The Information Content of SEC Filings and Information Environment: A Variance Decomposition Analysis

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ABSTRACT: Using the Vuolteenaho (2002) variance decomposition methodology, this study assesses the relative value relevance of cash flow, accrual, and expected return news on SEC and preliminary earnings filing dates, as measured by their contribution to the volatility of unexpected returns. Cash flow news is found to be more value-relevant than accrual news. Although expected return (risk) news is the least value-relevant, it is significantly correlated with changes in betas and returns at the preliminary and SEC filing dates, indicating association with changes in firm risk and discount rates. This study also documents that these informational components contain less (more) value-relevant information at the SEC filing date for firms with a higher proportion of long-term (short-term) sophisticated investors after controlling for other dimensions of the information environment.

Keywords: SEC filings; value relevance; variance decomposition.

I. INTRODUCTION

A number of papers have examined the value relevance of SEC filings for firms that provide preliminary earnings. Although most early studies tend to find little if any value relevance on SEC filing dates, possibly because of sample size limitations and the difficulty in pinpointing the timing of SEC information prior to EDGAR, more

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recent studies conclude that SEC filings are in fact value-relevant beyond preliminary earnings.\(^1\) The twofold purpose of this study is to assess the relative value relevance of specific informational components on SEC filing (and preliminary earnings) dates and to investigate the extent to which these components are affected by the firm’s information environment. Three informational components are of particular interest: news about the firm’s risk as reflected in expected future returns (discount rates), news about the firm’s accruals, and news about the firm’s cash flows.

In contrast to prior studies, value relevance of a news component in this study is measured by its contribution to the volatility of unexpected equity returns. Information that is value-relevant necessarily causes market participants to revise expectations regarding discount rates (expected return news) and/or future cash flows (earnings news), thereby driving the volatility of current period returns.\(^2\) This study initially focuses on the extent to which the volatility of unexpected equity returns around the SEC filing date is related to news concerning these two factors. We next decompose earnings news into accrual and cash flow news components to determine which of expected return (risk), accruals, or cash flow news most affect the volatility of unexpected equity returns around the SEC filing date. This decomposition is of special interest since accrual/cash flow news components are usually unknown at the time of the preliminary earnings announcement, and revealed for the first time in the SEC filings, in contrast to earnings and expected return (risk) news that are partially revealed at the preliminary earnings announcement.\(^3\)

We assess the relative value relevance of the informational components at the SEC filing date (and at the preliminary date) using the variance decomposition methodology of Campbell (1991), Vuolteenaho (2002), and Callen and Segal (2004). The primary usefulness of these models is that they allow discount rates to change over time and, therefore, yield an estimable measure of the informational impact of SEC filings on shocks to firm risk as reflected in revisions to expected future discount rates. This is important because as Campbell et al. (1997, 265), among others, show, small changes in expected discount rates can have a large impact on security returns, especially when expected returns are persistent.\(^4\) Of almost equal importance is that these models yield news estimates that are comprehensive. For example, earnings news in this study is measured as the impact of informational shocks on current period expected earnings (the earnings surprise) and on all expected future earnings over the lifetime of the firm. So for example, if the information in the SEC filing affects expectations of both current and future years’ earnings, then earnings news

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\(^2\) Studies that have emphasized the volatility of unexpected equity returns as a valuation metric include Campbell (1991), Vuolteenaho (2002), Callen and Segal (2004), and Callen et al. (2005). See also Campbell et al. (1997) and Cochrane (2001).

\(^3\) A few firms provide cash flow and/or accruals information in their preliminary earnings release. We control for the level of information on the preliminary earnings release date in the empirical tests below.

