THE ACCOUNTING REVIEW
Vol. 87, No. 5
2012
pp. 1679–1708

American Accounting Association
DOI: 10.2308/accr-50189

Voluntary Disclosure Incentives and Earnings Informativeness

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ABSTRACT: We propose that the value of the earnings reporting process as an information source lies in limiting delays in the release of bad news, either by inducing managers to disclose it voluntarily or by directly releasing the negative news that managers have incentives to withhold. We compare earnings informativeness in bad-news and good-news quarters. Using returns to measure news, we find, consistent with our prediction, that earnings informativeness relative to other sources is higher in bad-news quarters than in good-news quarters. Further, cross-sectional tests indicate that earnings differential informativeness in bad-news quarters is more pronounced when managers do not voluntarily disclose the news, information asymmetry is stronger, and managers are net sellers of stock.

Keywords: *earnings; earnings announcements; earnings informativeness; voluntary disclosure.*

JEL Classifications: *G3; M4; M40; M41; M48.*

Data Availability: *Data are available from Compustat, CRSP, First Call, I/B/E/S, ISSM, TAQ, and Thompson Financial.*

I. INTRODUCTION

There is a significant literature on the incremental information content of earnings announcements (Beaver 1968; Bamber 1987). More recently, studies such as Ball et al. (2011) and Beyer et al. (2010) argue that the primary value of earnings lies less in releasing

The paper has benefited from comments given by Yonca Ertimur, John Harry Evans III (senior editor), Michelle Hanlon, Amy Hutton, Mozaffar Khan, S. P. Kothari, Dawn Matsumoto, Bill Mayew, Shiva Rajgopal, Konstantin Rozanov, Terry Shevlin, Susan Shu, Thor Sletten, Rodrigo Verdi, Ross L. Watts, Joe Weber, Paul Zarowin (editor), Jerry Zimmerman, two anonymous referees, the participants at the HBS-MIT, the University of Toronto Conferences, and seminar participants at Boston College, George Mason University, Indian School of Business, The University of Chicago, University of Minnesota, University of Rochester, University of Washington, Washington University at St. Louis, University of Southern California, The Ohio State University, The University of Texas at Dallas, Duke University, and University of Michigan.

This paper was previously circulated as "Managerial Incentives and the Informativeness of Earnings Announcements."

Editor's note: Accepted by Paul Zarowin.

Submitted: July 2010
Accepted: March 2012
Published Online: April 2012

information than in confirming information that has reached the market from alternative sources. Our paper bridges these two (non-mutually exclusive) streams of thought by proposing that the earnings reporting process is geared toward uncovering information that has not as yet been disclosed via alternative sources; in particular, negative information. This "*ex post* settling-up" via earnings is important because it limits managers' ability to delay the release of bad news in two ways. First, the prospect of having to announce earnings at the end of a fiscal period can sometimes induce managers to release bad news voluntarily (Skinner 1997), in which case, the primary role of earnings is confirmation, as in Ball et al. (2011).[1] Second, when managers do not disclose bad news voluntarily, earnings are instrumental in releasing the negative news, and the information content of earnings is important. Overall, the earnings reporting process results in timelier and more precise disclosure of bad news.

We attribute earnings' differential role in revealing bad news relative to good news to managers' voluntary disclosure decisions and the nature of the earnings reporting process. The literature has discussed several possible factors that are likely to provide managers with differential voluntary disclosure incentives with respect to good versus bad news. For example, managers have incentives to preemptively disclose bad news prior to earnings announcements via earnings forecasts over relatively short horizons.[2] Two issues are worth noting in this context. First, short-horizon forecasts are often prompted by the desire to manage the litigation risk and/or the market disappointment arising from the imminent release of the bad news at a forthcoming earnings announcement (Skinner 1994, 1997; Kasznik and Lev 1995; Soffer et al. 2000; Matsumoto 2002; Richardson et al. 2004; Field et al. 2005). Second, besides short-horizon forecasts, voluntary disclosure can also take the form of qualitative disclosures about the firms' operations, press releases about important contracts won or lost, etc. (Miller 2002). Miller (2002) documents that these alternative forms of voluntary disclosures tend to increase (decline) when firm performance improves (deteriorates), suggesting that they are used to convey good news about the firm.[3] In fact, there are a number of reasons discussed in the literature for why managers *delay* disclosures of bad news relative to good news.

Bad-news disclosures are often inherently associated with greater uncertainty in a firm's operations (Li 2006, 2008; Bloomfield 2008; Brown et al. 2009; Ertimur et al. 2011), and tend to be scrutinized more closely by capital market participants. This provides managers with motives to be more precise and careful with their estimates when they disclose bad news, introducing delays in the disclosure. Consistent with this, Graham et al. (2005) document in a survey that top-level executives acknowledge delaying bad-news disclosures to allow themselves time to study and interpret the negative information. Further, negative events often have disproportionately strong implications for stakeholders such as lenders because of asymmetric payoffs in their contracts with the firm (Fama and Miller 1972; Jensen and Meckling 1976). These contracts often rely on earnings performance (Fields et al. 2001; Asquith et al. 2005), increasing the stakeholders' demand for information on the impact of bad news on earnings. As a result, managers may be reluctant to disclose the bad news until they are able to provide a precise estimate of the effect of such news on earnings.

Second, even when the manager is relatively certain about the magnitude of bad news, she may choose to first take corrective action or wait for offsetting good news. In support of this, managers responding to Graham et al.'s (2005) survey admit to delaying bad-news disclosures in the hope

[1] Our evidence suggests that managers prefer to preemptively disclose negative information rather than wait for the earnings announcement, when the magnitude of the negative news is particularly large.

[2] Managers may also expedite bad news disclosures and delay good news disclosures out of a desire to obtain lower option exercise prices prior to option grants (Yermack 1997; Aboody and Kasznik 2000).

[3] Short-horizon forecasts exhibit a reverse pattern, consistent with such forecasts primarily conveying bad news.

that subsequent improvements eliminate the need to make a bad-news disclosure. Third, in some cases, managers can have self-serving motives to delay disclosure of bad news. Kothari et al. (2009) propose that managers' concerns about their careers, compensation packages, and stock-price-based wealth provide them with incentives to disclose good news early and delay bad-news disclosures.

The earnings reporting process plays an important role in the context of delayed voluntary disclosures of bad news. GAAP measurement principles provide guidelines for how to estimate and report losses in future cash flows via earnings components such as warranty and bad debt expenses, asset write-downs, etc. (Basu 1997). These measurement principles provide managers with tools for arriving at more precise estimates of bad news and their impact on earnings. Further, earnings reports are scrutinized by external fiduciary agents such as outside directors, auditors, and regulators. The checks and balances incorporated in the earnings reporting process imply that at least some news that has not been previously disclosed is likely to be released in earnings. Finally, earnings releases are closely scrutinized by investors and financial analysts. In particular, during earnings-related conference calls, analysts and investors question managers about the future implications of current earnings (Tasker 1998; Frankel et al. 1999). The evidence in Matsumoto et al. (2011) indicates that these conference calls are more informative when earnings announcements convey negative news. Further, the greater information content is more a result of scrutiny by capital market participants, such as financial analysts, rather than voluntary disclosures by managers.

In summary, if there are intra-quarter delays in the disclosure of bad news, then the announcement of earnings is expected to reveal at least some of the delayed bad news, with two possible consequences. In certain cases, for example, when the news is particularly negative, managers are prompted by its imminent release at earnings announcements to voluntarily disclose the news prior to the announcement. In the majority of cases when the news is not particularly negative and/or the litigation risk is not high enough to warrant early disclosure, the bad news is conveyed at the time of the earnings announcement. Consequently, when the overall news reaching the market in a quarter is negative, we expect it to be more concentrated around the announcement of earnings at quarter-end than when it is positive, particularly in instances that we observe no issuance of short-horizon forecasts.[4]

In our empirical analysis, we define an announcement quarter as extending from the end of the previous quarter's earnings announcement to the end of the current quarter's earnings announcement. Incremental news released by earnings is captured by returns in the three days around the current quarter's earnings announcement date. We compare the news that reaches the market during the three-day quarterly earnings announcement (QEA) window to that reaching the market during the non-QEA period in the quarter to determine earnings incremental informativeness relative to other information sources. Using a sample of 152,275 firm-quarters over the period 1987–2006, we find that earnings informativeness is higher in bad-news quarters than in good-news quarters.[5] The result is robust to using ranked values of our independent variable to address the issue of outliers, and to controlling for various factors, including firm fixed effects and any potential mechanical bias in our empirical measure. As predicted, earnings differential informativeness in bad-news quarters is concentrated among firm-quarters without short-horizon forecasts.

[4] Importantly, the role of earnings with respect to negative versus positive information, which we examine empirically, is distinct from the one examined by Basu (1997). We focus on earnings' role in the *release* of bad news relative to good news, while Basu (1997) measures earnings' greater timeliness in *recognizing* bad news that may already have been released by other information sources.

[5] For the overall sample, the ratio of news released around QEAs to that in non-QEA periods is around 18 percent for bad-news periods and around 16 percent for good-news periods; that is, earnings are around 12 percent more informative in bad-news quarters.

Our cross-sectional analysis focuses on examining two situations in which earnings are a particularly important source of bad news. First, we predict that earnings play a more pronounced role in the release of bad news among firms with greater information asymmetry between managers and external investors. In such firms, managers are more likely to delay voluntarily releasing negative news, either because their private information is less observable to investors or because the magnitude of bad news is less measurable pending the completion of the earnings reporting process. Second, in periods in which managers sell stock, disclosures of bad (good) news would lead to more unfavorable (favorable) trade outcomes, making it more likely that managers delay disclosures of bad news relative to those of good news.[6] Thus, we predict that earnings differential informativeness is more pronounced among firm-quarters with net insider sales of stock. Our results support our predictions and indicate significant cross-sectional effects. When information asymmetry is in the highest decile (when there are net insider sales), the informativeness of earnings in bad-news quarters is higher than that in good news quarters by as much as 38 percent (23 percent).

In further tests, we find a non-monotonic pattern in earnings differential informativeness across the fiscal quarters, with a peak in the third quarter and a slight decline thereafter in the fourth quarter. We interpret the results as indicating a rise in earnings differential informativeness as the year-end audit approaches over the first three fiscal quarters. However, more intensified efforts at gathering information by market participants in the fourth quarter in anticipation of the imminent release of audited annual results, and more voluntary disclosures by managers in response possibly diminish the role of earnings as a disclosure medium in the fourth quarter.[7] In sensitivity analyses, we find that earnings' differential informativeness persists after excluding firm-quarter observations in which QEAs are accompanied by management forecasts.

The informativeness of earnings has received considerable attention in recent times. The verification and measurement rules underlying financial reporting, along with the scrutiny by fiduciary agents such as auditors and boards of directors, are generally thought to make earnings numbers untimely relative to other information sources and, hence, less informative (Ball and Shivakumar 2008; Ball et al. 2011; Beyer et al. 2010). Our findings indicate that earnings value as an information source does not arise solely from the absolute amount of news that earnings convey to the market. Instead, earnings' incremental usefulness lies in limiting delays in the release of negative news, either by inducing managers to disclose it voluntarily or by directly releasing the bad news that managers withhold. In either case, earnings' information role as discussed in this paper should be of particular interest to standard-setters as they establish fresh measurement principles under the new conceptual framework.

