lower returns on news days than on non-news days. Nine firms had more than 100bps lower average return on days that they were in the top readership list as compared to the days when they were not. In contrast, only two firms, Capital One and Huntington Bancorp had a more than 100bps higher average

¹² The maximum autocorrelation is 0.25 (Bank of America) and the minimum is -0.26 (Bank of New York), possibly indicating that the low average autocorrelations are a result of positive and negative autocorrelations cancelling each other. The average autocorrelation of *absolute* returns across firms, however, is only 0.08.

¹³ These results are consistent with Chan (2003), who documents momentum effects of stocks in the news, noting that "...stocks with bad public news display a negative drift for up to 12 months. He also notes that the effect for stocks with good news is diminished; the data used in the present study cannot distinguish between "good" and "bad" news.

¹⁴ There is no bar for Bank of America since it appeared in the rankings on every day in the sample. In addition, the large JPMC spike is due to only one non-news observation during the sample; therefore, both the sign and magnitude of the difference for this bank is purely anecdotal and should not be generalized. The results using excess returns are qualitatively similar.

¹⁵ The exact timing of the news story is not known so considering also the subsequent day allows for the possibility that the story broke late in the day. Since the news indicator measures readership, however, it is likely that firms that made the top ten readership list for that day had news stories that broke early in the day. Note also that the computation of next day returns does not at this stage control for whether or not the subsequent day was also a news day. To the extent news is correlated, the results on the subsequent day may not differ substantially from the contemporaneous returns.

return on news days than non-news days. Even more striking is that being the focus of Bloomberg readers' interest appears related to subsequent returns; the day after being in the most-read-news list is associated with a lower return for 18 firms. It is important to acknowledge that there are numerous explanations for this pattern, for example, if the news stories are correlated or if news rankings appear in strings; we will investigate these explanations further later in the paper. In addition, due to data limitations, the results cannot distinguish between Bloomberg versus other forms of media as the source of any news impact, and it is possible that appearance in the news, and associated news readership, is appropriately related to when market-moving information becomes available more broadly.

It is also apparent that on days when firms have stories printed about them that result in high readership, there is greater returns volatility. Figure 4 shows the ratio of the standard deviation of daily returns on news days to the standard deviation of daily returns on non-news days; as with the previous figure, the top panel uses contemporaneous returns (i.e., on the same day as the ranking indicator is measured) and the bottom panel uses the returns on the day following. A value of one (indicated by the horizontal line in the figure) indicates no difference in volatility of returns between news and non-news days. Returns volatility is lower on non-news days for only three banks: Comerica, Northern Trust, and Suntrust. Referring back to figure 2, and Table 2, Comerica and Northern Trust rarely appeared in the NRR rankings (only Huntington had a fewer number of newdays); hence for these two firms, the standard deviation is computed based on a very small sample. The results are qualitatively similar when subsequent days' returns are considered; returns volatility is for the most part higher on days following being in the news. It is somewhat notable that for Citi, JPMC, and Wachovia, returns volatility is actually lower following news days than on non-news days but this result is again based on a small number of non-news observations. In addition to Bank of America (which was in the news 100% of the days in the sample), these are the largest firms and were in the rankings more than 90% of the days. Despite the limited size of the non-news sample for these four largest firms, a plausible explanation for the higher returns volatility following non-news days for these firms is that because they are frequently featured in headlines by virtue of their importance to the financial sector, in their case the absence of news created uncertainty in the same way that for other firms a news appearance might.

The above descriptive results serve as a starting point for the analysis. By documenting a number of interesting patterns, we can identify areas for further inquiry. There does seem to be evidence that being in the headlines is associated with lower returns but of course this association is not necessarily causal. In addition, the relationship is likely bidirectional; being in the headlines may affect returns but similarly, experiencing lower returns may land a firm in the headlines. Also as noted above, it is important to consider weekend effects, missing observations, and differences across banks. The next section begins the more formal analysis by considering the patterns between the news indicator and returns for the entire data sample.

IV. Panel results

The aggregated data news readership data form an unbalanced panel since three firms (Commerce Bancorp, Compass, and Countrywide) were acquired prior to the end of the sample period. The top panel of Table 5 gives summary statistics for daily excess returns for the whole panel, comparing news and non-news returns. As can be seen from the full-sample column, on average excess returns over the whole sample of institutions was -0.02% per trading day during the sample period. Due to the rapid decline in bank stock prices in the early part of the financial crisis, the magnitude of daily excess returns is sometimes quite large, ranging from a more than 41% decline to a nearly 50% increase in a single day.¹⁶

The next two columns in Table 5 split the sample returns according to whether firms are in the customized Bloomberg news rankings on the same day or not. The final two columns similarly split the returns on the day after the news rankings to consider whether there is an effect on the firms' returns following high readership interest. Since there are 30 firms and by construction each day ten of them appear in the customized NRR list, approximately 1/3 of the returns are in the ranked news sample and the other 2/3 are in the not-ranked sample. On average, returns are statistically significantly lower when firms have high readership news stories compared to firms that do not, both contemporaneously, and in the day following a ranking appearance. Firms in the ten highest readership rankings averaged -0.18% daily excess returns on the day the news appeared and a further -0.16% the following day; in contrast firms that may have been in the news but had relatively less attention gained 0.06% when they were not in the rankings and a further 0.04% on the following days. In addition, excess return volatility is statistically significantly higher when firms are in the top ten in terms of readers' attention; the average standard deviation of excess returns is approximately twice as large for these firms compared to those that were not in the rankings. The increased volatility continues into the following day; the average standard deviation of excess returns for firms that were in the news readership rankings the previous day is nearly 50% higher than the average standard deviation of excess returns for firms that were not. Excess returns exhibit more positive skewness when firms are not in the readership rankings and fatter tails when they are.

We next turn to basic panel regressions to explore the relationship of high Bloomberg readership ranking to both risk and return. An initial feasible GLS regression (not shown) of excess returns on day-of-the-week dummy variables, including fixed effects and allowing for cross-sectional heteroskedasticity yields no statistically significant differences across days. In addition, there is no day-of-week variation in

¹⁶ The 41% decline marked the worst decline in 24 years for National City on 3/17/2008; on that day there was a Bloomberg story that buyout prospects for the firm had faded, scoring a readership ranking of 8. This date also coincided with the day that the JPMC acquisition of Bear Stearns was announced (JPMC had a readership ranking of 10). The nearly 50% increase corresponds to Countrywide on 1/10/08, when it was announced that Bank of America was in talks to buy Countrywide – Countrywide's readership ranking was 10 on that day.

the readership measures since each day exactly ten of the firms in the sample were ranked. As a result, day-of-week dummies are omitted from subsequent regressions. Table 6 considers the risk premia earned by bank stocks when their firms are not the subject of the highest readership scrutiny, estimated using panel feasible GLS which allows for the presence of cross-sectional heteroskedasticity and contemporaneous correlation. Excess returns are expressed in percent, i.e., multiplied by 100. In addition, firm fixed effects are included in all regressions and heteroskedasticity-consistent standard errors (White 1980) are provided.¹⁷

Panel A of Table 6 considers three different news measures: (1) a dummy equal to one on days when a firm appears in the customized top-10 readership list, (2) actual ranking within the list, from 10 (highest readership that day) to 1 (10th highest readership), and (3) a dummy equal to one on days when a firm is among the three highest in that day's rankings. Note that specification (2) implies that readership rankings are linear, in other words, having a rank of 2 has twice the effect on daily excess returns as a rank of 1. Of course this is not really the case, since the rankings are purely ordinal and we do not know the magnitude of readership intensity associated with each rank. In addition, there is nothing to guarantee that the readership intensity associated with any particular rank is the same from one day to the next. Nonetheless, allowing for variation in the news variable beyond a binary dummy variable enables a firm like Bank of America, that was in the rankings every day of the sample, to be included in the analysis.

The column "contemporaneous news" shows that on the same day that stories that result in high Bloomberg readership about a firm appear, the firm's stock experiences significantly negative daily excess returns. Being among the most-read is associated with a -0.26% decline in excess of the S&P500 Financials Index, relative to firms that did not garner as much attention. The higher the ranking, the more negative the daily excess return.

The column "prior day news" considers whether subsequent returns are affected by appearance in the readership rankings by regressing daily excess returns on a one-day lag of the news measure. If shocks related to high news visibility persist then we would expect continued declines in daily excess returns the day after being among the readership rankings. There is no evidence this is the case. In contrast to the results from individual firms, in the panel there appears to be no indication that excess daily returns of firms that appear in the rankings are statistically significantly different from firms that do not appear in the rankings on the day after the rankings occur. One caveat to this conclusion, however, is that because each day ten firms are in the news, the strong contemporaneous effect may counterbalance the effect of being

¹⁷ The results presented are qualitatively robust to the use of feasible GLS, firm fixed effects, White heteroskedasticity-consistent standard errors, and inclusion of weekday dummies, as well as the use of raw returns instead of excess returns. Time fixed effects can be incorporated by using least squares estimation that equally weights each firm rather than the feasible GLS weighting; doing so strengthens the results related to the contemporaneous effect and some levels of significance. These results are omitted here in favor of presenting those allowing greater flexibility regarding variation across firms but are available on request.

ranked the previous day (that is, some of the firms classified as “not in the news” in the prior period may be in the news in the current period). In addition, it is possible that the daily frequency considered here is too low to detect subsequent incorporation of information, given the likely rapid reaction of market participants to news during this time, so that any news response would be reflected in the contemporaneous return only.