\(^4\) We show below that expected return news is positively correlated with changes in firm risk and discount rates as measured by market betas and ex post returns.
will be the (discounted) sum of the current year earnings surprise and the change in expectations of future period’s earnings.⁵

The second major (interrelated) focus of this study concerns the relation between the informational components of unexpected equity return volatility on SEC filing dates and the informational environment of the firm, with a special focus on the degree of information asymmetry between the firm and its investors. It has been argued that disclosure regulation is motivated by regulators’ desire to reduce the information gap between the firm and its investors and between informed and uninformed investors (Healy and Palepu 2001). If so, then a positive relation between the valuation relevance of SEC filings and the degree of information asymmetry should obtain. We measure information asymmetry in part by the degree of investor sophistication after controlling for other dimensions of the information environment, assuming that sophisticated investors are more knowledgeable than unsophisticated investors about the firm prior to SEC filings. An immediate consequence of this assumption is that sophisticated investors are less likely to revise their future earnings estimates based on the SEC filings as compared to less sophisticated investors, so that the contributions of expected return (risk), accrual, and cash flow news to the variance of unexpected returns on SEC filing dates should be negatively associated with the degree of investor sophistication.

We further break down sophisticated investors into two classes, investors with short-term investment horizons and investors with long-term investment horizons, following Bushee (1998, 2001). Not all sophisticated investors are likely to be equally motivated to collect information between the preliminary earnings announcement and the filing date. In particular, we expect the negative association between the variance contributions of expected return (risk) news, accrual news, and cash flow news on SEC filing dates and the degree of investor sophistication to hold primarily for sophisticated investors with long-term investment goals. No such relationship is expected for short-term (“transient”) sophisticated investors, such as momentum traders, who have little incentive to collect additional firm-level information. On the contrary, momentum traders are more likely to view excess volatility in a positive light, since the extant empirical evidence suggests that institutional momentum traders invest primarily in smaller riskier firms (Bennett et al. 2000; Badrinath and Wahal 2002).

We find that the variance contribution of the expected return (risk) news component and the earnings news component are statistically significantly different from zero both at the preliminary earnings release date and the SEC filing date. These news items are also significantly negatively correlated. Despite the fact that earnings news is more economically significant than expected return (risk) news in driving unexpected return volatility at both the preliminary and SEC filing dates, nevertheless, expected return (risk) news is shown to be significantly associated with changes in betas and changes in ex post returns at the preliminary and SEC filing dates. Therefore, expected return news measures changes in firm risk and signals the direction of change in the firm’s cost of capital at both the preliminary announcement and SEC filing dates.

⁵ Recent papers recognize the importance of controlling for the impact of current shocks on future earnings by controlling for persistence in the analysis. Yet, the earnings news definition and the VAR matrix in our analysis incorporates, by construction, the persistence of returns, the persistence of earnings (accruals/cash flows), and their interactions. We also do not have to control for firm growth, or interactions between firm growth and the various persistence measures because firm growth is incorporated in our VAR matrix (through the book-to-market ratio). For a proof of these claims in a simple environment, see Callen et al. (2005, Appendix A). For more general results, see Callen (2004).
We also document that the variance contribution of expected return (risk) news, accruals news, and cash flow news around the SEC filing date are statistically significantly different from zero, indicating that the significant variance contribution of earnings news on the SEC filing date may be attributed (at least in part) to the information conveyed by the accruals-cash flow breakdown. We also find that cash flow news is statistically and economically more significant than accrual news in driving volatility of returns. This finding contrasts with Callen and Segal (2004) who find that accruals and cash flows are equally important in driving unexpected annual returns.

This study further documents a negative association between the variance contribution of cash flow news and accruals news (but not expected return news) on the SEC filing date and the degree of investor sophistication as measured by aggregate institutional ownership. Further disaggregating sophisticated investors into long-term (dedicated and quasi-indexer) investors and short-term (transient) investors, reveals that expected return (risk) news, cash flow news, and accruals news on the SEC filing date are negatively correlated with the degree of investor sophistication for long-term investors. In contrast, we find a significantly positive association between the variance contribution of expected return (risk) and cash flows news components on the SEC filing date and the degree of investor sophistication for "transient" investors with short-term horizons.

In what follows, Section II develops the research hypotheses. Section III describes the variance decomposition model used to estimate earnings, accrual, and cash flow news. Section IV discusses the data and sample selection. Section V presents the empirical results and Section VI concludes.