In Section II, we develop our hypotheses. Section III describes the data, empirical design, and descriptive statistics. Section IV discusses primary results, and Section V presents additional analyses. Section VI concludes.

II. HYPOTHESES DEVELOPMENT

Earnings Differential Informativeness

The literature discusses a number of circumstances under which managers can delay disclosures of bad news relative to those of good news. The earnings reporting process can limit

[6] There is considerable evidence that firm insiders possess private information at the time they sell stock (Seyhun 1986; Beneish and Vargus 2002; Ke et al. 2003; Piotroski and Roulstone 2005).

[7] For example, Baginski and Hassell (1990) report that not only do managers issue more forecasts during the fourth quarter, but also that fourth-quarter management forecasts are more influential in generating revisions in analyst estimates of future earnings relative to other quarters.

delays in the release of negative news in two ways. First, the prospect of the eventual release of bad news at the time of the earnings announcement can induce managers to voluntarily disclose the bad news; for example, out of concern for litigation risk. To the extent that bad news remains undisclosed, as is possible when perceived litigation risk is low and/or managers' incentives to delay are more pronounced, the news is released at the time of the earnings announcement. Managers' disclosure incentives and the earnings reporting process are discussed in greater detail below, along with our empirical predictions.

Greater scrutiny by capital markets upon bad-news disclosures, and additional demand for information on the impact of the bad news on earnings from debtholders (Fama and Miller 1972; Jensen and Meckling 1976), can make managers reluctant to disclose the bad news until they can arrive at more precise estimates of its impact. Second, upon observing bad news, managers can take corrective action or wait for offsetting good news before releasing the news to the market (Graham et al. 2005). Finally, a desire to capture private benefits or sustain higher firm valuations can make managers unwilling to disclose bad news immediately (Sletten 2012), consistent with the "stockpiling" of negative information referred to in Hutton et al. (2009). Such motives to delay bad-news disclosures can arise from managers' career and wealth-related concerns (Kothari et al. 2009), or from the tendency to "hype the stock" prior to capital market events such as seasoned equity offerings (Lang and Lundholm 2000).[8]

Disclosure of bad news that has not yet been released through other channels, including voluntary disclosures, is likely at the QEAs for a number of reasons. First, unlike most voluntary disclosures, such as management forecasts, financial statement information is scrutinized by outside directors and auditors before the earnings release. Auditors' and outside directors' reputations are tied to their ability to uncover adverse information. Failure to do so can result in lawsuits and regulatory penalties in addition to reputation loss, as with Arthur Andersen's failure to highlight irregular accounting practices at Enron in 2001. Second, financial reporting by listed firms is regulated, with costs for firms and managers via regulatory investigations, restatements, and personal penalties if accounting practices deviate significantly from acceptable norms (Dechow et al. 1996; Feroz et al. 1991; Palmrose et al. 2004). The checks and balances imposed on financial statements imply that to the extent that bad news affects contemporaneous earnings, managers' ability to conceal it, particularly across multiple successive periods, is likely limited (Xie 2001; Barton and Simko 2002). Finally, GAAP measurement rules provide a framework for the estimation of future cash flow losses based on managers' private information when reporting earnings, for example, via bad debt provisions, warranty expenses, inventory write-offs, etc. Such conservative measurement rules (Watts and Zimmerman 1976; Watts 2003) can amplify the role of earnings reports in releasing bad news.[9]

Delayed disclosures of bad news relative to good news, GAAP measurement principles and practices, and the checks and balances characterizing the earnings reporting process will result in earnings playing a greater role in the release of bad news than good news. Specifically, we predict that a greater proportion of news reaching the market in a given quarter is released at the time of the earnings announcement when the news is negative than when the news is positive. We use the sign of the quarterly return to proxy for the sign of the news reaching the market during the quarter. Earnings informativeness is measured as the proportion of news reaching the market at the time of

[8] In a slightly different context, Miller (2002) points out that the general desire to maintain high valuations makes it more likely for firms to issue disclosures when they are experiencing performance gains than when they are experiencing performance declines.

[9] A substantial literature argues that conservative reporting and auditing practices arise in equilibrium as an offsetting mechanism to any propensity of managers to delay the release of bad news relative to that of good news (Devine 1963; Watts and Zimmerman 1976; Antle and Nalebuff 1991).

the QEA relative to that during the non-QEA period in that quarter. Our first hypothesis can be formally stated as follows:

H1: Earnings informativeness is higher when the overall news reaching the market during a quarter is negative than when it is positive.

We emphasize that H1 is based on earnings releasing new negative information to investors, rather than on recognizing negative information that investors are already aware of. Basu (1997) describes how one implication of conservatism in reporting and auditing practices is the asymmetric timeliness of earnings in recognizing bad news relative to recognizing good news. The key difference between the differential informativeness of earnings and asymmetric timeliness as investigated by Basu (1997) is that the former attempts to capture the timing of the news release within the quarter, while the latter does not. Specifically, earnings informativeness as measured in this paper is higher when the proportion of news released at the time of the QEA relative to the non-QEA period is greater. However, earnings asymmetric timeliness can be high even if all news in the quarter reaches the market prior to the QEA, but earnings *recognize* the bad news in a timelier manner than the good news. In a study that investigates earnings' incremental information content, McNichols (1988) documents that earnings announcement returns are less positively skewed than returns during similar-length windows in non-announcement periods. However, she also reports that the frequency of negative announcement returns is lower than that of negative non-announcement-period returns. As a result, this evidence is insufficient to conclude whether earnings are a more important source of bad news than good news.

Cross-Sectional Variation

In this section, we discuss cross-sectional predictions arising from H1. Our primary cross-sectional analyses focus on identifying situations in which bad news revelations from information sources other than earnings (e.g., voluntary disclosures) are likely to be limited. We focus on two cross-sectional partitions based on: (1) information asymmetry, and (2) net sale of stock by insiders.

With greater information asymmetry between managers and external investors, investors are less likely to be cognizant of managers' privately observed news, providing managers with greater opportunities to delay the release of negative private information. We expect information asymmetry between managers and investors to be higher among firms with smaller size, lower analyst following and institutional ownership, lower liquidity, and greater idiosyncratic volatility (Collins et al. 1987; Foster and Viswanathan 1993; Bushee and Noe 2000; Jiang et al. 2005). Such firms are also likely to operate in economic environments characterized by greater uncertainty. Greater uncertainty, in turn, can make managers delay disclosures of bad news until the earnings reporting process generates more precise estimates of bad news. In either case, we predict that the greater the information asymmetry, the more pronounced is the role of earnings in disclosing bad news relative to good news.

H2: Earnings differential informativeness during bad-news quarters relative to good-news quarters is higher among firms with greater information asymmetry.

Our primary hypothesis (H1) does not necessarily require that managers are opportunistic or strategic with respect to their own short-term monetary incentives. The delays in bad-news disclosures could arise from perceived benefits of measuring the bad news with greater precision or attempting to reverse the bad news. However, managers' incentives can also be self-serving, as when managers are net sellers of stock in a given period. There is significant evidence in the literature that at the time of insider trades, managers possess undisclosed private information (Seyhun 1986; Noe 1999; Ke et al. 2003), particularly regarding future earnings (Beneish and

Vargus 2002; Piotroski and Roulstone 2005). We expect that managers' incentives to delay disclosures of any negative information they possess are stronger in the quarters in which they are also net sellers of stock. We accordingly test whether earnings' incremental role in releasing bad news relative to good news is more pronounced in firm-quarters with net insider sales.

H3: Earnings' differential informativeness during bad-news quarters relative to good-news quarters is higher in quarters with net insider sales of firm stock.

III. DATA, EMPIRICAL PROXIES, AND DESCRIPTIVE STATISTICS

Data

To construct our sample, we begin with all firm-quarters in Compustat with earnings announcement dates, and sufficient data to calculate market value of equity (MVE), book value, and leverage. We also require daily returns data from CRSP to compute quarterly returns, earnings announcement returns, and idiosyncratic return volatility. Analyst following is obtained from I/B/E/S, while institutional ownership and insider trade data are obtained from Thomson Financial, and are set equal to 0 when not available. Finally, bid-ask data are obtained from the Institute for the Study of Security Markets database (ISSM) for years 1987–1992, and from the NYSE Trades and Quotes database (TAQ) for years 1993–2006. Since common coverage in these databases starts in 1987, our sample includes 152,275 firm-quarters over the 80 quarters from 1987 to 2006, and comprises 10,204 individual firms. In additional tests, we supplement our data with management forecasts obtained from First Call. Since First Call provides little coverage in early years, our additional tests incorporate firm-quarters starting from 1995.

Measuring Informativeness of Earnings Announcements

We measure news using equity returns.[10] Earnings announcement returns (EAR_t) are defined as the market-adjusted buy-and-hold returns over the three days from Day −1 to Day +1, where Day 0 is the quarterly earnings announcement (*QEA*) date. Quarterly returns (RET_t) are defined as the market-adjusted buy-and-hold returns starting two days after the earnings announcement of Quarter $t-1$ and ending one day after the announcement of Quarter t.[11] The mean length of the period over which RET_t is computed is around 63 trading days. Non-earnings-announcement returns ($NEAR_t$) are estimated as $(1 + RET_t)/(1 + EAR_t) - 1$.[12]

[10] Returns are a comprehensive measure of news released both by earnings and by other sources in the non-earnings-announcement period. Returns around earnings announcements capture both the information released by earnings itself, as well as the additional information managers often release with earnings announcements (including that via conference calls) to facilitate understanding of the implications of earnings information (Chen et al. 2002; Frankel et al. 1999). Further, during the non-earnings-announcement period, returns capture the net information released by various sources: alternative forms of managerial disclosures such as earnings forecasts and non-earnings-related qualitative disclosures, as well as information searches by third parties such as financial analysts.

[11] We require at least 25 days with trading to compute *RET*. The market adjustment involves subtracting the buy-and-hold return on the CRSP value-weighted market index from the corresponding buy-and-hold return of the firm. We also conducted robustness analyses with size and book-to-market adjusted returns, instead of market-adjusted returns. This adjustment involves partitioning firms into five equal groups of size and book-to-market, thus, yielding 25 size and book-to-market portfolios. The adjusted return for a firm is then the daily raw return in excess of the daily return on the matching size and book-to-market portfolio. All our subsequent results, including those we obtain in the cross-sectional tests, are robust to using this alternative adjustment.

[12] We check the robustness of our analysis to two alternative definitions of the earnings announcement window. In the first, we estimate *EAR* over Day −3 to Day +3 with respect to the QEA. In the second, we acknowledge that a longer window is especially suitable for smaller firms, and estimate *EAR* over Day −3 to Day +3 for firms below median size, while using Day −1 to Day +1 for firms above median size. In both specifications, the estimation of *NEAR* is adjusted accordingly. All our results are robust to both of these specifications.