Of course the contemporaneous association could be due to reverse-causality, that a large decline in stock prices is likely to result in news stories covering the decline and also to generate greater interest from readers of financial press stories. In other contexts, authors have considered a “calm before the storm” effect, that financial markets are quiet in the days prior to a news announcement (e.g., Jones, Lamont, and Lumsdaine 1998). The “calm before the storm” concept is less relevant here, since in the full panel every day is in part a news day, and unlike in studies of macroannouncement effects, appearance in the Bloomberg top-ten is not a periodic event. Large stock price moves on the day before a high readership ranking also could be an indication of an anticipatory effect. Therefore, Table 6 also reports results from including a lead of the news measure in the regression. Daily excess returns are statistically significantly lower on days preceding appearance in the top-ten in terms of readership. For example, firms that appear in the top three experienced on average a decline of 0.338% in their stock price the preceding day. This may be a reflection of increased likelihood of a news story reporting such declines, making it more likely that a firm will appear high in the readership rankings the following day. As noted above, in many cases appearance in the readership rankings appears to occur in strings, giving rise to autocorrelation of the news measures. With the current dataset, there is no way to separately identify an increased number of stories about a firm from an increased intensity of reader interest for a given story. When the contemporaneous, lead, and lag of the news measure are included together in the regression, only the lead is significant (Panel B).

The third panel in Table 6 considers each rank separately. These results provide strong evidence that receiving relatively greater attention as measured by Bloomberg readership statistics is on average associated with statistically significantly negative excess returns. The coefficients on all rank dummies are negative. The firm with the highest readership interest on average declined more than -0.8% further as compared to firms that were not ranked on the same day. These results are somewhat sensitive to choice of specification, however; without the inclusion of firm fixed effects, for example, few of the rank dummies have coefficients that are significantly different from zero.

Figure 6 compares the distributions of returns in the highest and lowest readership rankings. The top graph compares the histogram of daily excess returns of stocks when corresponding firms had the highest readership score versus the lowest (while still being in the readership rankings, i.e., the 10th highest). It is evident that excess returns are lower, with fatter tails, among the firms in the highest

readership category. A Q-Q plot (bottom graph) comparing the distribution of daily excess returns among news-ranked firm-days to that of daily excess returns among the non-ranked corroborates this inference.

Another way to assess differences across relative rankings is to form rank-specific portfolios and consider their cumulative excess returns over the 8/16/2007-8/26/2008 sample period. Each day, the portfolio is long the stock whose firm corresponds to that portfolio's readership ranking, recalling that each day only one of the 30 firms in the sample has that ranking. The cumulative returns for each of the ten portfolios are shown in the top graph in Figure 7, with 10 corresponding to highest readership. It is evident that higher relative readership is associated with larger negative returns; the portfolio consisting of the highest visibility firm each day would have cumulatively lost more than 87% over the sample period. Such a portfolio is not entirely realistic, however, since the ranking is only known at the end of the day. The bottom graph therefore shows cumulative excess returns from portfolios constructed by going long the stock at the close (after the ranking is revealed) and holding until the end of the next day (when a new position is taken or, if the firm retains its rankings, the current position is rolled for another day).¹⁸ Even using a subsequent-day trading strategy, portfolios associated with high relative readership suffered significantly lower returns.

Over the full sample, a two-sided test for the equivalence of means (returns averaged across all dates and firms on news days versus returns averaged across all dates and firms on non-news days) is rejected with p-value 0.07 for contemporaneous returns and 0.11 for next-day returns. As an additional metric, I computed P&L from a simple strategy of going long each stock whose firm had stayed out of the news the previous day and short each stock whose firm had been in the news the previous day, investing equal units of \$1 in the long and short positions.¹⁹ On days following those days where the news ranking is not observed, no positions are taken. In the absence of funding and transactions costs, the cumulative P&L over the period August 16, 2007-August 28, 2008 (the time period over which the news data are available) is 1.85%. Even without Bank of America (which over the full sample experienced a 42.1% decline and for this exercise has a short exposure throughout as a result of being in the NRR ranking every day of the sample), the cumulative P&L is still 1.45%. Put in the context of a more than 39% *decline* in the S&P 500 Financials Index over the same period, the return on this simple trading strategy is considerable.

Finally, over the full sample, the proportion of firm-days with positive excess returns was 49.6%, insignificantly different from a coin-flip. In contrast, the proportion of firm-days with positive excess

¹⁸ Portfolio returns do not reflect funding or other transactions costs.

¹⁹ Investing equal units in the long and short positions accounts for the fact that each day I am long more firms than I am short since only ten firms appear in the news rankings that trigger the short positions. Within each position (long or short), I invest equal amounts in each firm's stock. As a result, the weight on each stock in the long portion of the portfolio is slightly less than the weight on each stock in the short portion of the portfolio.

returns when the firm was in the customized readership list was 44.4%, statistically significantly different from a coin-flip. The difference from a coin toss is even greater for the highest rankings, with less than 40% of the firm-days witnessing positive excess returns if a firm had one of the three highest readership rankings. This result holds when one considers excess returns the day after a firm appears in the three highest readership rankings as well.

V. Sensitivity Analyses

Reverse causality

As noted above, the observation of high readership among BLOOMBERG PROFESSIONAL® service clients and contemporaneous negative returns does not necessarily indicate a causal relationship. To some extent, using returns on the day following high news visibility enforces a causal chronology that addresses this concern, particularly as the results are consistent with the contemporaneous results. Nonetheless, it is not possible to know with certainty that the appearance in the readership rankings is not a result of a firm having experienced a substantial decline in returns, particularly if that decline occurred over a number of days as may have occurred in the run-up to the financial crisis. With two continuous variables, tests of Granger causality may be employed, but such an approach is not straightforward when using an unbalanced panel dataset and one of the variables is ordinal.

To investigate possible reverse-causality, where a large change in the equity price may lead to a news story, probit regressions were conducted for each firm with the dichotomous news dummy as the dependent variable and either the contemporaneous daily return (or excess return) or the previous day's daily return (or excess return) as the independent variable for all banks except Citi and JPMC where there were not enough non-news days, and Hudson City where there were not enough news days, to conduct these bank-specific regressions. There were a few cases where there appears to be some reverse-causality but for the most part the evidence is limited. In particular, the contemporaneous daily excess return is significant at the 10% level for BBT and at the 5% level for Comerica; the lagged daily excess return is significant at the 10% level for Fifth Third and at the 5% level for KeyCorp and Washington Mutual. The lagged raw return is significant at the 10% level for Countrywide, KeyCorp, National City, Regions Financial, and US Bancorp, and at the 5% level for Fifth Third and Washington Mutual. The contemporaneous raw return is significant at the 10% level for Washington Mutual. Despite a general lack of statistical significance, the coefficients on the returns variable are negative in all cases except Comerica and Countrywide (meaning a large positive return lowers the probability of high news readership the following day and, perhaps more relevantly for the pre-crisis time period, a large negative return increases the probability of high news readership the following day). Overall, these results provide some limited evidence of correlation in news readership and that large changes in equity price are sometimes followed by high news readership the following day.

Size effects

A question that might arise is the role of firm size in these results, since as noted above larger firms appear in the headlines, and hence garner higher readership, more often. In addition, many large firms were among the ones that suffered the most during the financial crisis. In the panel data analysis, firm fixed effects will capture any variation due to size or other firm-specific effects. Less formally, Figure 8 contains scatterplots of the returns measures versus the logarithm of the firm's total assets as given in Table 1. While there appears to be a negative relationship, it is not as negative as the relationship of returns to the news variables shown in Figure 5.

Data limitations

As noted above, the sample period in this study covers the entire time over which the readership data was collected. That it corresponded roughly to the first year of the financial crisis and in hindsight represented an interesting period of study was happenstance, with regrets that data collection did not continue beyond August 26, 2008. In addition, the definition of "news", as Bloomberg news readership rankings, does not necessarily correspond to others' definitions. Moreover, both the readership and price movements documented here may reflect the availability of information from non-news sources. Because of these limitations, care should be taken in drawing too general conclusions from the results. In particular, it is impossible to know what the banks' equity performance would have been without such news -- that it could have been worse remains a possibility.

VI. Conclusions

This paper has investigated the relationship between news coverage and equity returns in the banking sector during the run-up to the financial crisis. By employing a unique dataset on readership rankings, the analysis is able to identify cross-sectional differences between news and non-news as well as explore market reactions over time. Although it is premature to draw causal conclusions based on this analysis, the results clearly identify large differences in the experiences of firms that dominated Bloomberg readers' attention versus those that were less in the spotlight. Importantly, the finding that average next-day returns after a firm was in the news were nearly 2000 basis points (20 percentage points) lower compared to average next-day returns after a firm did not make the rankings seems to provide evidence of an immediate reaction to publication of Bloomberg news stories about some of the firms that were at the center of the financial crisis. These results are consistent with those of Fang and Peress (2008) who "...find that stocks with no media coverage earn higher returns than stocks with high media coverage even after controlling for well-known risk factors."

As noted in the introduction, an important limitation of the Bloomberg readership data is that it does not distinguish between “good” and “bad” news. Hence the results in this paper contribute more to the literature related to media attention of being in the headlines, rather than the possible asymmetric effects associated with different types of news (e.g., Tetlock (2007), Tetlock et al (2008)). This limitation also applies to much of the previous literature on news effects, e.g., Mitchell and Mulherin (1994), Jones, Lamont, and Lumsdaine (1998). The results, however, are consistent with results from the marketing literature that consumers display more optimism when given vague rather than precise information (e.g., Mishra, Shiv, and Nayakankuppam 2008) since the category of “no-news” used in this paper is only an indication that the extent of news readership is unobserved/censored and hence more vague than if a firm appears in the readership rankings. By considering the sample period used in this study, the results are also related to the findings of the news impact curve literature (e.g., Campbell and Hentschel 1992, Engle and Ng 1993, Parker and Li 2006), that asymmetries exist with respect to the impact of good and bad news on returns. Given the severe bear market characterized by the approximately 40% decline in the S&P500 Financials Index during both the contemporaneous and subsequent periods studied in this paper, as well as the significant challenges that most of the institutions in the sample faced, it is likely that greater news attention during the period studied was associated with negative news while less news attention was associated with relatively less bad news. If one accepts the Parker and Li (2006) result that “Good news does not lift the market as much as bad news depresses it. Also, bad news during a bear market has a bigger negative impact than bad news during a bull market”, then the findings in this paper suggest that being in the headlines may have exacerbated the difficulties that some of the firms faced, although without being able to observe whether each appearance in the readership rankings was good or bad news, one cannot say definitively. At the very least, however, the results indicate that greater Bloomberg news readership attention/visibility was associated with lower equity returns of large bank stocks in the beginning of the financial crisis, suggesting that headlines contributed to both the contemporaneous and subsequent market perception of these firms.