II. HYPOTHESES DEVELOPMENT

Volatility Reactions to Preliminary Earnings Announcements and SEC Filing Dates

Prior research shows that investors respond to earnings surprises included in preliminary earnings announcements and that this information is incorporated fairly quickly into equity prices (Lev 1989; Kothari 2001). The accounting literature also shows that markets respond to SEC filings (Foster and Vickrey 1978; Wilson 1986, 1987; Qi et al. 2000; Griffin 2003; Balsam et al. 2002). In contrast to the prior literature, this study measures value relevance in terms of the volatility of unexpected equity returns. Of particular interest is the decomposition of volatility into informational components on the preliminary earnings announcement and SEC filing dates. Initially, two components are of interest, namely, earnings news and expected return (risk) news as formalized in the following two hypotheses, stated in the alternative:

**H1:** The contributions of expected return (risk) news and earnings news to the volatility of unexpected equity returns are significantly different from zero on the preliminary earnings announcement date.

**H2:** The contributions of expected return (risk) news and earnings news to the volatility of unexpected equity returns are significantly different from zero on the SEC filing date.

Expected Return (Risk), Operating Cash Flow, and Accruals News

When a company releases preliminary earnings prior to the SEC filing, the earnings news will be impounded in price. Therefore, one should not observe earnings news on the SEC filing date, unless the filed earnings are materially different from preliminary earnings or unless the information contained in the financial report causes investors to interpret the
earnings number differently. One possible reason for the reinterpretation of the earnings number is the additional information conveyed by the breakdown of earnings into cash flows and accruals.

The literature on cash flows and accruals indicates that both components of earnings are generally value-relevant (Rayburn 1986; Wilson 1986, 1987; Bowen et al. 1987; Bernard and Stober 1989; Livnat and Zarowin 1990; Dechow 1994; Sloan 1996; Subramanyam 1996; Pfeiffer and Elgers 1999; Barth et al. 1999; Xie 2001; Callen and Segal 2004). Which of the two earnings components is more value-relevant remains unclear (Sloan 1999). Particularly germane to our study are the papers by Wilson (1986, 1987) and Callen and Segal (2004). Wilson (1986) examines market reactions to new information about cash flows from operations (or funds from operations) and accruals around the filing of the ARS or Form 10-K with the SEC. He finds significant market reactions to cash flows and accruals together for a small sample of manufacturing firms. He also finds that accruals are value-relevant beyond cash flows. Wilson (1986) does not evaluate the impact of the accruals-cash flow breakdown on the volatility of unexpected equity returns nor does he measure changes in firm risk. Callen and Segal (2004) employ the variance decomposition methodology to examine the variance contribution of expected return (risk), accruals, and cash flows news on the volatility of unexpected annual returns. They find that accruals and cash flow news are far more value-relevant than expected return (risk) news. They also find some evidence that accrual news is more value-relevant than cash flow news. However, they do not investigate the return decomposition of expected return (risk), accruals, and net operating cash flow news over the short window around the SEC filing date, when this information initially becomes available to investors.

This discussion leads to our third hypothesis (stated in the alternative):

**H3:** The contributions of expected return (risk), accruals, and cash flows news to the volatility of unexpected equity returns on the SEC filing date are significantly different from zero.

**Earnings News and Investor Sophistication**

The greater the degree of information asymmetry between the firm and its investors, the more likely are preliminary earnings and SEC filings to be informative to the equity markets. Recent work by Balsam et al. (2002) and Griffin (2003) point to a negative relation between the information content of the financial statements on SEC filing dates and investor sophistication. This suggests that the informational components of the volatility of unexpected equity returns at the SEC filing date are a decreasing function of investor sophistication, after controlling for other dimensions of the information environment. This is expressed formally in our next hypothesis (stated in the alternative):

**H4:** The variance contributions of expected return (risk) news, cash flow news, and accrual news on the SEC filing dates are decreasing with the level of investor sophistication.