TABLE 1

Distribution of *NEWS_RATIO*

Descriptive Statistics	*NEWS_RATIO*			*Ln*(*NEWS_RATIO*)		
	Full Sample	***BNEWS* = 1**	***BNEWS* = 0**	**Full Sample**	***BNEWS* = 1**	***BNEWS* = 0**
Percentiles						
0.01	0.478	0.540	0.420	−0.754	−0.611	−0.859
0.05	2.296	2.697	1.999	0.831	0.992	0.693
0.25	12.670	14.400	11.160	2.539	2.668	2.412
0.50	32.800	35.630	29.970	3.491	3.573	3.400
0.75	84.620	86.350	82.360	4.438	4.458	4.411
0.95	451.878	420.694	483.424	6.113	6.042	6.181
0.99	1,132.160	1,121.850	1,136.290	7.032	7.023	7.036
Mean	100.030	97.830	102.320	3.467	3.542	3.414
n of firm-quarters	152,275	77,723	74,552	152,275	77,723	74,552

Table 1 provides descriptive statistics for *NEWS_RATIO* and *Ln*(*NEWS_RATIO*).

Variable Definitions:
NEWS_RATIO = 100 ∗ *ABS*(*EAR*)/*ABS*(*NEAR*);
ABS(*EAR*) = absolute value of cumulative market-adjusted returns on trading days −1 to +1 relative to the QEA date;
ABS(*NEAR*) = the absolute value of the cumulative market-adjusted non-earnings-announcement period returns;
Ln(*NEWS_RATIO*) = natural logarithm of *NEWS_RATIO*; and
BNEWS = an indicator variable equal to 1 if overall quarterly return *RET* is negative, and 0 otherwise.

We measure earnings informativeness using a ratio of the news arriving during the QEAs to that arriving during non-QEA periods, denoted as *NEWS_RATIO* and defined as 100 ∗ *ABS*(*EAR*)/*ABS*(*NEAR*). The ratio expresses the absolute value of market-adjusted QEA returns, *ABS*(*EAR*), as a percentage of the absolute value of market-adjusted returns during non-QEA periods, *ABS*(*NEAR*).[13]

We expect *NEWS_RATIO* to be high during quarters when the overall news (measured by quarterly return, *RET*) is negative relative to when overall news is positive. Our prediction is easy to follow if *EAR* and *NEAR* are always of the same sign. When *EAR* and *NEAR* are of differing signs, the analysis is more involved, but *NEWS_RATIO* is still expected to exhibit the same asymmetry. Specifically, for all observations consistent with our hypotheses, *NEWS_RATIO* is expected to be systematically higher in negative-return periods (*RET* < 0) and lower in positive-return periods (*RET* > 0). In contrast, for all observations inconsistent with our hypotheses, *NEWS_RATIO* is expected to exhibit the reverse pattern. Thus, variation in *NEWS_RATIO* is well suited to testing whether earnings informativeness is higher when overall information reaching the market is negative. This is discussed in greater detail in Appendix A.

Table 1 presents the details of the distribution of *NEWS_RATIO* and its logarithmic transformation *Ln*(*NEWS_RATIO*) for the overall sample, as well as separately for bad-news and

[13] *NEWS_RATIO* is unlikely to be affected systematically by post-earnings-announcement drift (PEAD) or the under-reaction of the market to current-period dollar earnings surprises (Foster et al. 1984). PEAD implies that earnings surprises at the time of the QEAs predict returns in the following period; further, most of the "drift" return is realized at the subsequent QEAs (Bernard and Thomas 1989). Thus, in the period of the initial earnings surprise, PEAD is likely to bias our measure of earnings informativeness downward; in the period following the initial earnings surprise, PEAD is more likely to bias the measure upward. The overall effect of drift on *NEWS_RATIO* is, thus, ambiguous, and even more so when we subsequently partition on the sign of the returns.

good-news quarters. For every firm, good-news and bad-news quarters are identified by the sign of overall quarterly return, *RET*, and characterized by the indicator variable $BNEWS_t$, which is set equal to 1 if $RET_t < 0$, and is equal to 0 otherwise. Thus, $BNEWS_t = 1$ corresponds to bad-news quarters, while $BNEWS_t = 0$ identifies good-news quarters.

We winsorize *NEWS_RATIO* at the 1st and 99th percentiles, as it includes some unrepresentative high-magnitude ratios driven by low denominators. However, the sharp difference between mean and median *NEWS_RATIO* in Table 1 for the overall sample and both subsamples implies that the variable remains right-skewed. To further address this issue, we compute the natural logarithm of the ratio, denoted *Ln*(*NEWS_RATIO*), and use this measure in our primary empirical tests. As can be seen from the proximity of mean and median *Ln*(*NEWS_RATIO*), the variable is symmetrically distributed. Finally, as an alternative to computing the natural logarithm of the ratio, we supplement our primary tests with additional regressions in which we use decile ranks of *NEWS_RATIO* (*Ranked NEWS_RATIO*) as the dependent variable.

NEWS_RATIO and *Ln*(*NEWS_RATIO*) for $BNEWS = 1$ exceeds that for $BNEWS = 0$ for all the percentiles listed in the table, except for the 95th and 99th percentiles. The median *NEWS_RATIO* is greater for bad-news quarters, but the opposite is true based on the mean ratio, a result of the variable's right-skewness.[14] Computing the natural logarithm of the ratio smoothes out the distribution, and both medians and means produce similar results; i.e., *Ln*(*NEWS_RATIO*) is greater in bad-news quarters. We conduct and discuss formal tests of significance of the difference in means and medians, as well as interpret the magnitude of *Ln*(*NEWS_RATIO*), in Section IV.

Measuring Information Asymmetry

We are primarily interested in a measure of information asymmetry that captures circumstances in which voluntary disclosures of bad news are less timely. A number of variables have been used in the literature to proxy for the information environment in various settings.

Firms with greater size and larger analyst following are expected to be characterized by less information asymmetry between managers and investors, a consequence of both market participants' greater efforts to uncover information and managers' greater willingness to be forthcoming with information (Collins et al. 1987). Further, there is evidence that institutional ownership is positively associated with firm disclosure quality (Bushee and Noe 2000). Thus, we expect that firms with higher institutional ownership are likely to have lower information asymmetry. Greater firm-level return volatility is generally reflective of greater uncertainty about a firm's operations (see, for example, Jiang et al. 2005). While this uncertainty can affect both managers and investors, it is likely to make any managerial information advantage less detectable *ex post* by external investors. Uncertainty about a firm's operations may also result in the manager requiring more time to arrive at a precise estimate of bad news. Another widely used measure of information asymmetry is the adverse selection component of the bid-ask spread (Foster and Viswanathan 1993; Brennan and Subrahmanyam 1996). It measures the extent to which the bid-ask spread quoted for the firm reflects the market makers' attempts to protect themselves against informed trading.

Instead of using the five variables separately, we use principal components analysis to extract the common variation in these variables. The five variables include: (1) logarithm of firm size, defined as market value of equity (*SIZE*), (2) logarithm of 1 plus analyst following, defined as the number of analysts covering the firm (*NUM_AN*), (3) institutional ownership, or the percentage of outstanding shares owned by institutions (*INST_OWN*), (4) idiosyncratic return volatility (*IVOL*),

[14] The relatively few instances in which managers pre-announce negative information are likely to dampen the mean *NEWS_RATIO* for bad-news quarters. This is analyzed in greater detail in Section IV.

and (5) the adverse selection component of the bid-ask spread (*Adv_BidAsk*). *IVOL* is computed as the volatility of daily firm returns in excess of market returns in the preceding quarterly period, but excluding the earnings announcement. In computing *Adv_BidAsk*, we follow Brennan and Subrahmanyam (1996), who estimate the sensitivity of price changes to order flow based on a model of price formation developed by Hasbrouck (1991). It is computed as the daily average over the last month of the preceding quarter.[15]

The principal components analysis yields a composite measure of information asymmetry between managers and shareholders, denoted *InfoAsymm*. *InfoAsymm* is negatively associated with *SIZE*, *NUM_AN*, and *INST_OWN*, and positively associated with *IVOL* and *Adv_BidAsk*. Thus, higher values of the composite measure *InfoAsymm* represent greater information asymmetry. To facilitate our cross-sectional analyses, we rank firms into deciles of *InfoAsymm* every quarter. Using the ranked variable allows us to measure earnings informativeness within each decile, and to provide a more intuitive interpretation of variation in earnings informativeness across the deciles.

Firm Characteristics: Variable Definitions and Descriptive Statistics

Table 2, Panel A, presents the key descriptive statistics for the sample, including the pooled mean, median, standard deviation, and the 5th and 95th percentiles. All continuous variables are winsorized at the 1 percent level. Additionally, we present variation in these descriptive statistics across good-news ($BNEWS_t = 0$) and bad-news quarters ($BNEWS_t = 1$) in Table 2, Panel B. For the purposes of assessing statistical significance of the differences, we use t-statistics with standard errors clustered by firm and fiscal year-quarter for the means, and Z-statistics from the Wilcoxon rank-sum tests for the medians.

RET is measured over the entire quarter (63 trading days, on average). The non-earnings-announcement period return, *NEAR*, spans, on average, a 60-day trading period, excluding the three days around the QEA date and, hence, corresponds closely to *RET*. Mean magnitudes of *RET*, *EAR*, and *NEAR* are higher than the corresponding medians in both the good-news and bad-news quarters, indicating positive skewness in the magnitudes. Both the mean and median magnitudes of earnings announcement returns, *ABS*(*EAR*), are significantly larger in bad-news quarters than in good-news quarters. The mean and median magnitudes of non-announcement returns, *ABS*(*NEAR*), on the other hand, are significantly lower during bad-news quarters than good-news quarters.

Highlighting that earnings are more likely to convey adverse information during bad-news quarters, negative three-day earnings announcement returns tend to occur significantly more frequently in quarters with negative *RET*. Mean *BAD_EAR*, an indicator variable set equal to 1 if $EAR < 0$, is 59.3 percent in bad-news quarters and 39.8 percent in good-news quarters. Mean number of trading days in the announcement quarter, denoted *TRADE_DAYS*, is between 63–64 days and significantly higher for bad-news quarters. This finding is consistent with evidence in the prior literature that documents that earnings announcements tend to be delayed when there is bad news to be conveyed (Givoly and Palmon 1982; Patell and Wolfson 1982; Chambers and Penman 1984; Cohen et al. 2007).

The bad-news subsample includes firms with significantly lower size, measured using market value of equity (*MVE*). Firms in the bad-news subsample also have significantly lower analyst following and institutional ownership, while exhibiting significantly greater idiosyncratic return volatility. *BTM* is the ratio of the book value of equity to market value of equity, and financial leverage, *LEV*, is computed as the ratio of total debt to total assets. All firm characteristics are measured at the beginning of the period. The descriptive statistics demonstrate that while *BTM* is significantly lower for firms in the bad-news subsample, leverage is similar across the two samples.