As work on this paper has progressed, it has become apparent that the results may have implications for a number of legal cases related to the potential release by the Federal Reserve of confidential information to news outlets. On November 7, 2008, Bloomberg LP, the parent company of Bloomberg News, filed suit under the Freedom of Information Act (FOIA) seeking to force the Federal Reserve to disclose information related to institutions that had participated in a variety of Federal Reserve lending facilities (Bloomberg, L.P. v Board of Governors of the Federal Reserve System 2009). Around the same time (November 10 and November 18), representatives from Fox News Network submitted similar FOIA requests to the Federal Reserve Board. In the ruling outlining his decision, U.S. District Judge Alvin Hellerstein notes that “Not long prior to receiving Fox’s request, the Board had received and processed nineteen different FOIA requests regarding substantially overlapping information...” (Fox News Network LLC v Board of Governors of the Federal Reserve System 2009).

In denying the initial disclosure requests, the Federal Reserve cited, among other things, FOIA exemption 4, arguing that the release of such confidential information could cause competitive harm to the institutions. Judge Hellerstein concurred in ruling in favor of the Federal Reserve, noting that “The Board’s concerns, that rumors are likely to begin and runs on banks are likely to develop, cannot be dismissed.” (Fox News Network LLC v Board of Governors of the Federal Reserve System). In contrast, in the ruling outlining why she had decided against the Federal Reserve (“the agency”) in favor of the plaintiffs, Chief U.S. District Judge Loretta Preska noted, “The agency must provide evidence that if the requested information is disclosed, competitive harm would be ‘imminent’”. She goes on to explain that, “Nor does the Board point to an immediate risk of competitive harm...” and that “Conjecture, without evidence of imminent harm, simply fails to meet the Board’s burden of showing that Exemption 4 applies” (Bloomberg LP v. Board of Governors of the Federal Reserve System 2009).

The results in this paper speak directly to the Judges’ comments by considering (a) whether the attention garnered by Bloomberg news stories is immediately reflected in a bank’s equity prices, and (b) the sign of any risk premium that might be associated with such attention. Since the information to which these cases refer has never been publicly disclosed in the US, an assessment of the impact of its release is beyond the scope of this paper and nothing in this paper should be interpreted as taking a view either way on the merits of these cases. In particular, we recognize the delicate balance between concerns that competitive harm might result from once-confidential information entering the public domain versus a need for transparency and disclosures that would enable consumers, investors, and financial market participants to make informed decisions, and the challenges involved with striking the appropriate balance. The analysis in this paper merely provides some evidence of an immediate and significant negative impact of (publicly available) Bloomberg news stories on the particular sample of banks during the time period considered. Given the time period studied, however, where much of the news on banks was negative, it is plausible that stories with high readership exacerbated equity prices of already fragile firms. The results here suggest that release of the information to Bloomberg at the time it was requested likely would have had a negative impact, particularly in the aftermath of the experience of Northern Rock in August 2007 (Llewellyn 2009), consistent with Judge Hellerstein’s opinion.

Caution is warranted in drawing definitive conclusions from the results of this one study, however. The data sample of news readership is collected over a small subset of banks over a very specific time period and prior to the events described in these cases. Therefore, the results and associated inference cannot necessarily be extended to other types of information or to news stories more broadly.

Nonetheless, this paper speaks to the likelihood of competitive harm to large US banks in conjunction with Bloomberg news stories about them during the period August 16, 2007 – August 26, 2008, roughly the

first year of the crisis. As this paper was going to press, on September 30, 2009, the Federal Reserve Board (“Board”) filed its appeal of the decision in the *Bloomberg v Board of Governors of the Federal Reserve System* (2009) case.²⁰ The debate over this issue continues.

²⁰ The Clearing House LLC, an industry association, provided evidence in support of the Board’s position and was granted permission to intervene (hence it is named Intervenor-Defendant-Appellant in the appeal).

References

- Allen, Franklin and Elena Carletti (2008), "The Role of Liquidity in Financial Crises," unpublished working paper.
- Bajaj, Vikas, and Louise Story (2008), "It's 3P.M. on Wall Street. The Hungry Bear Is on the Prowl.," *The New York Times*, October 16, available at <http://www.nytimes.com/2008/10/16/business/16markets.html?pagewanted=print>
- Birz, Gene, and John R. Lott, Jr. (2008), "The Effect of Macroeconomic News on Stock Returns: New Evidence from Newspaper Coverage," unpublished working paper.
- Bloomberg LP v. Board of Governors of the Federal Reserve System (2009), 08-CV-9595, U.S. District Court, Southern District of New York (Manhattan), filed 8/24/09.
- Board of Governors of the Federal Reserve System (2007), "Top 50 Bank Holding Companies," June 30, 2007. Current quarter available online at <http://www.ffiec.gov/nicpubweb/nicweb/Top50form.aspx>
- Board of Governors of the Federal Reserve System (2009), "The Supervisory Capital Assessment Program: Overview of the Results," May 7.
- Board of Governors of the Federal Reserve System (various dates), "Large Commercial Banks", available at <http://www.federalreserve.gov/releases/lbr/>
- Brandt, Michael W., Runeet Kishore, Pedro Santa-Clara, and Mohan Venkatachalam (2008), "Earnings Announcements are Full of Surprises," unpublished working paper, available at SSRN: <http://ssrn.com/abstract=909563>
- Brunnermeier, Markus K., "Deciphering the Liquidity and Credit Crunch 2007-2008," *Journal of Economic Perspectives* 23(1), 77-100, available at: http://www.princeton.edu/~markus/research/papers/liquidity_credit_crunch.pdf
- Campbell, John Y., and Ludger Hentschel (1992), "No News is Good News: An Asymmetric Model of Changing Volatility in Stock Returns," *Journal of Financial Economics* 31, 281-318.
- Chan, Wesley S. (2003), Stock Price Reaction to News and No-News: Drift and Reversal After Headlines," *Journal of Financial Economics* 70, 223-260.
- Condon, Christopher, and Sree Vidya Bhaktavatsalam (2009), "Bill Miller Favors U.S. Financial Stocks for the Next Two Years," *Bloomberg News*, May 7, available at <http://www.bloomberg.com/apps/news?pid=20670001&sid=aYcIyJ3oX4RI>
- Damato, Karen, and Diya Gullapalli (2009), "Managed Funds Offer Little Cover From the Bear," *Wall Street Journal*, April 5, available at <http://online.wsj.com/article/SB123889089021689987.html>
- Engle, Robert F., and Victor K. Ng (1993), "Measuring and Testing the Impact of News on Volatility," *Journal of Finance* 48(5), 1749-1778.
- Fang, Lily, and Joel Peress (2008), "Media Coverage and the Cross-Section of Stock Returns," forthcoming, *Journal of Finance*.
- Fox News Network, LLC v. Board of Governors of the Federal Reserve System (2009), 09-CV-272, U.S. District Court, Southern District of New York (Manhattan), filed 7/30/09.