Bushee (1998, 2001) classifies institutions into three groups—“transient,” “dedicated,” and “quasi-indexers”—based on factors such as portfolio turnover, diversification, and momentum trading. “Transient” institutions are characterized as having high portfolio turnover and highly diversified portfolio holdings. These are short-term focused investors whose investments are based on the likelihood of short-term trading profits and have little incentive to gather information relevant to long-run value. In contrast, “dedicated” investors and
“quasi-indexers” both provide long-term, stable ownership to firms. Dedicated institutional investors hold large stakes in a limited number of firms, whereas quasi-indexers generally follow indexing and buy-and-hold strategies, characterized by high diversification. Such ownership structures create incentives to invest in monitoring management and to obtain information beyond current earnings to assess managers’ performance.\textsuperscript{6} In addition, Porter (1992) argues that long-term investors have better access to private information about their portfolio firms. Thus, greater proportions of “dedicated” investors and “quasi-indexers” are associated with lower information asymmetry. Given the divergence in investor objectives and information needs, our final hypothesis (stated in the alternative) examines whether the level of ownership by different institutional investors has implications for the variance contributions of the news components.

\textbf{H5}: The variance contributions of expected return (risk) news, cash flow news, and accruals news on the SEC filing dates are decreasing (not decreasing) with the level of investment by long-term (short-term) institutional investors.

\section*{III. NEWS, VARIANCE DECOMPOSITION, AND RESEARCH DESIGN}
This section briefly describes the Vuolteenaho (2002) and Callen and Segal (2004) valuation models and the variance decomposition methodology. The method for estimating the news components is relegated to an Appendix.

\textbf{The Models}

Based on the Clean Surplus relation, Vuolteenaho (2002) shows that a security’s unexpected returns can be expressed as:\textsuperscript{7}

\begin{equation}
    r_t - E_{t-1}(r_t) = \Delta E_t \sum_{j=0}^{\infty} p^j (roe_{t+j} - i_{t+j}) = \Delta E_t \sum_{j=1}^{\infty} p^j r_{t+j}
\end{equation}

where:

\begin{itemize}
    \item \(\Delta\) = the first differencing operator;
    \item \(E_t\) = the expectations operator and \(\Delta E_t = E_t(\cdot) - E_{t-1}(\cdot)\);
    \item \(r_t\) = log equity return (cum dividend) in excess of the risk-free rate in period \(t\);
    \item \(\rho\) = a constant error approximation term;
    \item \(roe_t\) = log book return on equity in period \(t = \log (1 + X_t/BV_{t-1})\);
    \item \(BV_t\) = book value of equity at time \(t\);
    \item \(X_t\) = net income in period \(t\); and
    \item \(i_t\) = log of 1 plus the risk-free rate in period \(t\).
\end{itemize}

Equation (1) shows that the shock to returns \((r_t - E_{t-1}(r_t))\) depends not only on the shock to current period (log deflated) expected earnings—the conventional earnings surprise \(\Delta E_t(roe_t)\)—but also on the shock to future expected earnings \(\Delta E_t \sum_{j=1}^{\infty} p^{j}(roe_{t+j})\). Defining

\textsuperscript{6} Although quasi-indexers follow a passive investment strategy, Monks and Minow (1995) argue that these investors have strong incentives to monitor management to ensure that it is acting in the best interest of the firm.

\textsuperscript{7} Small case letters denote the logs of the capitalized variables. For simplicity, we abstract from any additive error approximation terms when describing the models.

\textit{The Accounting Review, October 2006}
the unexpected stock return components as expected-return (risk) news (\(N_r\)) and earnings news (\(N_e\)), Equation (1) can be expressed as:

\[
r_t - E_{t-1}(r_t) = N_e - N_r
\]

where:

\[
N_r = \Delta E_t \sum_{j=1}^{\infty} \rho^j r_{t+j} = \text{Expected Return News; and}
\]

\[
N_e = \Delta E_t \sum_{j=0}^{\infty} \rho^j (r_{t+j} - i_{t+j}) = \text{Earnings News.}
\]

Equation (2) shows that the unexpected change in current stock returns increases with earnings news and decreases with expected return news. An unexpected positive change in earnings news conveys positive information about the firm’s prospects and, hence, translates into higher returns. Conversely, an unexpected increase in future expected returns (costs of capital), due to increased risk, translates into negative unexpected current returns.