[15] Also, see Ng et al. (2009).

TABLE 2

General Descriptive Statistics

Panel A: Overall Sample

	Mean	Median	Std. Dev.	P5	P95
RET (%)	1.418	−0.450	27.725	−37.887	45.831
EAR (%)	0.185	0.034	8.396	−13.492	14.205
NEAR (%)	1.314	−0.584	26.597	−35.717	43.424
ABS(*RET*) (%)	18.345	12.516	20.836	1.081	53.676
ABS(*EAR*) (%)	5.824	3.813	6.051	0.317	18.778
ABS(*NEAR*) (%)	17.370	11.743	20.184	1.026	51.100
BAD_EAR (%)	49.728	0.000	49.999	0.000	100.000
TRADE_DAYS	63.708	63.000	11.265	44.000	84.000
MVE ($ millions)	2,284.784	373.288	6,615.455	24.602	10,765.055
NUM_AN	7.303	5.000	7.673	0.000	24.000
INST_OWN (%)	43.673	43.175	26.892	2.611	87.344
IVOL	3.293	2.746	2.154	1.107	7.303
Adv_BidAsk	3.238	1.155	8.991	−2.224	15.184
BTM (%)	53.805	44.363	47.385	7.125	133.163
LEV (%)	21.088	17.246	20.196	0.000	59.743
HITECH (%)	24.006	0.000	42.712	0.000	100.000
INSALE (%)	33.227	0.000	47.103	0.000	100.000
BIAS_ADJ	2.990	3.015	1.566	0.381	5.621
n of firm-quarters			152,275		

Panel B: Bad-News and Good-News Subsamples

	Means			Medians		
	***BNEWS* = 1**	***BNEWS* = 0**	**Difference**	***BNEWS* = 1**	***BNEWS* = 0**	**Difference**
RET (%)	−16.582	20.183	−36.765***	−12.400	12.680	−25.080***
EAR (%)	−1.671	2.120	−3.791***	−1.276	1.227	−2.503***
NEAR (%)	−14.723	18.033	−32.756***	−11.474	11.501	−22.975***
ABS(*RET*) (%)	16.582	20.183	−3.602***	12.400	12.680	−0.280***
ABS(*EAR*) (%)	6.080	5.557	0.523***	3.929	3.627	0.302***
ABS(*NEAR*) (%)	15.742	19.067	−3.325***	11.786	11.796	−0.010***
BAD_EAR (%)	59.269	39.780	19.489***	100.000	0.000	100.000***
TRADE_DAYS	64.067	63.334	0.733**	63.238	63.050	0.188***
MVE ($ millions)	2,212.590	2,360.048	−147.458*	340.806	368.978	−28.172***
NUM_AN	7.159	7.453	−0.294**	5.525	5.825	−0.300***
INST_OWN (%)	42.662	44.726	−2.064***	40.908	42.868	−1.960***
IVOL	3.446	3.134	0.313***	2.915	2.618	0.297***
Adv_BidAsk	3.281	3.193	0.088	0.915	0.876	0.039**
BTM (%)	51.824	55.869	−4.045***	43.829	45.411	−1.582***
LEV (%)	21.086	21.089	−0.002	16.567	16.637	−0.070
HITECH (%)	24.921	23.052	1.868	0.000	0.000	0.000
INSALE (%)	31.058	35.488	−4.430***	0.000	0.000	0.000
BIAS_ADJ	3.057	2.921	0.137***	3.106	2.971	0.135***
n of firm-quarters	77,723	74,552		77,723	74,552	

(continued on next page)

TABLE 2 (continued)

*, **, *** Represent statistical significance at a minimum 0.1, 0.05, and 0.01 levels, respectively.
Table 2 presents descriptive statistics. Panel A reports descriptive statistics for the full sample of 152,275 firm-quarters from 1987–2006. P5 and P95 are the 5th and 95th percentiles, respectively. Panel B reports means and medians for two subsamples: (1) firm-quarters with negative abnormal returns (*BNEWS* = 1), and (2) firm-quarters with positive abnormal returns (*BNEWS* = 0). For the purposes of assessing statistical significance of the differences, we use t-tests with standard errors clustered by firm and year-quarter for the means, and Z-statistics from the Wilcoxon rank-sum test for the medians.

Variable Definitions:
RET = quarterly market-adjusted returns beginning two days after the quarterly earnings announcement for the previous quarter and ending one day after the final earnings announcement for the current quarter;
BNEWS = an indicator variable equal to 1 if *RET* is negative, and 0 otherwise;
EAR = cumulative market-adjusted returns on trading days −1 to +1 relative to the quarterly earnings announcement;
NEAR = cumulative market-adjusted non-earnings-announcement period returns (spanning all trading days included in *RET* except for the trading days included in *EAR*);
ABS(*RET*), *ABS*(*EAR*), and *ABS*(*NEAR*) = absolute values for *RET*, *EAR*, and *NEAR*, respectively;
BAD_EAR = an indicator variable set equal to 1 if *EAR* < 0;
TRADE_DAYS = number of trading days in the announcement quarter;
MVE = beginning-of-quarter market value of equity;
NUM_AN = beginning-of-period number of analysts following the firm;
INST_OWN = beginning-of-period percentage institutional ownership;
IVOL (idiosyncratic volatility) = volatility of daily firm returns in excess of market returns in the preceding quarterly period, excluding the earnings announcements;
Adv_BidAsk = adverse selection component of the daily bid-ask spread (based on Hasbrouck [1991]) computed as the daily average over the last month of the preceding quarter;
BTM = beginning-of-period book-to-market ratio (book value of equity to market value of equity);
LEV = beginning-of-period leverage measured using ratio of total debt, both long-term and short-term, to total assets;
HITECH = binary indicator variable that is set equal to 1 if the firm belongs to any of the following four-digit SIC industry codes: 2833–2836, 3570–3577, 3600–3674, 7371–7379, or 8731–8734;
INSALE = binary indicator set equal to 1 for firm-quarters with net insider sales, and 0 otherwise. Net insider sales are measured as the sales of stock minus purchases of stock across directors and firm executives identified as officers; and
BIAS_ADJ = natural logarithm of the ratio of cumulative market-adjusted returns during a random three-day window in the quarter relative to the cumulative market-adjusted returns during that quarter outside the window.

Following Field et al. (2005), we define *HITECH* as a binary indicator variable that is set equal to 1 if the firm belongs to the following four-digit SIC industry codes, signifying technology-intensive industries: 2833–2836 (drugs and pharmaceuticals), 3570–3577 (computer and office equipment), 3600–3674 (electrical equipment and electronics), 7371–7379 (software services) or 8731–8734 (R&D services). As the mean value of *HITECH* shows, 24.9 percent of the bad-news firm-quarters and 23.1 percent of the good-news firm-quarters belong to technology-intensive industries. Finally, *INSALE* is a binary 0/1 indicator set equal to 1 if insiders have net sales of stock in a given firm-quarter. Net insider sales are measured as the stock sales minus stock purchases across directors and firm executives identified as officers.[16] Table 2, Panel B, indicates that insider sales are significantly less frequent in bad-news quarters, where their frequency is around 31.1 percent, than in good-news quarters, where their frequency is around 35.5 percent.

For every firm-quarter in our sample, we identify a random three-day window and measure the ratio of news released in that window to that released in the period within that quarter outside of the three-day window.[17] The natural logarithm of this ratio is used in our multivariate analyses to control for possible mechanical bias in our dependent variable, and is denoted *BIAS_ADJ*. This is

[16] We exclude divisional officers and officers of subsidiary companies in estimating net insider sales.
[17] The random three-day window excludes any of the three days around the QEA.

further discussed in Section IV. As Table 2, Panel B, reports, mean and median *BIAS_ADJ* are significantly higher in bad-news quarters than in good-news quarters. Table 2 demonstrates that significant differences can exist in the characteristics of firms that experience negative versus positive returns, particularly those such as size and book-to-market, which are likely associated with firm risk. To address the issue of systematic differences, we control for these firm characteristics in our regression analyses, discussed below.

IV. PRIMARY ANALYSES

Earnings Informativeness and the Sign of News

In our first empirical test of H1, we make univariate comparisons between the mean and median earnings informativeness (*Ln*(*NEWS_RATIO*)) across bad- and good-news quarters. To assess the difference in means, we use two types of t-tests with (1) standard errors clustered by firm and fiscal year-quarter, and (2) bootstrapped standard errors.[18] The difference in medians is evaluated based on the Z-statistic from the Wilcoxon rank-sum test. We report the results of these tests in Table 3, Panel A. Consistent with H1, mean and median *Ln*(*NEWS_RATIO*) are higher for bad-news quarters than for good-news quarters, with the differences being statistically significant at the 1 percent level. For both the $BNEWS = 1$ and $BNEWS = 0$ subsamples, we compute implied *NEWS_RATIO*, which is simply the exponent of the corresponding *Ln*(*NEWS_RATIO*). The implied *NEWS_RATIO* using the mean logged ratio is around 34.5 percent for bad-news quarters and 30.4 percent for good news quarters. The interpretation of this finding is that earnings are 13.5 percent more informative in bad-news quarters than in good-news quarters.

We next shift to multivariate tests. We use the following two regressions to test whether the news released during quarterly earnings announcements (QEAs) relative to that released during non-announcement (non-QEA) periods is greater when the overall returns are negative:

$$Ln(NEWS\_RATIO_t) = \alpha_0 + \beta * BNEWS_t + \alpha_1 * BIAS\_ADJ_t + \varepsilon_t. \quad (1)$$

$$\begin{aligned} Ln(NEWS\_RATIO_t) = {} & \alpha_0 + \beta * BNEWS_t + \alpha_1 * BIAS\_ADJ_t + \alpha_2 * RInfoAsymm_{t-1} + \alpha_3 * INSALE_t \\ & + \alpha_4 * TRADE\_DAYS_t + \alpha_5 * RBTM_{t-1} + \alpha_6 * RLEV_{t-1} + \alpha_7 * HITECH_{t-1} \\ & + \varepsilon_t. \end{aligned} \quad (2)$$

The intercept α_0 in Equation (1) represents the mean *Ln*(*NEWS_RATIO*) for good-news quarters after controlling for *BIAS_ADJ*. The coefficient on *BNEWS*, β, captures the extent to which the *Ln*(*NEWS_RATIO*) ratio is different for bad-news quarters as compared to good-news quarters. Our primary hypothesis (H1) predicts that the *Ln*(*NEWS_RATIO*) is higher when overall quarterly return, *RET*, is negative. In other words, we predict that β is significantly positive.

Equation (1) represents a restricted model in which we include only one control variable, *BIAS_ADJ*. It is possible that variation in *Ln*(*NEWS_RATIO*) across bad-news and good-news quarters arises at least partially from the differing variances of negative quarterly returns and positive quarterly returns.[19] However, differing variances of negative and positive returns should influence the informativeness we observe for any random three-day window within the quarter, not

[18] The bootstrapped standard errors come from re-sampling 152,275 observations 1,000 times with replacement.