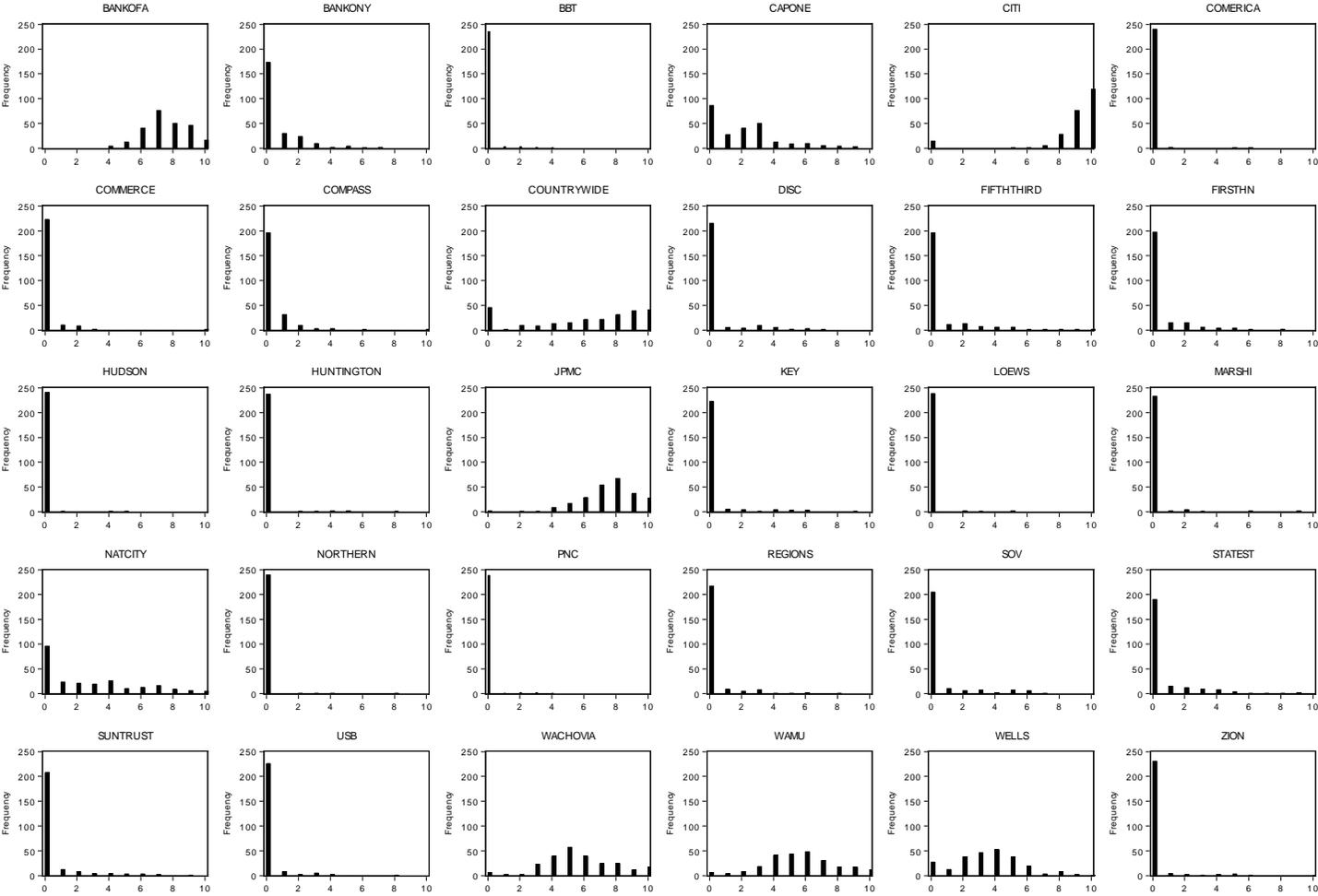
- Jones, Charles M., Owent Lamont, and Robin L. Lumsdaine (1998), "Macroeconomic News and Bond Market Volatility," *Journal of Financial Economics* 47, 315-337.
- Llewellyn, David T. (2009), "The Northern Rock Crisis: A Multi-Dimensional Problem," in *The Failure of Northern Rock: A Multi-Dimensional Case Study*, Franco Bruni and David T. Llewellyn (eds.) 13-32. Vienna: SUEF (SUEF Studies: 2009/1).
- Lucca, David O., and Francesco Trebbi (2009), "Measuring Central Bank Communication: An Automated Approach with Application to FOMC Statements," National Bureau of Economic Research working paper #15367.
- Meschke, J. Felix (2004), "CEO Interviews on CNBC," unpublished working paper, Arizona State University.
- Mishra, Himanshu, Baba Shiv, and Dhananjay Nayankankuppam (2008), "The Blissful Ignorance Effect: Pre- versus Post-action Effects on Outcome Expectancies Arising from Precise and Vague Information," *Journal of Consumer Research* 35, 573-585.
- Mitchell, M., and J. Mulherin (1994), "The Impact of Public Information on the Stock Market," *Journal of Finance* 49, 923-950.
- Parker, John C., and CoCo Huirong Li (2006), "How Bad is Bad News; How Good is Good News," unpublished working paper.
- Ryan, Timothy P. (2009), "Multi-period Excess Returns," CFA Institute, available at http://www.cfainstitute.org/memresources/communications/ipm/2009/may/article_1.html
- Swagel, Phillip (2009), "The Financial Crisis: An Inside View," forthcoming, *Brookings Papers on Economic Activity*, spring 2009 conference draft available at: http://www.brookings.edu/economics/bpea/~media/Files/Programs/ES/BPEA/2009_spring_bpea_papers/2009_spring_bpea_swagel.pdf
- Taylor, John B. (2009), "The Financial Crisis and the Policy Responses: An Empirical Analysis of What Went Wrong," National Bureau of Economic Research working paper 14631, January.
- Tetlock, Paul C. (2007), "Giving Content to Investor Sentiment: The Role of Media in the Stock Market," *Journal of Finance* 62, 1139-1168.
- Tetlock, Paul C., Maytal Saar-Tsechansky, and Sofus Macskassy (2008), "More Than Words: Quantifying Language to Measure Firms' Fundamentals," *Journal of Finance* 63(3), 1437-1508.
- Thompson, Simon (2009), "January Sets the Tone for the Rest of the Year," *Financial Times*, January 3, available at <http://www.ft.com/cms/s/2/89001f20-d8e8-11dd-ab5f-000077b07658.html?ftcamp=rss>
- White, Halbert (1980), "A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity," *Econometrica* 48, 817-838.

TABLE 1: Description of firms in the sample

Name	Ticker Code	Size Rank	Total Assets (US\$m)	Total Market Capitalization (US\$m)
Bank of America	BAC	2	\$1,534,359	\$226,481
Bank of New York	BK	14	\$126,333	\$30,750
BBT	BBT	13	\$127,577	\$22,250
CapitalOne Financial	COF	10	\$145,938	\$31,110
Citigroup	C	1	\$2,220,866	\$253,950
Comerica	CMA	22	\$58,570	\$9,217
Commerce Bancorp	CBH	25	\$48,176	\$6,371
Compass Bankshares/BBVA	CBSS	30	\$34,882	\$9,039
Countrywide Financial	CFC	8	\$216,822	\$19,888
Discover Financial Services	DFS	29	\$35,673	NA
Fifth Third Bancorp	FITB	17	\$101,390	\$21,282
First Horizon National	FHN	27	\$38,394	\$5,222
Hudson City Bancorp	HCBK	26	\$39,691	\$6,986
Huntington Bankshares	HBAN	28	\$36,421	\$5,150
JP Morgan Chase	JPM	3	\$1,458,042	\$165,280
Keycorp	KEY	18	\$92,967	\$14,781
Loews Corp	LTR	20	\$79,538	\$24,397
Marshall and Isley	MI	23	\$58,298	\$11,891
National City Corporation	NCC	11	\$140,636	\$22,182
Northern Trust	NTRS	21	\$59,610	\$13,195
PNC Financial Services Group	PNC	15	\$125,651	\$24,902
Regions Financial	RF	12	\$137,623	\$25,531
Sovereign Bancorp	SOV	19	\$82,737	\$12,101
State Street Corp	STT	16	\$112,268	\$21,739
SunTrust	STI	9	\$180,314	\$29,604
US Bancorp	USB	7	\$222,530	\$60,924
Wachovia	WB	4	\$719,922	\$105,311
Wells Fargo	WFC	5	\$539,865	\$115,358
Washington Mutual	WM	6	\$312,219	\$35,862
Zions Bancorporation	ZION	24	\$48,691	\$9,217
Total sample of institutions			\$9,136,002	\$1,339,973

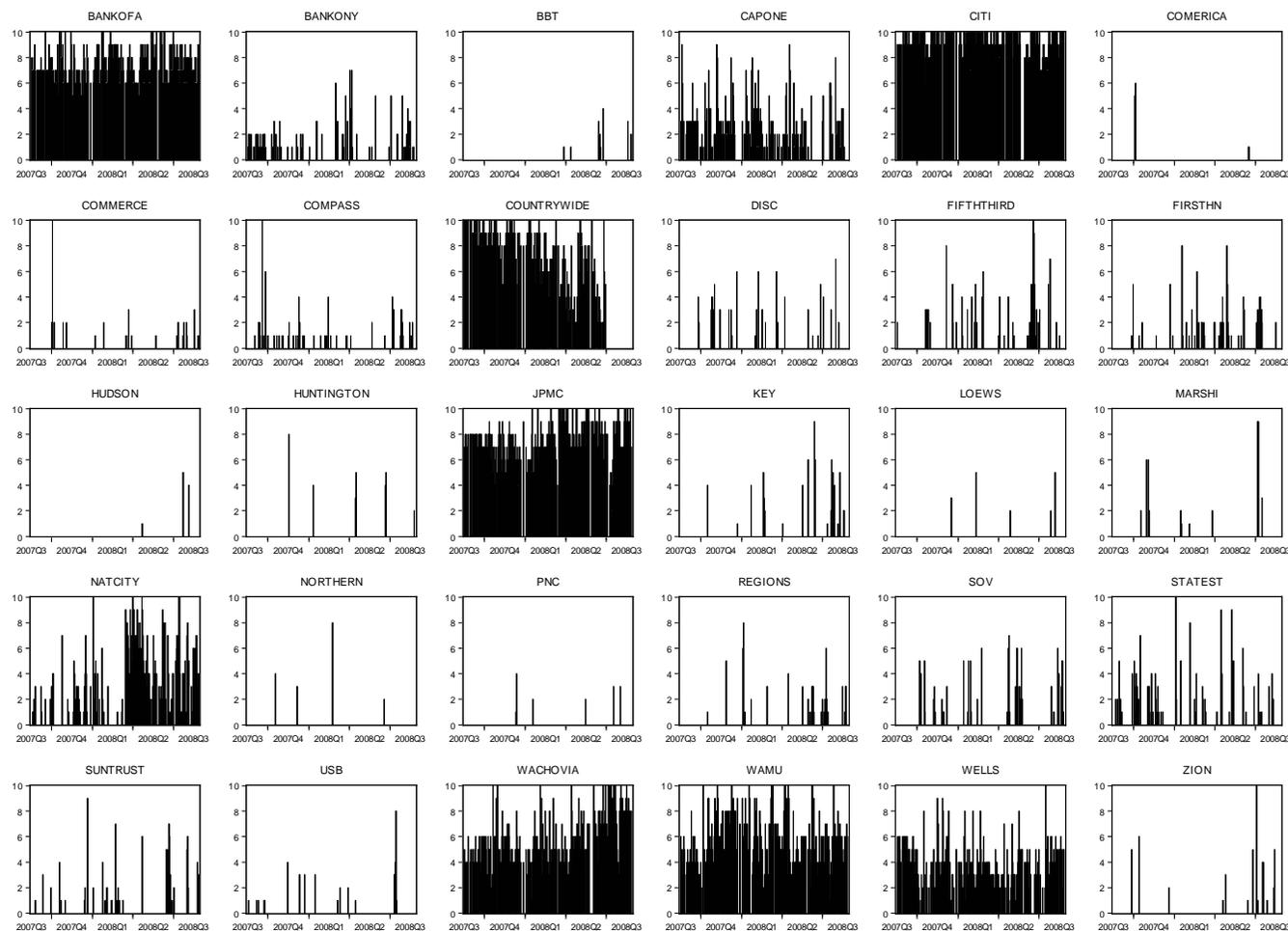
Notes: Information is as of June 30, 2007, Board of Governors of the Federal Reserve System.