Taking variances of both sides of Equation (2) yields the variance decomposition of unexpected stock returns:

\[
\text{Var}[r_t - E_{t-1}(r_t)] = \text{var}(N_r) + \text{var}(N_e) - 2\text{cov}(N_r, N_e).
\]

Equation (5) can be used to assess the impact of earnings news and expected-return (risk) news on equity returns. The greater is the variance of any factor on the right-hand side of the equation, the more impact that factor has in explaining the volatility of unexpected returns.

The impact of cash flow news and accrual news can be determined in similar fashion. Following Callen and Segal (2004), the log return on book equity in Equation (1) can be broken down into cash flow and accrual components yielding:

\[
r_t - E_{t-1}(r_t) = \Delta E_t \sum_{j=0}^{\infty} \rho^j (CF_{t+j} - i_{t+j}) + \Delta E_t \sum_{j=0}^{\infty} \rho^j ACC_{t+j} - \Delta E_t \sum_{j=1}^{\infty} \rho^j r_{t+j}
\]

where \(CF_i\) denotes cash flow from operations normalized by prior period book value and \(ACC_i\) denotes accruals normalized by prior period book value. Equation (6) can be expressed more succinctly as:

\[
r_t - E_{t-1}(r_t) = nCF_t + nACC_t - N_r
\]

where:

\[
nCF_t = \Delta E_t \sum_{j=0}^{\infty} \rho^j (CF_{t+j} - i_{t+j}) \text{ Cash Flow News; and}
\]

\[
nACC_t = \Delta E_t \sum_{j=0}^{\infty} \rho^j ACC_{t+j} = \text{Accrual News.}
\]

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8 It is immaterial whether \(i_t\) is subtracted from cash flows or accruals in Equation (6).
Equation (7) can be used to provide a variance decomposition of the unexpected change in returns based on the cash flow-accrual breakdown. Specifically, taking variances of both sides of this equation yields:

\[ \text{var}[r_t - E_{t-1}(r_t)] = \text{var}(Nr_t) + \text{var}(nCF_t) + \text{var}(nACC_t) - 2\text{cov}(Nr_t, nCF_t) - 2\text{cov}(Nr_t, nACC_t) + 2\text{cov}(nCF_t, nACC_t). \]  

(10)

**The VAR**

The return variance decomposition (Equation (5)) cannot be computed without estimates (of the dynamics) of expected returns and expected earnings. Following Campbell (1991), Campbell and Ammer (1993), Vuolteenaho (2002), Callen (2004), Callen and Segal (2004), and Callen et al. (2005), we estimate earnings and expected returns news using a log-linear vector autoregressive (VAR) model. In general, VAR estimation is facilitated by assuming that the dynamics of the data are well described by a (stationary) multivariate time-series model. Specifically, define \( z_{it} \) to be a vector of firm-specific state variables that follows the vector autoregressive process:

\[ z_{it} = A z_{i,t-1} + \eta_{it}. \]  

(11)

Consistent with the literature, the VAR coefficient matrix \( A \) is assumed to be constant over time and over firms. The error term vectors \( \eta_{it} \) are zero-mean vectors of shocks and are assumed to have a variance-covariance matrix \( \Omega \) and to be independent of all variables known at \( t-1 \).

We initially estimate a parsimonious VAR where the state variables consist of log stock returns, log book return on equity, and the log book-to-market ratio.\(^9\) The VAR model can then be described as a system of (mean-adjusted) equations:

\[ r_t = \alpha_1 r_{t-1} + \alpha_2 \text{roe}_{t-1} + \alpha_3 \text{bm}_{t-1} + \eta_{1t}; \]  

(12a)

\[ \text{roe}_t = \beta_1 r_{t-1} + \beta_2 \text{roe}_{t-1} + \beta_3 \text{bm}_{t-1} + \eta_{2t}; \]  

(12b)

\[ \text{bm}_t = \delta_1 r_{t-1} + \delta_2 \text{roe}_{t-1} + \delta_3 \text{bm}_{t-1} + \eta_{3t}. \]  

(12c)

We estimate the regressions separately using panel data with firm and fiscal quarter fixed effects. Consistent robust standard errors are obtained using the Shao and Rao (1993) jackknife method where the clustering variable is the calendar year fiscal quarter.