[19] While the computation of *NEWS_RATIO* does not involve *RET per se*, it does involve returns during the non-QEA window in the quarter (*NEAR*). Since *NEAR* is highly associated with *RET* (correlation coefficient of 0.94), systematic differences in the variance of positive versus negative *RET* can mechanically induce systematic differences in *NEWS_RATIO* across the positive-*RET* and negative-*RET* partitions.

TABLE 3

Earnings' Differential Informativeness in Bad-News Quarters and Good-News Quarters

Panel A: Univariate Tests

	Ln(*NEWS_RATIO*)					
	***BNEWS* = 1**	***BNEWS* = 0**	**Difference**	**t-stat. with S.E. Clustered by Firm- and Year-Qtr.**	**t-stat. with Boot-strapped S.E.**	**Z-stat. from Wilcoxon Rank-Sum Test**
Mean	3.542	3.414	0.128***	3.78	3.82	
Implied Mean Ratios	34.546	30.396	4.151			
Median	3.573	3.400	0.173***			18.28
Implied Median Ratios	35.623	29.964	5.659			

Panel B: Earnings' Differential Informativeness—Multivariate Tests

		Dependent Variable			
	Predicted Sign	***Ln*(*NEWS_RATIO*) Model 1**	***Ln*(*NEWS_RATIO*) Model 2**	***Ln*(*NEWS_RATIO*) Model 3**	***Ranked NEWS_RATIO* Model 4**
Intercept		2.771***	3.326***	3.342***	3.877***
		(0.043)	(0.081)	(0.073)	(0.095)
BNEWS	+	0.097***	0.110***	0.120***	0.226***
		(0.029)	(0.028)	(0.028)	(0.046)
BIAS_ADJ		0.216***	0.214***	0.216***	0.256***
		(0.006)	(0.006)	(0.006)	(0.006)
RInfoAsymm			−0.030***	−0.039***	−0.060***
			(0.004)	(0.006)	(0.007)
INSALE			0.072***	0.031**	0.075***
			(0.017)	(0.014)	(0.021)
TRADE_DAYS			−0.006***	−0.006***	−0.005***
			(0.001)	(0.001)	(0.001)
RBTM			−0.002	−0.001	−0.006*
			(0.002)	(0.003)	(0.003)
RLEV			−0.010**	−0.001	−0.019***
			(0.002)	(0.003)	(0.003)
HITECH			0.042***		0.095***
			(0.015)		(0.028)
Firm Fixed Effects		No	No	Yes	No
S.E. Clustered by Year-Qtr		No	No	Yes	No
S.E. Clustered by Firm- and Year-Qtr		Yes	Yes	No	Yes

(continued on next page)

TABLE 3 (continued)

	Model 1	Model 2	Model 3	Model 4
n of observations	152,257	152,257	152,257	152,257
Adjusted R^2	4.78%	5.41%	7.36%	7.22%
Implied Ratios				
BNEWS = 1	17.60	17.83	17.80	
BNEWS = 0	15.97	15.98	15.78	

Panel C: Short-Horizon Forecasts and Earnings' Differential Informativeness

		Dependent Variable: *Ln*(*NEWS_RATIO*)		
		Model 1	Model 2	Model 3
	Predicted Sign for Models 1 and 3	Subsample from 1995	Subsample of Forecasters (from 1995)	Subsample of Non-Forecasters (from 1995)
Intercept		3.328***	3.017***	3.366***
		(0.092)	(0.161)	(0.090)
BNEWS	+	0.106***	−0.095*	0.144***
		(0.032)	(0.058)	(0.031)
BIAS_ADJ		0.216***	0.239***	0.211***
		(0.007)	(0.008)	(0.007)
RInfoAsymm		−0.031***	−0.035***	−0.036***
		(0.004)	(0.008)	(0.004)
INSALE		0.069***	0.064*	0.070***
		(0.014)	(0.035)	(0.015)
TRADE_DAYS		−0.006***	−0.004	−0.006***
		(0.001)	(0.003)	(0.001)
RBTM		−0.002	−0.011**	−0.001
		(0.002)	(0.005)	(0.002)
RLEV		−0.011***	−0.002	−0.012***
		(0.002)	(0.005)	(0.002)
HITECH		0.042**	0.000	0.056***
		(0.016)	(0.029)	(0.017)
S.E. Clustered by Firm- and Year-Qtr		Yes	Yes	Yes
n of observations		134,658	14,152	119,051
Adjusted R^2		5.48%	6.74%	5.49%
Implied Ratios				
BNEWS = 1		17.78	12.57	18.85
BNEWS = 0		15.99	13.83	16.32

*, **, *** Represent statistical significance at a minimum 0.1, 0.05, and 0.01 levels, respectively.

(continued on next page)

TABLE 3 (continued)

Table 3 presents univariate and multivariate tests of earnings differential informativeness. Panel A includes univariate t-tests for the differences of means and median of *Ln*(*NEWS_RATIO*) between the bad-news and the good-news quarters (*BNEWS* = 1 versus *BNEWS* = 0). t-tests are used for the comparison of the means, and the Z-statistic from the Wilcoxon rank-sum for the comparison of the medians. The first t-statistic is based on standard errors clustered by firm and fiscal year-quarter, while the second is based on bootstrapped standard errors clustered by fiscal year-quarter (obtained from drawing 152,275 observations 1,000 times with replacement). Panel B, Models 1, 2, and 4, report the results of OLS regressions with standard errors clustered by firm and fiscal year-quarter, while Panel B, Model 3, reports OLS regression results with firm fixed effects and clustering of standard errors by fiscal year-quarter. In all the regression models in Panel B (except for Model 4), we use *Ln*(*NEWS_RATIO*) as the dependent variable. In Panel B, Model 4, the dependent variable is the decile rank of *NEWS_RATIO* (*Ranked NEWS_RATIO*). Implied Ratio is the exponent of the predicted *Ln*(*NEWS_RATIO*), obtained by setting all control variables to their means except for *BIAS_ADJ*, which is set equal to 0, and *BNEWS*, equal to 1 or 0. Panel C reports the results of OLS regressions with *Ln*(*NEWS_RATIO*) as the dependent variable, and with standard errors clustered by firm and fiscal year-quarter. Panel C, Model 1, includes the sample of 134,658 firm-quarters between 1995 and 2006. Panel C, Model 2, includes the subsample of 14,152 firm-quarters between 1995 and 2006 that issue forecasts of current earnings following the previous quarter's earnings announcements, or short-horizon forecasts. Panel C, Model 3, includes the subsample of 120,506 firm-quarters between 1995 and 2006 that do not issue short-horizon forecasts. Standard errors are reported in parentheses below coefficients.
All other variables are defined in the notes to Table 2.

Variable Definitions:
Ln(*NEWS_RATIO*) = natural logarithm of *NEWS_RATIO*;
NEWS_RATIO = 100 ∗ *ABS*(*EAR*)/*ABS*(*NEAR*);
ABS(*EAR*) = absolute value of cumulative market-adjusted returns on trading days −1 to +1 relative to the QEA date;
ABS(*NEAR*) = absolute value of the cumulative market-adjusted non-earnings-announcement period returns;
BNEWS = an indicator variable equal to 1 if overall quarterly return *RET* is negative, and 0 otherwise;
RInfoAsymm = decile rank of *InfoAsymm*, which is extracted from a principal-components analysis, and is negatively associated with firm size, analyst following, and institutional ownership, and positively associated with idiosyncratic volatility and the adverse selection component of the bid-ask spread;
RBTM = decile rank of beginning-of-period book-to-market; and
RLEV = decile rank of beginning-of-period financial leverage.

just that including the QEA. Therefore, we control for *BIAS_ADJ*, which is defined as the natural logarithm of the ratio of news released during a random three-day window in the quarter relative to that released during the period in that quarter outside the window.[20]

Equation (2) expands the set of control variables to capture systematic differences in earnings informativeness arising from firm characteristics. *RInfoAsymm* is the decile rank of *InfoAsymm* within every quarter. Greater information asymmetry between managers and shareholders, and the general uncertainty typically characterizing high-information-asymmetry firms, can significantly influence earnings informativeness relative to other sources. For example, Bamber (1987) and McNichols (1988) argue that the role of earnings in conveying information varies with the information environment of the firm, which they capture empirically with firm size.

Given that managers often possess private information, their voluntary disclosures, as well as their financial reporting choices, are likely influenced by their own trading patterns (Noe 1999). Consequently, we control for the effect of *INSALE* on the informativeness of earnings. We control for *TRADE_DAYS*, since longer quarters can allow managers more time to disclose news before the actual earnings announcement and, thus, reduce earnings informativeness.

The nature of the investment opportunity set—in particular, the extent to which it is driven by growth options—can influence the information content of earnings (Collins and Kothari 1989). We

[20] Differencing *Ln*(*NEWS_RATIO*) and *BIAS_ADJ* to construct a dependent variable adjusted for bias is problematic. Each term in the difference would be a logged ratio, and differencing would yield the logarithm of a ratio of two ratios, very difficult to interpret economically.

control for the investment opportunity set using *RBTM*, the decile rank of the book-to-market ratio, and membership in a technology-intensive industry, denoted *HITECH*. Finally, additional scrutiny of earnings information by debt-holders can influence earnings informativeness; since such scrutiny is likely to be increasing in leverage, we control for *RLEV*, the decile rank of financial leverage.

Model 1 in Panel B of Table 3 reports the results of estimating Equation (1) over the entire sample of 152,275 firm-quarters. Models 2 through 4 impose controls for firm characteristics (Equation (2)). In Models 1 through 3, the dependent variable is our primary ratio, *Ln*(*NEWS_RATIO*), and in Model 4, it is the decile rank of *NEWS_RATIO*, along with a decile rank of *BIAS_ADJ* as the control. All models are estimated on the pooled sample using ordinary least squares methodology. Standard errors are clustered by firm and fiscal year-quarter in Models 1, 2, and 4. In Model 3, we include firm fixed effects and cluster standard errors by fiscal year-quarter.

In all four models presented in Table 3, Panel B, the coefficient on *BNEWS* is positive and statistically significant at the 1 percent level. To estimate the economic effect of *BNEWS*, we first compute the implied *NEWS_RATIO* for good-news quarters by setting all control variables except *BIAS_ADJ* to their mean values, and *BNEWS* equal to 0. *BIAS_ADJ* is also set equal to 0, to prevent it from inducing a mechanical bias into our estimate of earnings informativeness. This yields an implied *NEWS_RATIO* of approximately 16.0 percent for good-news quarters in Models 1, 2, and 3, indicating that in good-news quarters, news released during earnings announcements is around 16 percent of net news released during the non-announcement period. Subsequently, we follow a similar procedure to estimate the implied *NEWS_RATIO* for bad-news quarters by setting *BNEWS* equal to 1. The implied *NEWS_RATIO* indicates that in bad-news quarters, news released during earnings announcements is around 18 percent of net news released during the non-announcement period. Consistent with H1, the results further imply that during bad-news quarters, earnings informativeness is 12.0 percent higher than during good-news quarters.