FIGURE 1: Histograms of readership rankings, by bank



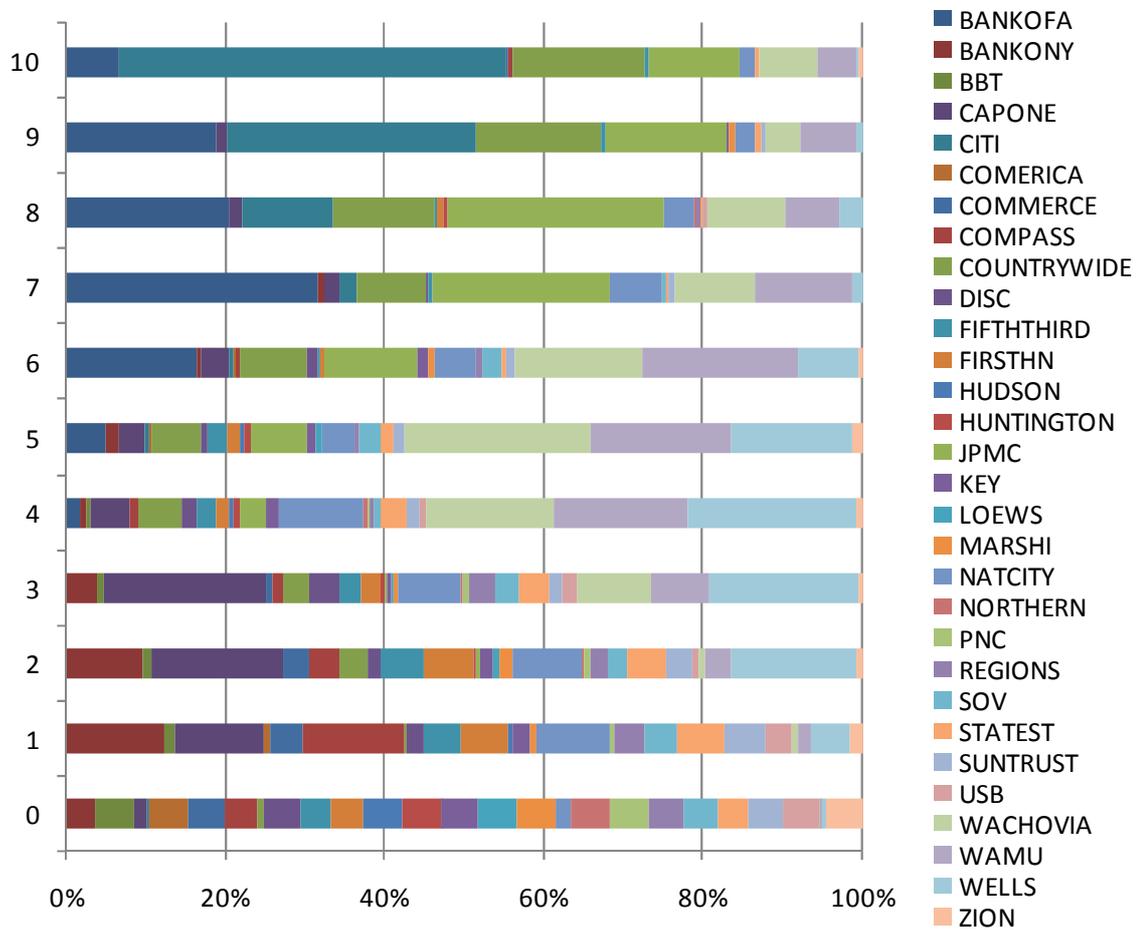
Notes: The pictures show the distribution of days that a bank had each rank, from 0 (did not appear in the rankings) to 10 (highest relative readership that day) over the period August 16, 2007-August 26, 2008. In each picture, the horizontal axis is the ranking and the vertical axis is the number of days.

FIGURE 2: Time series of readership rankings, by bank



Notes: The pictures show the patterns of readership intensity for each bank bank over the period August 16, 2007-August 26, 2008. It is evident that some banks dominated the Bloomberg news headlines while others were the subject of readership focus for only brief and isolated periods. In each picture, the vertical axis is the readership ranking, ranging from 0 (did not appear in the rankings) to 10 (highest ranking for the day).

FIGURE 3: Distribution of firms within each rank



Notes: This picture shows the percentage of each rank corresponding to each of the 30 banks in the sample. Recall that ranks 1-10 correspond to one firm each day while the 0 rank is used for firms that do not appear in the customized readership list. Therefore the number of observations corresponding to the zero rank is greater than the number of observations in the other ranks (the latter is equal to the number of days in the sample). With the exception of Bank of America, that appeared in the readership rankings on every day in the sample, the distribution of firms that were not ranked is relatively even. For other rank levels, however, it is evident that some ranks, particularly the highest, were dominated by a few firms.

TABLE 2: Descriptive statistics on Bloomberg news readership and sample period equity returns, by bank

	BAC	BK	BBT	COF	C	CMA	CBH	CBSS	CFC	DFS
Indicator avg full sample	7.47	0.62	0.08	2.02	8.79	0.05	0.17	0.35	5.95	0.39
% of days in news	100.0	29.1	36.8	64.8	94.3	1.6	8.6	19.7	81.6	11.9
Indicator avg if newswday	7.47	2.13	2.11	3.12	9.32	3.25	2.00	1.79	7.30	3.28
% stock return full sample	-42.1	-19.4	-28.6	-35.5	-63.0	-53.2	NA	NA	NA	-32.5

	FITB	FHN	HBAN	HCBK	JPMC	KEY	LTR	MI	NCC	NTRS
Indicator avg full sample	0.62	0.50	0.04	0.13	7.47	0.30	0.07	0.18	2.63	0.07
% of days in news	19.7	19.3	1.2	2.9	99.2	8.6	2.0	4.5	60.7	1.6
Indicator avg if newswday	3.17	2.57	3.33	4.43	7.53	3.52	3.40	3.91	4.34	4.25
% stock return full sample	-60.8	-67.6	31.7	-59.4	-20.1	-67.2	-5.9	-59.1	-83.4	22.1

	PNC	RF	SOV	STT	STI	USB	WB	WAMU	WFC	ZION
Indicator avg full sample	0.06	0.30	0.53	0.68	0.46	0.18	5.68	5.57	3.43	0.20
% of days in news	2.5	11.1	16.0	22.1	15.2	7.4	97.5	97.5	88.9	5.7
Indicator avg if newswday	2.50	2.67	3.31	3.09	3.03	2.39	5.82	5.71	3.86	3.57
% stock return full sample	-3.1	-72.6	-50.6	5.7	-52.0	-4.1	-70.7	-90.0	-19.6	-66.0

Notes: Bank names corresponding to the ticker symbols used in this table are contained in Table 1. Four metrics related to news readership are presented in this table – (1) “Indicator avg full sample” reports the average NRR ranking over the period August 16, 2007-August 26, 2008, including zeros for days when a firm did not make the top ten customized readership list, (2) “% of days in news” provides the fraction of days in the sample period that the bank was in the rankings, (3) “Indicator avg if newswday” contains the average NRR ranking conditional on appearing in the readership ranking list, and, for the purposes of comparison, (4) “% stock return full sample” gives the firm’s equity return during the period August 16, 2007-August 26, 2008.

TABLE 3: Cross-sectional full-sample correlations, ranking indicators versus returns

Rank measure	Returns measure			
	contemporaneous	arithmetic ER	geometric ER	subsequent
average rank when ranked	-0.235	-0.375	-0.326	-0.392
average rank, full sample	-0.255	-0.357	-0.339	-0.321
fraction of days ranked	-0.286	-0.371	-0.358	-0.251