**IV. DATA AND SAMPLE**

**The Preliminary and Unrestated Compustat Quarterly Data**

Data entry into the Compustat databases has been performed in a fairly structured manner over the years. When a firm releases its preliminary earnings announcement, Compustat takes as many line items as possible from the preliminary announcement and enters them into the quarterly database within two to three days of the announcement. The preliminary data in the database are denoted by an update code of 2, until the firm files its Form 10-Q (10-K) with the SEC or releases it to the public, at which point Compustat updates all available information and uses an update code of 3. In subsequent periods,

\(^9\) As in Vuolteenaho (2002) the book-to-market ratio is included in the parsimonious VAR because our model is generated from this ratio. It also controls for the firm’s growth prospects.
Compustat updates the information further if the firm restates its quarterly financial statements for any reason. Most restatements are due to mergers and acquisitions or divestitures.

Charter Oak Investment Systems, Inc. (Charter Oak) has routinely collected the weekly original CD-ROMs that Compustat sends to its PC clients, which contain updated data as of that week. From these weekly updates, Charter Oak constructs a database that contains, for each firm in the Compustat Quarterly database, three numbers for each Compustat line item in each quarter. The first number is the preliminary earnings announcement that Compustat inserts into the database bearing the update code of 2. The second number is the “As First Reported” (AFR) figure when Compustat first changes the update code to 3 for that firm-quarter. The third number is the number that exists in the current version of Compustat, which is what most investors and academics use. The Charter Oak database allows us to determine the information contained in the preliminary earnings announcement and the first-reported information in the SEC filing. Therefore, the Charter Oak database is superior to Compustat because the Charter Oak earnings number is what investors see and react to on the SEC filing date, untainted by restatements. Also, and unlike Compustat, the Charter Oak database provides data that allow us to control for those firms that disclose more than just earnings on the preliminary earnings announcement date.\footnote{We repeated the analysis using Compustat and obtained similar results.}

**Sample Selection**

The initial population for this study consists of all firm-quarters in the Quarterly Compustat database between the first quarter of 1988 (the first quarter after the adoption of SFAS No. 95, which mandated the disclosure of net operating cash flows) and the most recent quarter available at the time of the study (the fourth quarter of 2003). The only limitation that we impose on the initial selection of firm-quarters is to require that firm market values at quarter-end be in excess of $1 million, yielding an initial population of 348,275 firm quarters. From this initial population, we delete observations with missing CUSIP identifier or missing preliminary earnings release dates. In addition, observations are deleted if the preliminary income before extraordinary items and discontinued operations (DATA 8) is missing. We also delete observations with missing quarterly net operating cash flow in the SEC filing (DATA 108), missing total assets at the end of the prior quarter (DATA 44), and missing or negative book value of equity at the end of the prior quarter (DATA 60). These restrictions reduce the sample size to 325,525 firm-quarters.

For each firm-quarter in the reduced sample, we obtain the SEC filing date, which is supplied to us by Compustat for the calendar years 1991–2003. For each firm-quarter, we compute the cumulative return during the three-day window centered on the preliminary earnings announcement date and on the SEC filing date, as long as the two dates are in excess of seven days apart. The requirements of SEC filing dates (which are at least seven days after the preliminary announcement) and availability of returns around the preliminary earnings and SEC filing dates reduce the sample size further to 122,911 firm-quarter observations.