We expect earnings informativeness in bad-news quarters relative to good-news quarters to be more pronounced in the sample of firms without short-horizon forecasts; that is, forecasts of current quarter's earnings issued after the previous quarter's earnings announcements. First Call's coverage on management forecasts has substantially expanded since 1995 (see Anilowski et al. 2007). Therefore, we investigate the difference between firms with and without short-horizon forecasts within the subsample of 134,658 firm-quarters between 1995 and 2006, and report the results in Table 3, Panel C. First, in Model 1, we provide the results of Equation (2) reestimated on the subsample of all firm-quarters between 1995 and 2006. Models 2 and 3 of Table 3, Panel C, include the subsamples of firm-quarters with and without forecasts, respectively, starting in 1995.

In untabulated analyses, we observe that mean (median) quarterly returns (*RET*) for firms issuing short-horizon forecasts are around −5.2 percent (−5.5 percent), while mean (median) quarterly returns for firms not issuing short-horizon forecasts are around 2.3 percent (0.02 percent). Focusing on firms experiencing bad news ($RET < 0$), mean (median) returns for bad-news firm-quarters with short-horizon forecasts are around −22.0 percent (−18.0 percent), while mean (median) quarterly returns for bad-news firm-quarters without short-horizon forecasts are around −16.3 percent (−12.2 percent).[21] Thus, the return data suggest that managers issue short-horizon

[21] All reported differences in *RET* between firms with short-horizon forecasts and those without such forecasts are statistically significant at the 1 percent level, using t-statistics with standard errors clustered by firm and year-quarter for the means and Z-statistics from the Wilcoxon rank-sum test for the medians. These results are untabulated.

forecasts in quarters in which the news reaching the market is particularly negative, and litigation risk is presumably more pronounced (Francis et al. 1994; Skinner 1997).

Model 2 presents results for 14,152 firm-quarters between 1995 and 2006 with short-horizon forecasts.[22] We find that for this subsample, earnings are *less* informative in bad-news quarters than in good-news quarters. The coefficients imply that the ratio of news disclosed during QEAs to that disclosed during non-QEA periods is 12.6 percent in bad-news quarters, as opposed to 13.8 percent in good-news quarters. The results are consistent with short-horizon forecasts preempting bad news at the earnings announcements.

For the 120,506 firm-quarters between 1995 and 2006 *without* short-horizon forecasts, Model 3 indicates strong support for H1. After imposing various controls, the coefficient on *BNEWS* in Model 3 is positive and statistically significant at the 1 percent level. The implied *NEWS_RATIO* for the average firm is 18.9 percent in bad-news quarters and 16.3 percent in good-news quarters. The difference of 2.6 percent points implies that earnings are around 16.0 percent (or 2.6/16.3) more informative during bad-news quarters relative to good-news quarters. Recall that by selection, in the sample of firms without any short-horizon forecasts, litigation risk is not high enough to warrant early public disclosure of impending bad news.

Collectively, the evidence suggests that the prospect of earnings eventually revealing withheld bad news induces managers to preemptively disclose information that is particularly negative, and is, thus, presumably associated with higher litigation risk. In the remaining majority of cases, when the magnitude of bad news is relatively low, it is earnings rather than preemptive short-horizon disclosures that reveal the bad news.[23]

Cross-Sectional Variation in Earnings' Informativeness

We test the cross-sectional variation in earnings' more pronounced role in disclosing bad news relative to good news using the following regression:

$$\begin{aligned} Ln(NEWS\_RATIO_t) = {} & \alpha_0 + \alpha_1 * BIAS\_ADJ_t + \alpha_2 * RInfoAsymm_{t-1} + \alpha_3 * INSALE_t \\ & + \alpha_4 * TRADE\_DAYS_t + \alpha_5 * RBTM_{t-1} + \alpha_6 * RLEV_{t-1} \\ & + \alpha_7 * HITECH_{t-1} + \beta_0 * BNEWS_t + \beta_1 * BIAS\_ADJ_t * BNEWS_t \\ & + \beta_2 * RInfoAsymm_{t-1} * BNEWS_t + \beta_3 * INSALE_t * BNEWS_t \\ & + \beta_4 * TRADE\_DAYS_t * BNEWS_t + \beta_5 * RBTM_{t-1} * BNEWS_t \\ & + \beta_6 * RLEV_{t-1} * BNEWS_t + \beta_7 * HITECH_{t-1} * BNEWS_t + \varepsilon_t. \end{aligned} \quad (3)$$

Equation (3) is similar to Equation (2), except that it introduces partitioning variables and allows the intercept and the coefficient on *BNEWS* to vary with the partitioning variables via the interaction terms.

[22] The proportion of firm-quarters with short-horizon forecasts in our sample is relatively low. Even after the passage of Regulation Fair Disclosure, firm-quarters with short-horizon forecasts constitute only 11 percent of our sample (20 percent value-weighted). Note that this is much lower than the proportion of firm-quarters in our sample that report negative quarterly returns (47 percent, 48 percent value-weighted) or even negative earnings announcement returns (50 percent, 47 percent value-weighted), indicating that a relatively large proportion of firms do *not* preempt bad news.

[23] In additional analysis, we further partition the sample of firms that issue short-horizon earnings forecasts into firm-quarters with management forecasts that convey negative information versus those that convey positive information. As expected, in the sample of firm-quarters with management forecasts conveying negative information, earnings' informativeness in bad-new quarters is lower than that in good-news quarters. However, there is significant evidence of earnings' greater informativeness in bad-news quarters in the sample of firm-quarters with management forecasts conveying positive information. These findings indicate that when negative information is not disclosed in voluntary disclosures, it is released by earnings.

RInfoAsymm ∗ *BNEWS* is included as an explanatory variable to test whether earnings' differential informativeness during bad news periods is higher among firm-quarters characterized by greater information asymmetry (H2). *INSALE* ∗ *BNEWS* tests whether earnings' differential informativeness is higher among firm-quarters including insider sale of stock (H3). Finding significant and positive β_2 and β_3 would, therefore, provide support for H2 and H3, respectively. We also include *TRADE_DAYS*, *RBTM*, *RLEV*, *HITECH*, and *BIAS_ADJ* independently and interacted with *BNEWS* as control variables.

Table 4, Model 1, presents results on cross-sectional variation for the full sample using our main specification. The coefficient on *RInfoAsymm* in Model 1 is significantly negative, implying that earnings informativeness in good-news quarters is declining with our measure of information asymmetry. More importantly, consistent with H2, the coefficient on *RInfoAsymm* ∗ *BNEWS* is significantly positive at the 1 percent level, indicating that earnings *differential* informativeness in bad-news quarters, relative to good-news quarters, is increasing in the degree of information asymmetry. Moreover, consistent with H3, earnings' differential informativeness in bad-news quarters, relative to good-news quarters, is higher when there is net selling of the firm's stock by insiders during the quarter (the coefficient on *INSALE* ∗ *BNEWS* is 0.133, and significant at the 1 percent level). We draw similar conclusions from Model 2 with firm fixed effects. In Model 3, we use decile ranks of *NEWS_RATIO* as the dependent variable, and replace *BIAS_ADJ* with decile ranks of the variable, as well. We note that the coefficients on both variables of interest (*RInfoAsymm* ∗ *BNEWS* and *INSALE* ∗ *BNEWS*) are of the predicted signs and statistically significant at the 1 percent level.

To evaluate the economic magnitude of earnings' differential informativeness for firms with varying levels of information asymmetry and with or without net insider sales, we compute implied ratios based on the coefficients obtained from Model 1, and present the ratios in Panel B of Table 4. We first estimate base case implied ratios, in which we set *RInfoAsymm*, *INSALE*, and *BIAS_ADJ* to 0 and all other explanatory variables to their mean values. The implied *NEWS_RATIO* for firms in the lowest rank of information asymmetry and no net insider sales is 19.7 percent in bad-news quarters, while it is 18.2 percent in good-news quarters. Thus, earnings are 1.5 percent points, or 8.6 percent, more informative in bad-news quarters than in good-news quarters for firms with low information asymmetry and no net insider sales. For firms in the highest rank of information asymmetry (but with no net insider sales), the implied *NEWS_RATIO* is 17.0 percent in bad-news quarters, and 12.3 percent in good news quarters, implying that earnings are 4.7 percent points, or 37.8 percent, more informative in bad-news quarters than in good-news quarters. Differential informativeness of earnings also increases relative to the base case for firms with net insider sales. The implied *NEWS_RATIO* for firms with net insider sales (but in the lowest rank of information asymmetry) is 22.6 percent in bad-news quarters, and 18.3 percent in good-news quarters, implying that earnings are 4.3 percent points, or 23.6 percent, more informative in bad-news quarters than in good-news quarters.

V. ADDITIONAL ANALYSES

Earnings' Differential Informativeness by Fiscal Quarter

To investigate further the role of the earnings reporting process in influencing earnings' differential informativeness, we examine how the latter varies across the four fiscal quarters. In the first three fiscal quarters, auditors only review financial reports, while in the fourth quarter, they perform a complete and thorough annual audit of statements that are subsequently submitted to the Securities and Exchange Commission (SEC). If the year-end audit is primarily responsible for the

TABLE 4

Cross-Sectional Variation in Earnings Differential Informativeness

Panel A: Regression Results

		Dependent Variable		
	Predicted Signs	***Ln*(*NEWS_RATIO*) Model 1**	***Ln*(*NEWS_RATIO*) Model 2**	***Ranked NEWS_RATIO* Model 3**
Intercept		3.459***	3.426***	4.144***
		(0.101)	(0.098)	(0.120)
BIAS_ADJ		0.235***	0.240***	0.280***
		(0.007)	(0.006)	(0.007)
RInfoAsymm		−0.043***	−0.049***	−0.085***
		(0.005)	(0.007)	(0.009)
INSALE		0.007	−0.038**	−0.044
		(0.022)	(0.018)	(0.030)
TRADE_DAYS		−0.008***	−0.007***	−0.008***
		(0.001)	(0.001)	(0.001)
RBTM		−0.002	0.002	−0.004
		(0.004)	(0.005)	(0.007)
RLEV		−0.012***	−0.001	−0.023***
		(0.003)	(0.004)	(0.005)
HITECH		0.029		0.100**
		(0.031)		(0.049)
BNEWS		−0.125	−0.086	−0.258
		(0.112)	(0.118)	(0.189)
BIAS_ADJ ∗ *BNEWS*		−0.044***	−0.044***	−0.050***
		(0.006)	(0.006)	(0.006)
RInfoAsymm ∗ *BNEWS*	+	0.027***	0.023***	0.050***
		(0.006)	(0.006)	(0.009)
INSALE ∗ *BNEWS*	+	0.133***	0.140***	0.243***
		(0.022)	(0.021)	(0.036)
TRADE_DAYS ∗ *BNEWS*		0.003*	0.002	0.006**
		(0.002)	(0.002)	(0.003)
RBTM ∗ *BNEWS*		0.002	−0.004	−0.001
		(0.005)	(0.005)	(0.009)
RLEV ∗ *BNEWS*		0.004	0.000	0.008
		(0.004)	(0.004)	(0.007)
HITECH ∗ *BNEWS*		0.026	0.030	−0.007
		(0.0449)	(0.042)	(0.072)
Firm Fixed Effects		No	Yes	No
S.E. Clustered by Year-Qtr		No	Yes	No
S.E. Clustered by Firm- and Year-Qtr		Yes	No	Yes
n of observations		152,275	152,275	152,275
Adjusted R^2		5.54%	7.64%	7.36%