TABLE 4: Average returns full-sample, by ranking indicator

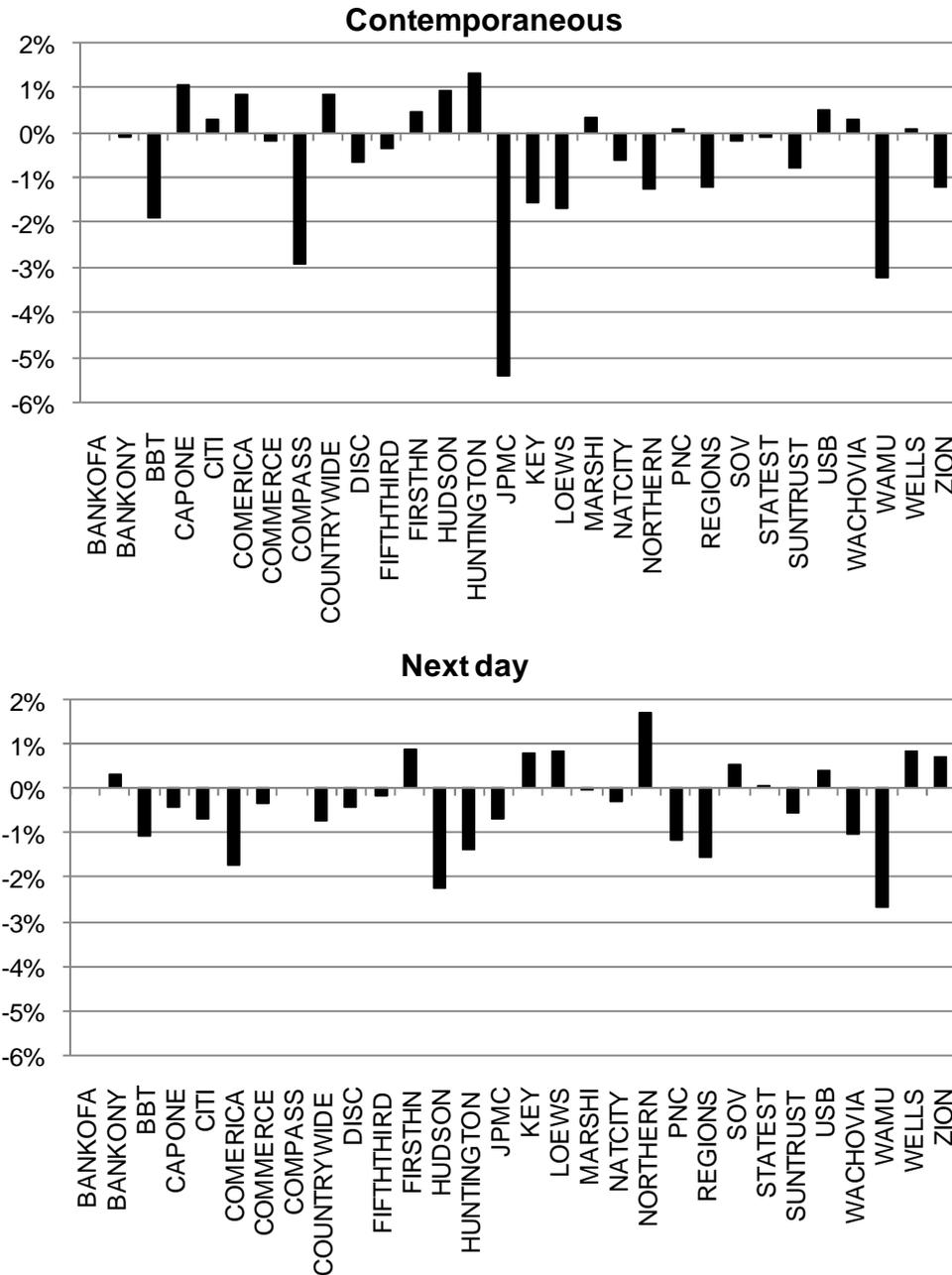
Rank measure	Returns measure			
	contemporaneous	arithmetic ER	geometric ER	subsequent
average ranking >1	-53.1%	-14.6%	-24.5%	-54.4%
average ranking <1	-33.8%	7.6%	12.6%	-38.1%
% of days ranked >10%	-48.4%	-7.6%	-16.2%	-42.7%
% of days ranked <10%	-26.6%	15.96%	24.25%	-41.6%

Notes to tables:

Table 3 contains correlations between rank indicators and various full-sample returns measures across the 30 banks in the sample. “Average rank when ranked” is each bank’s average rank over the sample conditional on being ranked (i.e., non-news days are excluded). “Average rank, full sample” is each bank’s average rank counting days when the bank does not appear in the customized readership list as zero. “Fraction of days ranked” is the percentage of days that a bank appears in the customized readership list at any rank level.

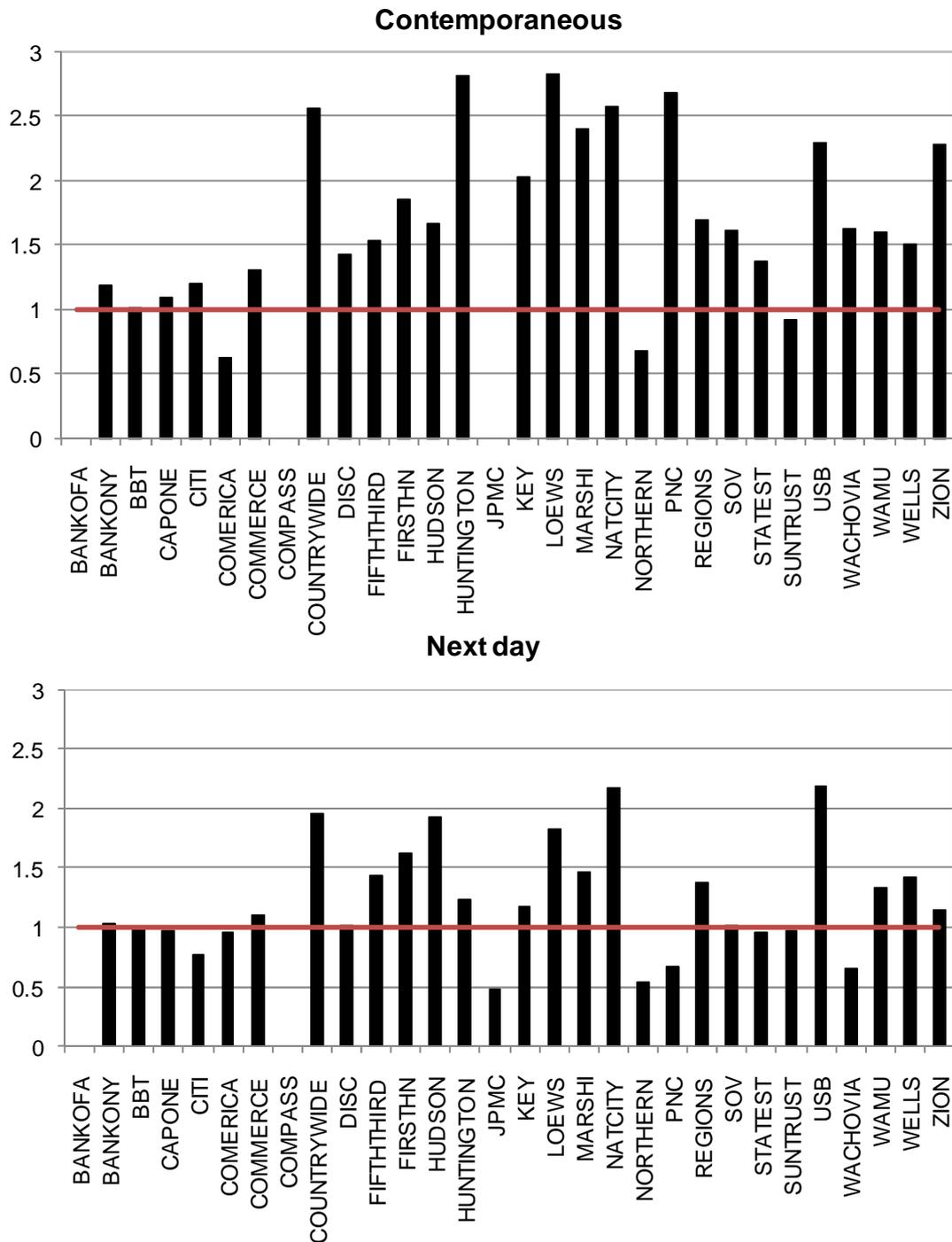
Table 4 contains average returns for subgroups of banks divided by (a) average rank, and (b) % of days ranked. Contemporaneous returns are each bank’s percentage change in its equity share price from August 16, 2007 – August 26, 2008. Subsequent returns are analogously computed over the period August 27, 2008-July 31, 2009. Excess returns report the excess for each bank over the equivalent return on the S&P500 Financials Index during the period August 16, 2007 – August 26, 2008. Arithmetic and geometric excess returns are computed by the respective formulas given in the text.

FIGURE 3: Difference between average daily returns on news days versus non-news days, by bank