(continued on next page)

TABLE 4 (continued)

Panel B: Implied Ratios

	Model 1		
	Base Case		
	***RInfoAsymm* = 0, *INSALE* = 0**	***RInfoAsymm* = 9, *INSALE* = 0**	***INSALE* = 1, *RInfoAsymm* = 0**
BNEWS = 1	19.70	17.00	22.64
BNEWS = 0	18.20	12.33	18.31

*, **, *** Represent statistical significance at a minimum 0.1, 0.05, and 0.01 levels, respectively.
Table 4, Panel A, Models 1 and 3, present the results of OLS regressions with standard errors clustered by firm and fiscal year-quarter, while Model 2 is estimated using OLS with firm fixed effects and standard errors clustered by fiscal year-quarter. The dependent variable in Models 1 and 2 is *Ln*(*NEWS_RATIO*). The dependent variable in Model 3 is the decile rank of *NEWS_RATIO* (*Ranked NEWS_RATIO*). All models include the sample of 152,275 firm-quarters between 1987 and 2006. Panel B reports Implied Ratios, computed as the exponent of the predicted *Ln*(*NEWS_RATIO*) obtained by setting all control variables to their means except for *BIAS_ADJ*, which is set equal to 0, *BNEWS*, equal to 1 or 0, and *RInfoAsymm* and *INSALE*, which are set to the values reported in the table. Standard errors are reported in parentheses below coefficients.
All other variables are defined in the notes to Tables 1 and 2.

Variable Definitions:
Ln(*NEWS_RATIO*) = natural logarithm of *NEWS_RATIO*;
NEWS_RATIO = 100 ∗ *ABS*(*EAR*)/*ABS*(*NEAR*);
ABS(*EAR*) = absolute value of cumulative market-adjusted returns on trading days −1 to +1 relative to the QEA date;
ABS(*NEAR*) = absolute value of the cumulative market-adjusted non-earnings-announcement period returns; and
BNEWS = an indicator variable equal to 1 if overall quarterly return *RET* is negative, and 0 otherwise.

release of bad news in earnings, then earnings' differential informativeness should be concentrated in the fourth fiscal quarter.

Table 5 presents the results of estimating earnings' differential informativeness with respect to bad news by fiscal quarter. The coefficient on *BNEWS* is statistically insignificant in the first and second fiscal quarters, and significant at the 5 percent or higher level in the third and fourth fiscal quarters. In magnitude, the coefficient on *BNEWS* at first increases across quarters, reaching its peak in the third fiscal quarter, and then exhibits a slight decline. The coefficients imply that earnings are only around 5.6 percent more informative about bad news in the first fiscal quarter, and that this effect increases to 10.5 percent in the second fiscal quarter; the corresponding percentages are around 15.1 percent for the third fiscal quarter and 13.3 percent for the fourth. Interestingly, earnings informativeness with respect to both good and bad news exhibits a lower magnitude in the fourth fiscal quarter than in the third.

One interpretation of the results is that as the year-end audit approaches, managers release more bad news via the earnings reporting process, causing the observed rise in earnings' differential informativeness over the first three fiscal quarters. However, in the fourth quarter, the imminent release of audited annual results can generate intensified scrutiny of the firm by market participants, even prior to the earnings announcements, prompting managers to provide more voluntary disclosures (Baginski and Hassell 1990). This is possibly responsible for the diminished informativeness of earnings in the fourth quarter, with respect to both bad and good news.

TABLE 5

Earnings' Differential Informativeness by Fiscal Quarter

	Predicted Sign	Dependent Variable: *Ln*(*NEWS_RATIO*)			
		Quarter 1	**Quarter 2**	**Quarter 3**	**Quarter 4**
Intercept		3.622***	3.104***	3.403***	2.855***
		(0.103)	(0.111)	(0.147)	(0.173)
BNEWS	+	0.055	0.100	0.141***	0.125**
		(0.057)	(0.065)	(0.039)	(0.057)
BIAS_ADJ		0.188***	0.213***	0.202***	0.249***
		(0.009)	(0.008)	(0.010)	(0.013)
RInfoAsymm		−0.031***	−0.032***	−0.030***	−0.035***
		(0.005)	(0.008)	(0.007)	(0.007)
INSALE		0.053	0.085***	0.083***	0.075*
		(0.034)	(0.026)	(0.030)	(0.039)
TRADE_DAYS		−0.010***	−0.003**	−0.007***	−0.001
		(0.001)	(0.001)	(0.002)	(0.001)
RBTM		0.000	−0.003	0.002	−0.003
		(0.003)	(0.004)	(0.002)	(0.004)
RLEV		−0.012***	−0.006**	−0.010***	−0.013***
		(0.004)	(0.003)	(0.003)	(0.003)
HITECH		0.083***	0.034	0.039*	0.030
		(0.031)	(0.023)	(0.023)	(0.0291)
S.E. Clustered by Firm- and Year-Qtr		Yes	Yes	Yes	Yes
n of observations		35,529	38,020	38,633	40,093
Adjusted R^2		4.14%	5.10%	4.74%	6.97%
Implied Ratios					
BNEWS = 1		20.18	17.83	19.46	14.70
BNEWS = 0		19.11	16.13	16.90	12.97

*, **, *** Represent statistical significance at a minimum 0.1, 0.05, and 0.01 levels, respectively.
Table 5 presents the results from OLS regressions estimated separately for fiscal Quarters 1–4. Standard errors are clustered by firm and fiscal year-quarter. The dependent variable is *Ln*(*NEWS_RATIO*). Implied Ratio is the exponent of the predicted *Ln*(*NEWS_RATIO*), obtained by setting all control variables to their means except for *BIAS_ADJ*, which is set equal to 0, and *BNEWS*, equal to 1 or 0. Standard errors are reported in parentheses below coefficients.
All other variables are defined in the notes to Tables 1 and 2.

Variable Definitions:
Ln(*NEWS_RATIO*) = natural logarithm of *NEWS_RATIO*;
NEWS_RATIO = 100 ∗ *ABS*(*EAR*)/*ABS*(*NEAR*);
ABS(*EAR*) = absolute value of cumulative market-adjusted returns on trading days −1 to +1 relative to the QEA date;
ABS(*NEAR*) = absolute value of the cumulative market-adjusted non-earnings-announcement period returns; and
BNEWS = an indicator variable equal to 1 if overall quarterly return *RET* is negative, and 0 otherwise.

Earnings Misses

In expanded cross-sectional analyses, we test whether earnings' differential informativeness during bad-news quarters can indeed be attributed to negative information conveyed *directly* by earnings information. The primary example of earnings conveying negative information is when realized earnings fall short of prevailing expectations at the time of the earnings announcement. We

define an indicator variable, *MISS*, set equal to 1 when actual earnings fall below earnings expectations. Earnings expectations are based on consensus analyst forecasts if analyst data are available; otherwise, they are based on a seasonal random walk.[24] Our results (untabulated) reveal that earnings' differential informativeness is significantly more pronounced in quarters when earnings fall below market expectations. The finding confirms that negative earnings surprises contribute to the increased informativeness of earnings that we observe in bad-news quarters using our returns-based measure.

Subperiod Analysis

There were two significant regulatory events during our sample period that are likely to have influenced both voluntary disclosure and financial reporting practices: Regulation Fair Disclosure (REG FD), effective since the fourth calendar quarter of 2000, and the Sarbanes Oxley Act (SOX), effective since the third calendar quarter of 2002.[25] In this section, we examine earnings informativeness in three subperiods: (1) before REG FD, (2) after REG FD, but before SOX, and (3) after SOX. The passage of REG FD and SOX was associated with a period of significant turmoil in the capital markets, particularly with the reporting scandals involving audit firms such as Arthur Andersen and a large number of U.S. corporations such as WorldCom, Enron, Qualcomm, etc. These confounding events imply that any observed change in earnings informativeness cannot be exclusively attributed to REG FD and/or SOX, and in that sense, our evidence is descriptive. Nevertheless, it is instructive to learn how earnings informativeness varied across this turbulent period, within which the passage of REG FD and SOX represent two clearly identifiable watershed events.

Table 6 reports the results of subperiod analyses testing for changes in the differential informativeness of earnings announcements with respect to bad news versus good news with the passage of REG FD and SOX. Consequently, we examine three subperiods in our sample. Model 1 of Table 6 includes the first subperiod: all fiscal quarters which, in calendar time, precede the fourth quarter of 2000 (PRE-REG-FD). Model 2 includes the second subperiod: all fiscal quarters which, in calendar time, correspond to or follow the fourth quarter of 2000, and precede the third quarter of 2002 (POST-REG-FD PRE-SOX). Model 3 includes the third subperiod: all remaining fiscal quarters which, in calendar time, correspond to, or follow, the third quarter of 2002 (POST-SOX). We find that the coefficient on *BNEWS* is not statistically significant in the PRE-REG-FD period, but positive and significant at the 1 percent level in the more recent POST-REG-FD and POST-SOX periods.

As reported in Panel B in Table 6, the implied *NEWS_RATIO* in the PRE-REG-FD subperiod for a firm with average values of the control variables is 15.2 percent in bad-news quarters, and 14.8 percent in good-news quarters; this small difference is not statistically significant at conventional levels. Interestingly, in the second subperiod, the implied *NEWS_RATIO* for bad-news quarters rises to 19.3 percent, while for good-news quarters, it decreases marginally to 13.2 percent. The increase in the implied *NEWS_RATIO* from the previous subperiod is significant at the 5 percent level for bad-news quarters. The results suggest that the changes in the information environment

[24] The consensus analyst forecast is the mean across the final forecast provided by each analyst in a given announcement quarter. Using the median consensus analyst forecast yields similar results.

[25] Gintschel and Markov (2004) and Mohanram and Sunder (2006) conclude that REG FD largely succeeded in its objective of restricting selective voluntary disclosure. Further, Wang (2007) and Chen et al. (2011) document evidence suggesting that REG FD adversely affected the informativeness of voluntary disclosures. With respect to SOX, Cohen et al. (2007) document evidence consistent with firms having less flexibility in reporting earnings-increasing discretionary accruals in the post-SOX period.

TABLE 6

Subperiod Analysis of Earnings Differential Informativeness

Panel A: Regression Results

		Dependent Variable: *Ln*(*NEWS_RATIO*)		
	Predicted Sign	**Model 1 PRE-REG-FD Period**	**Model 2 POST-REG-FD PRE-SOX Period**	**Model 3 POST-SOX Period**
Intercept		3.250***	3.077***	3.709***
		(0.052)	(0.103)	(0.103)
BNEWS	+	0.022	0.377***	0.148***
		(0.029)	(0.047)	(0.030)
BIAS_ADJ		0.229***	0.219***	0.186***
		(0.007)	(0.014)	(0.007)
RInfoAsymm		−0.016***	−0.026***	−0.057***
		(0.002)	(0.007)	(0.005)
INSALE		0.007	−0.022	0.081***
		(0.019)	(0.021)	(0.018)
TRADE_DAYS		−0.007***	−0.005***	−0.007***
		(0.001)	(0.001)	(0.001)
RBTM		−0.001	−0.014***	0.001
		(0.002)	(0.004)	(0.002)
RLEV		−0.006***	−0.004	−0.020***
		(0.002)	(0.003)	(0.003)
HITECH		0.045***	−0.004	0.020
		(0.020)	(0.043)	(0.020)
S.E. Clustered by Firm- and Year-Qtr		Yes	Yes	Yes
n of observations		79,007	23,264	50,004
Adjusted R^2		5.79%	7.05%	5.29%

Panel B: Implied Ratios

	Model 1 PRE-REG-FD Period	**Model 2 POST-REG-FD PRE-SOX Period**	**Difference from PRE-REG-FD Period**	**Model 3 POST-SOX Period**	**Difference from POST-REG-FD PRE-SOX Period**
BNEWS = 1	15.17	19.28	4.11**	22.94	3.66**
BNEWS = 0	14.84	13.22	−1.62	19.79	6.56***

, * Represent statistical significance at a minimum 0.05 and 0.01 levels, respectively.

Table 6, Panel A, presents the results of OLS regressions with standard errors clustered by firm and fiscal year-quarter. The dependent variable is *Ln*(*NEWS_RATIO*). Model 1 includes all fiscal quarters which, in calendar time, precede the enactment of Regulation FD in the fourth quarter of 2000 (PRE-REG-FD). Model 2 includes all fiscal quarters which, in calendar time, correspond to, or follow, the fourth quarter of 2000, and precede the enactment of the Sarbanes-Oxley Act in the third quarter of 2002 (POST-REG-FD PRE-SOX). Model 3 includes all remaining fiscal quarters which, in calendar time, correspond to, or follow, the third quarter of 2002 (POST-SOX). Standard errors are reported in parentheses below coefficients. Panel B presents Implied Ratios, which are computed as the exponent of the predicted *Ln*(*NEWS_RATIO*) obtained by setting all control variables to their means except for *BIAS_ADJ*, which is set equal to 0, and *BNEWS*, equal to 1 or 0.

(continued on next page)

TABLE 6 (continued)

All other variables are defined in the notes to Tables 1 and 2.

Variable Definitions:
Ln(*NEWS_RATIO*) = natural logarithm of *NEWS_RATIO*;
NEWS_RATIO = 100 * *ABS*(*EAR*)/*ABS*(*NEAR*);
ABS(*EAR*) = absolute value of cumulative market-adjusted returns on trading days −1 to +1 relative to the QEA date;
ABS(*NEAR*) = absolute value of the cumulative market-adjusted non-earnings-announcement period returns; and
BNEWS = an indicator variable equal to 1 if *RET* is negative, and 0 otherwise.

around the passage of REG FD made earnings' role in conveying bad news more pronounced POST-REG FD.

Finally, Model 3 indicates that in the POST-SOX subperiod, the implied *NEWS_RATIO* for bad-news quarters is 22.9 percent, significantly higher than in the previous subperiod. The implied *NEWS_RATIO* for good-news quarters increases more sharply to 19.8 percent (relative to 13.2 percent in the second subperiod); this increase is statistically significant at the 1 percent level. The evidence suggests that SOX, along with the events surrounding its passage, enhanced the role of earnings in conveying both good and bad news, but that this effect was stronger with respect to good news.[26] The net effect is a decline in earnings' differential informativeness in bad-news quarters relative to good-news quarters in the POST-SOX period. Importantly, however, the differential informativeness of earnings remains significant in the POST-SOX period.

Management Forecasts Issued along with QEAs

In robustness analyses, we identify those firm-quarters in which QEAs are accompanied by management forecasts of earnings. For these observations, it is not possible to distinguish the part of the information released during the three-day QEA window that is attributable to the current quarter's earnings information from that attributable to the accompanying voluntary disclosure. Consequently, we reestimate our regressions after excluding these observations. The excluded observations constitute around 14.0 percent of the overall sample, and become increasingly prevalent with time. They constitute only 2.6 percent of the sample PRE-REG-FD, around 20.4 percent of the sample in the POST-REG-FD PRE-SOX subperiod, and around 29.0 percent of the sample in the POST-SOX subperiod. Our results on the primary hypothesis and cross-sectional variation are robust to the exclusion of observations in which QEAs are accompanied by management forecasts. Moreover, the general time-series patterns observed in Table 6 are robust to the exclusion, as well. Implied *NEWS_RATIO*s for the restricted sample during bad-news and good-news quarters are, respectively, 14.2 percent and 14.4 percent in the PRE-REG-FD subperiod, 17.8 percent and 12.5 percent in the POST-REG-FD PRE-SOX subperiod, and 20.3 percent and 17.1 percent in the POST-SOX subperiod.

VI. CONCLUSION

The collective evidence in our paper suggests that earnings play a valuable information role by mitigating delays in bad-news disclosures in the large majority of cases when litigation risk is not high enough to warrant preemptive voluntary disclosures. Using returns-based measures to capture

[26] Consistent with our findings, Ball and Shivakumar (2008) also note the general increase in QEA informativeness with time (particularly post-SOX), although they do not condition on the sign of overall news.

news, we find that the ratio of news released during the three days around the QEA date to that released during the non-QEA period is significantly greater when quarterly returns are negative, relative to when they are positive. As expected, our evidence is concentrated among firms that do not issue short-horizon forecasts.

Our cross-sectional tests provide evidence that earnings increased informativeness during bad-news quarters is even greater in firms characterized by higher information asymmetry between managers and shareholders, and in firm-quarters with net insider sales of stock. We also analyze whether earnings' differential informativeness varies by fiscal quarter and in time-series. We find that earnings' differential informativeness is concentrated in the third and the fourth fiscal quarters. Subperiod analysis indicates that earnings' informativeness in bad-news quarters, relative to good-news quarters, becomes more pronounced in the later part of our sample period, particularly after the passage of Regulation Fair Disclosure, and persists in the post-SOX period.

Our paper contributes to the existing literature by providing evidence that earnings information plays a crucial role in limiting delays in the release of bad news to the market. Direct evidence on the news earnings convey is particularly critical at this point in time, as the Financial Accounting Standards Board (FASB) considers new standards, presumably for the purpose of making earnings more informative (Johnson 2005; FASB 2007; Kothari et al. 2010). Our findings indicate that the standard-setters, in drafting the new standards, need to bear in mind that earnings' value as an information source may lie in the *ex post* settling-up role that they play with respect to negative information. In certain cases, as when litigation risk is high, the prospect of releasing negative news at the earnings announcements can prompt managers to disclose such news voluntarily in a timely manner. When factors such as litigation risk are not high enough to induce voluntary disclosures, and managers' incentives to delay bad news disclosures are more pronounced, earnings release the negative information that has not reached the market via alternative sources.

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APPENDIX A

NEWS_RATIO MAGNITUDES UNDER VARIOUS SCENARIOS

	***EAR*, *NEAR* of the Same Sign**		***EAR*, *NEAR* of Different Sign**	
	***EAR* < 0** ***NEAR* < 0**	***EAR* > 0** ***NEAR* > 0**	***EAR* > 0** ***NEAR* < 0**	***EAR* < 0** ***NEAR* > 0**
RET < 0				
Consistency with H1	Could be consistent or inconsistent	Not possible	Inconsistent	Consistent
Magnitude of *NEWS_RATIO*	High if consistent, Low if not	Not possible	Low	High
RET ≥ 0				
Consistency with H1	Not possible	Could be consistent or inconsistent	Inconsistent	Consistent
Magnitude of *NEWS_RATIO*	Not possible	Low if consistent, High if not	High	Low

This appendix tabulates the scenarios under which *NEWS_RATIO* is expected to be relatively high versus relatively low. *NEWS_RATIO* is defined as 100 * *ABS(EAR)*/*ABS(NEAR)*. *EAR* is the cumulative market-adjusted returns on trading days −1 to +1 relative to the quarterly earnings announcement (QEA) date, *NEAR* represents the cumulative market-adjusted non-QEA period

returns (spanning all trading days included in *RET* except for the trading days included in *EAR*). *ABS*(*EAR*) and *ABS*(*NEAR*) represent absolute values for *EAR* and *NEAR*, respectively. *RET* represents quarterly market-adjusted returns beginning two days after the QEA date for the previous quarter and ending one day after the QEA date for the current quarter.

To establish the patterns in *NEWS_RATIO*, first consider cases when *EAR* and *NEAR* are of the same sign. If it is true that earnings play a proportionately greater role in releasing bad news than good news, as our hypothesis states, then for cases when $RET < 0$, *ABS*(*EAR*) is expected to be high relative to *ABS*(*NEAR*). Similarly, when $RET > 0$, our hypothesis would imply that *ABS*(*EAR*) is expected to be low relative to *ABS*(*NEAR*).

Next, consider the scenarios with differing signs on *EAR* and *NEAR*, beginning with the case when $RET < 0$, $EAR < 0$, and $NEAR > 0$. This case is clearly consistent with our hypothesis: all of the negative information is released at the *QEA*s. Since overall returns are negative, by construction, *EAR* will be higher than *NEAR* in magnitude and *NEWS_RATIO* will be high. The scenario where $RET < 0$, $EAR > 0$, and $NEAR < 0$ is inconsistent with our hypothesis: all of the negative information is released during the non-QEA period. *EAR*, by construction, must be lower in magnitude than *NEAR*, since overall returns are negative, generating a low *NEWS_RATIO*. Thus, *NEWS_RATIO* functions well as an empirical proxy by assuming high values for negative-return observations, consistent with our hypothesis, and lower values for those that are inconsistent.

To generate the asymmetry predicted by our hypothesis, *NEWS_RATIO* also needs to assume lower values for all positive-*RET* observations that are consistent with our hypothesis, and higher values for those that are inconsistent. We examine the positive-*RET* cases with *EAR* and *NEAR* of differing signs to ensure that this is true. First, we focus on $RET > 0$, $EAR < 0$, and $NEAR > 0$. This case is consistent with our hypothesis: all of the positive information for the period reaches the market during the *non-QEA* period. Since overall returns are positive, by construction, *EAR* will be lower than *NEAR* in magnitude, and *NEWS_RATIO* will be low. Finally, in the positive-return case that is inconsistent with our hypothesis ($RET > 0$, $EAR > 0$, and $NEAR < 0$), *EAR*, by construction, has to be higher in magnitude than *NEAR*, since overall returns are positive, generating a higher *NEWS_RATIO*. In summary, variation in *NEWS_RATIO* is well suited to testing whether the relative informativeness of earnings is higher when overall information reaching the market is negative.