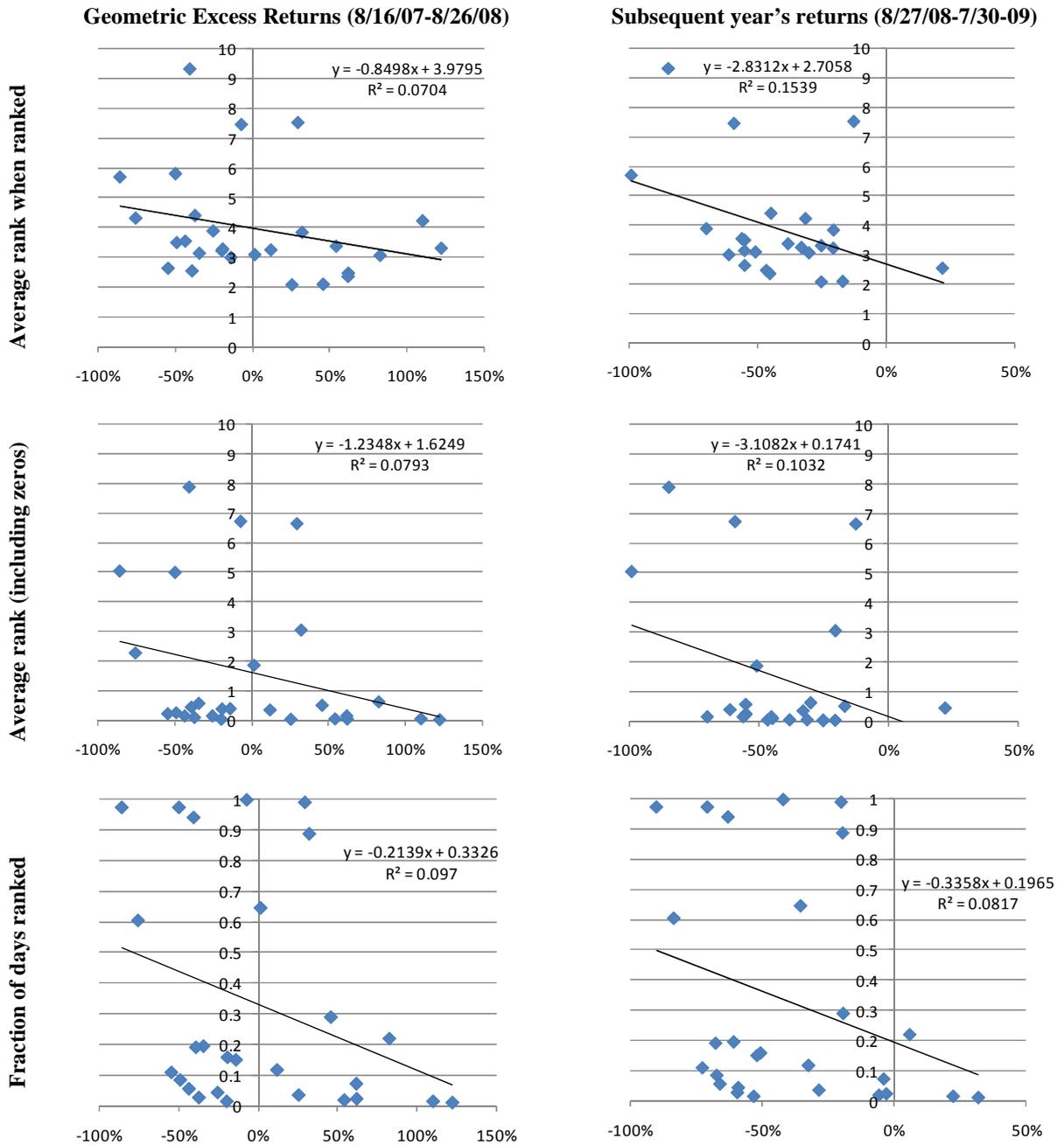
Notes: These charts show the difference between average daily returns on news days versus non-news days, by bank, over the period August 16, 2007-August 26, 2008. There is no bar for Bank of America since it appeared in the customized readership list on all days in the sample. The top graph shows the difference using contemporaneous returns; the bottom graph uses returns on the day following the ranking (since rankings are known at the end of the day). Negative bars indicate that average daily returns were lower related to days when the firm appeared in the readership rankings.

FIGURE 4: Ratio of standard deviation on news days to standard deviation on non-news days, by bank



Notes: These charts show the ratio of the standard deviation of daily returns on news days versus non-news days, by bank, over the period August 16, 2007-August 26, 2008. There is no bar for Bank of America since it appeared in the customized readership list on all days in the sample. The top graph shows the ratio using contemporaneous returns; the bottom graph uses returns on the day following the ranking (since rankings are known at the end of the day). Bars above one indicate that daily returns had higher volatility related to days when the firm appeared in the readership rankings.

FIGURE 5: Full-sample cross sectional comparisons



Notes: The above charts show cross-sectional scatterplots (across banks) of returns (x-axis) versus various measures indicating appearance in the top news rankings (y-axis). The left column of scatterplots are in relation to geometrically cumulated excess returns while the right column are the returns in the period following the sample. “Average rank when ranked”, “Average rank (including zeros)” and “Fraction of days ranked” are defined in the notes to Table 3. Commerce Bancorp, Compass Bancshares, and Countrywide are excluded from all of the charts as they were acquired during the sample period and therefore do not have returns over the full period. For the same reason, National City, Sovereign Bancorp, and Wachovia are excluded from the subsequent returns charts (i.e., the right column).

TABLE 5: Summary statistics: Excess returns, August 16, 2007-August 26, 2008.

<i>Excess Returns, XR_t</i>		<i>Same day as news</i>		<i>Day following news</i>	
	Full sample (N=6688)	Ranked sample (N=2293)	Not-ranked sample (N=4395)	Ranked sample (N=2291)	Not-ranked sample (N=4398)
Mean	-0.023	-0.187	0.063	-0.164	0.043
Std Dev	2.773	3.866	1.971	3.595	2.223
Min	-41.498	-41.498	-18.061	-41.498	-25.699
Max	49.925	49.925	31.738	49.925	32.237
Skewness	0.615	0.524	0.912	0.502	0.895
Kurtosis	46.696	32.962	24.500	39.524	31.226

<i>Sq. Excess Returns XR_t^2</i>		<i>Same day as news</i>		<i>Day following news</i>	
Mean	0.077	0.150	0.039	0.130	0.049
Std Dev	0.520	0.843	0.189	0.801	0.272

<i>Abs. Excess Returns, XR_t</i>		<i>Same day as news</i>		<i>Day following news</i>	
Mean	1.623	2.164	1.341	1.981	1.441
Std Dev	2.248	3.208	1.446	3.004	1.694

Notes:

XR_t is the daily excess return of a firm's equity over the S&P500 Financials Index; squared excess returns and the absolute value of excess returns are also considered as measures of volatility. Returns are expressed in percent, i.e., multiplied by 100.

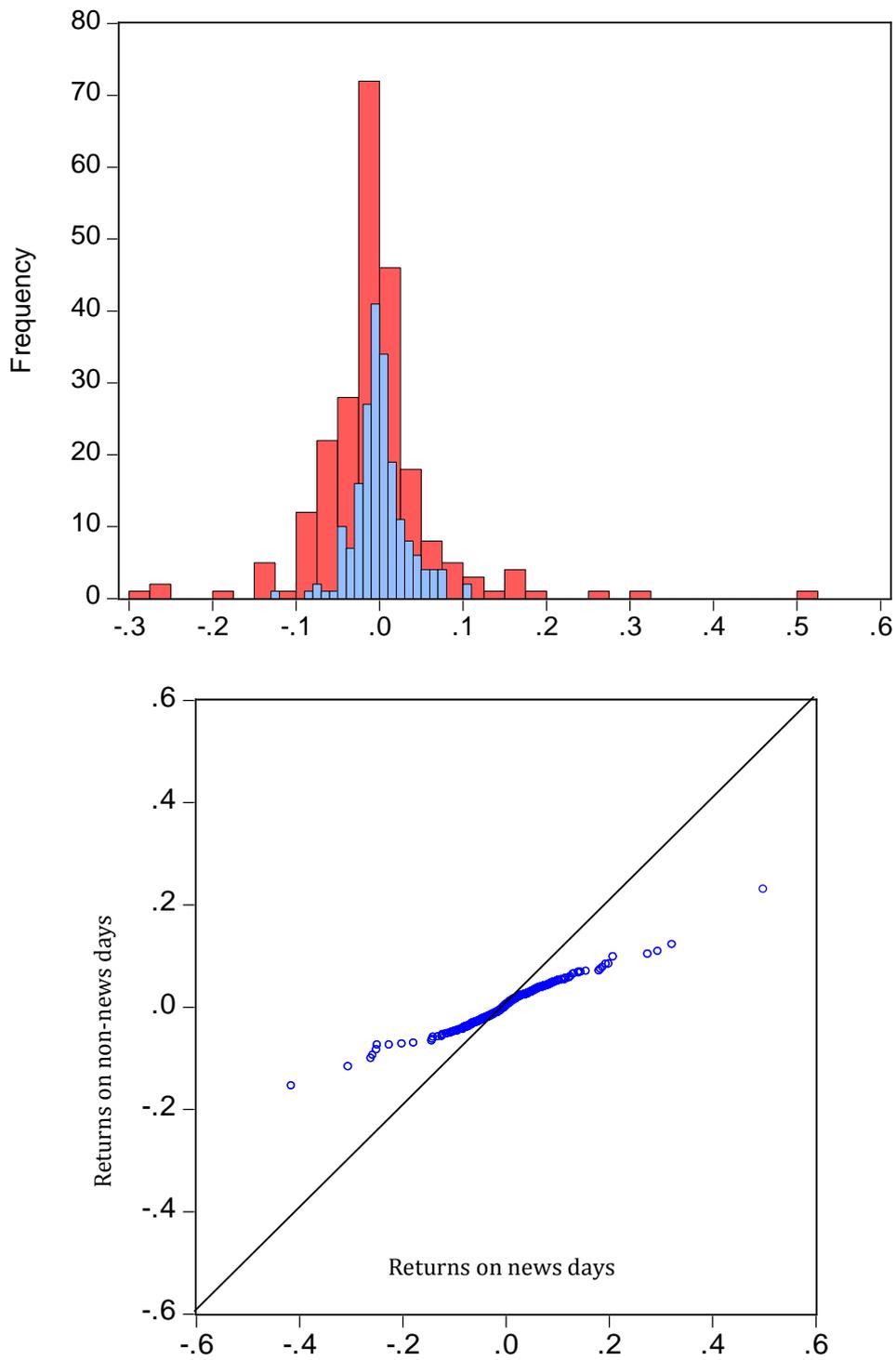
Tests for the equality of means and variances in the news versus no-news samples reject at the 1% level of significance for all three returns measures using "same day" returns and at the 2% level of significance using "subsequent day" returns.

TABLE 6: Bank stock excess returns by appearance in customized NRR list

Mean values of the daily excess return over the S&P500 Financials Index, across all firms, August 16, 2007-August 26, 2008, estimated using a panel Feasible-GLS regression with dummy variables for weekdays and appearance in the “top 10 highest readership” rankings. Returns are expressed in percent, i.e., multiplied by 100. Newsdum is a dummy variable which equals 1 when a firm appears in the “top 10 highest readership” rankings of the customized NRR list consisting of all 30 banks in the sample. XR_t is the daily excess return of a firm’s equity over the S&P500 Financials Index; results using squared excess returns and the absolute value of excess returns are also reported. Use of feasible GLS allows for the presence of cross-sectional heteroskedasticity. Firm fixed effects are included in all regressions. Heteroskedasticity-consistent standard errors are given in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. Note that because Bank of America was in the readership rankings during every day of the sample, it is dropped from regressions containing the news dummy (those labeled (1) below)

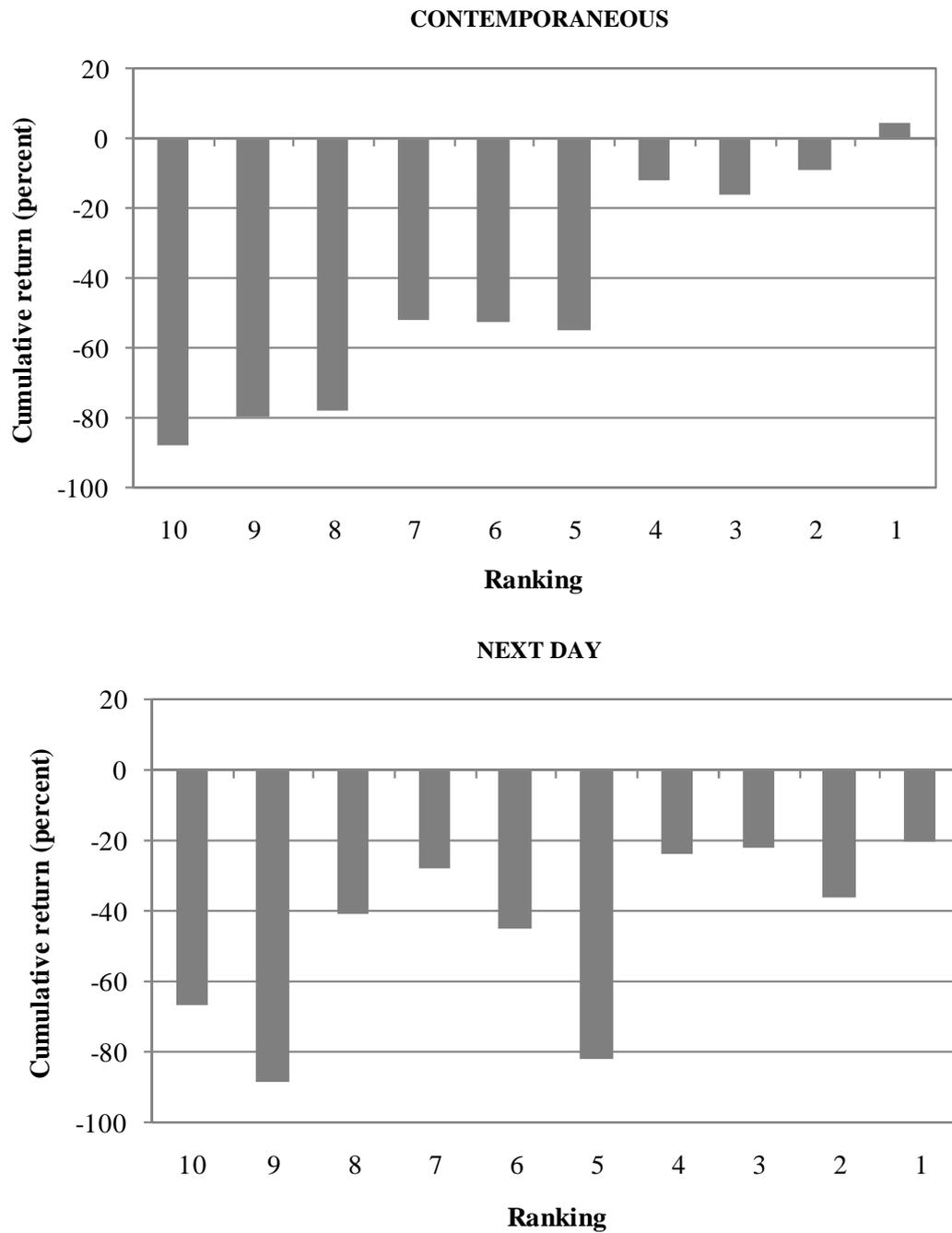
Panel A	Contemporaneous news		Prior day news (lag)		Calm before the storm (lead)	
	Constant	News coefficient	Constant	News coefficient	Constant	News coefficient
(1) News dummy	0.067 (0.046)	-0.262* (0.145)	0.009 (0.050)	-0.107 (0.122)	0.050 (0.051)	-0.239* (0.122)
(2) Actual news ranking	0.131** (0.063)	-0.080** (0.039)	0.028 (0.056)	-0.029 (0.026)	0.097* (0.053)	-0.067** (0.028)
(3) Top 3 dummy	0.002 (0.037)	-0.239 (0.172)	-0.013 (0.042)	-0.134 (0.137)	0.004 (0.042)	-0.338*** (0.124)
Panel B						
<i>Contemporaneous, lead and lag together</i>		Constant	Contemporaneous	Prior day news	Calm before the storm	
(1) News dummy		0.110 (0.074)	-0.191 (0.154)	-0.065 (0.126)	-0.172 (0.124)	
(2) Actual news ranking		0.191** (0.085)	-0.059 (0.043)	-0.008 (0.030)	-0.052** (0.026)	
(3) Top 3 dummy		0.023 (0.043)	-0.158 (0.213)	-0.093 (0.166)	-0.307** (0.147)	
Panel C						
	Contemporaneous	Calm before the storm				
Constant	0.138** (0.064)	0.099* (0.060)				
Rank = 10	-0.802* (0.437)	-0.626** (0.285)				
Rank = 9	-0.775** (0.381)	-0.746** (0.303)				
Rank = 8	-0.553* (0.314)	-0.639** (0.273)				
Rank = 7	-0.465 (0.334)	-0.517* (0.280)				
Rank = 6	-0.652** (0.256)	-0.351 (0.304)				
Rank = 5	-0.676*** (0.238)	-0.294 (0.291)				
Rank = 4	-0.452* (0.239)	-0.016 (0.221)				
Rank = 3	-0.031 (0.211)	-0.082 (0.174)				
Rank = 2	-0.080 (0.179)	-0.282 (0.195)				
Rank = 1	-0.148 (0.198)	-0.217 (0.147)				

FIGURE 6: Comparisons of excess returns, by readership status



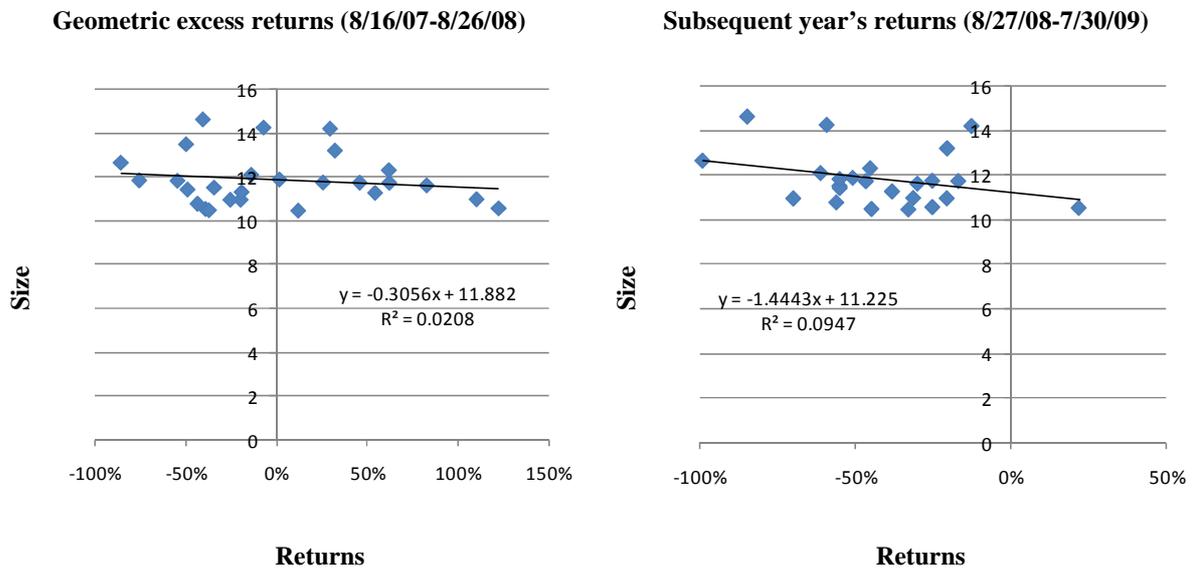
Notes: The top graph shows the histogram of daily excess returns associated with a rank of 1 (the lowest rank to be in the customized readership list – blue bars) versus those associated with a rank of 10 (the highest relative readership intensity – red bars). The bottom graph is a Q-Q plot of the empirical distribution of excess returns associated with not appearing, versus the empirical distribution of excess returns associated with appearing, in the customized readership list.

FIGURE 7: Cumulative returns associated with each ranking, 8/16/2007-8/26/2008



Notes: The charts present cumulative excess returns on portfolios constructed according to the day's rankings, that is, each day the portfolio is long the firm that has the corresponding ranking each day. "Contemporaneous" shows the excess returns if one knew the ranking for the day in advance and could hold a long position as the news on that day evolved; "Next Day" more realistically assumes the long position is held from close on the day the ranking comes out to the close on the following day. Even if a new firm/ranking is not observed on the following day, the position is only held for one business day.

FIGURE 8: Returns versus ln(size)



Notes: The above charts show cross-sectional scatterplots (across banks) of returns (x-axis) versus ln(size) as of the start of the sample (i.e., as of June 30, 2008). The left scatterplot is in relation to geometrically cumulated excess returns while the right column is the returns in the period following the sample. Commerce Bancorp, Compass Bancshares, and Countrywide are excluded from all of the charts as they were acquired during the sample period and therefore do not have returns over the full period. For the same reason, National City, Sovereign Bancorp, and Wachovia are excluded from the subsequent returns charts (i.e., the right column).