In addition, for each firm-quarter we compute the return on equity (ROE) on the preliminary (filing) date as preliminary (filing) income before extraordinary items and discontinued operations scaled by book value of equity at the end of the previous quarter. The book-to-market ratio (BM) is computed as book value of equity at the end of the previous quarter scaled by the contemporaneous market value of equity. Accruals are computed as income before extraordinary items and discontinued operations minus net operating cash flow.
To facilitate the estimation of the VAR earnings model on the preliminary earnings release date and the SEC filing date, as well as the VAR cash flow-accruals model on the SEC filing date, we require that each firm-quarter have both a valid current and lagged observation, where the lag refers to the same fiscal quarter in the previous fiscal year, for the following variables: cumulative returns, ROE and BM around the preliminary and filing date, and accruals and net operating cash flows around the filing date. These restrictions reduce the sample size to 85,254 firm-quarters. In addition, to mitigate the effect of outliers, we eliminate the top and bottom one percentile of each of the VAR system variables (current and lag), thereby reducing the sample size to 72,533 firm-quarters. Finally, we eliminate observations for which income at the preliminary date is materially different from the reported income in the 10-Q/-K because of their potential effect on earnings news at the filing date due to new information. Specifically, we drop observations for which the absolute value of the difference between income before extraordinary items at the filing date and preliminary date is greater than 1 percent of the absolute value of income before extraordinary items at the preliminary date, yielding a final sample of 70,606 firm-quarters.\footnote{Inclusion of these observations in the analyses has no material impact on the reported results. A separate variance decomposition analysis for the sample of observations for which income at the preliminary date is materially different from the reported income in the 10-Q/-K shows a higher variance contribution of expected return news on the SEC filing date than that of firms with no earnings revisions between the preliminary earnings release and the SEC filing. These findings suggest that those firms that report a different earnings number in the SEC filing than in the preliminary earnings release experience an increase in risk as reflected by expected return news.}

**Sample Summary Data**

Most firms disclose their preliminary earnings for the quarter or the year through a press release, followed by an SEC filing several weeks later. Easton and Zmijewski (1993) report a median lag between the fiscal quarter-end and the preliminary earnings announcement date (SEC filing date) of 28 (45) days. Our sample shows (untabulated) a similar pattern with median lags between the fiscal quarter-end and the preliminary earnings and SEC filing dates of 22 and 45 days, respectively.

Table 1 provides descriptive statistics of the main variables used in the analyses. The sample firms are large, with a mean (median) market value of equity of $2.8 ($0.3) billion. The table also reveals considerable variation and skewness in firm size. The sample firms have mean (median) quarterly return on equity of 2.1 percent (2.9 percent) and book-to-market ratio of 0.6 (0.5). The mean (median) accruals scaled by book value is $-2.9$ percent ($-2.3$ percent), and the mean and median net operating cash flows scaled by book value are 5.0 percent and 4.8 percent, respectively. The mean (median) three-day cumulative raw equity market return centered on the preliminary earnings release date of 0.8 percent (0.4 percent) is significantly larger than the three-day cumulative return centered on the 10-Q/-K filing date of 0.3 percent (0.1 percent). On average, about 29 percent of sample firms provide some balance sheet data at the preliminary earnings announcement but only about 8 percent provide cash flow data.

**V. EMPIRICAL RESULTS**

**Variance Decomposition and Informational Components**

The parameter estimates for the preliminary VAR earnings model are shown in Panel A of Table 2. The first number is the estimated coefficient based on firm and fiscal quarter fixed-effects panel data techniques. The second number in parentheses is a robust Shao and Rao (1993) jackknife standard error. All parameter estimates are significant at less than the...
### TABLE 1
Descriptive Statistics

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<th>Mean</th>
<th>Std</th>
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<th>Median</th>
<th>Q3</th>
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<td>0.000</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>ANN</td>
<td>0.279</td>
<td>0.448</td>
<td>0.000</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>ACC_PROP</td>
<td>0.031</td>
<td>0.023</td>
<td>0.017</td>
<td>0.025</td>
<td>0.038</td>
</tr>
<tr>
<td>PREBS</td>
<td>0.287</td>
<td>0.452</td>
<td>0.000</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>PREOCF</td>
<td>0.077</td>
<td>0.267</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>LOSS</td>
<td>3.032</td>
<td>4.296</td>
<td>0.000</td>
<td>1.000</td>
<td>4.000</td>
</tr>
<tr>
<td>INS_HOL</td>
<td>0.471</td>
<td>0.239</td>
<td>0.282</td>
<td>0.482</td>
<td>0.662</td>
</tr>
<tr>
<td>DED_HOL</td>
<td>0.113</td>
<td>0.100</td>
<td>0.031</td>
<td>0.094</td>
<td>0.169</td>
</tr>
<tr>
<td>TRA_HOL</td>
<td>0.132</td>
<td>0.126</td>
<td>0.033</td>
<td>0.094</td>
<td>0.197</td>
</tr>
<tr>
<td>QIX_HOL</td>
<td>0.219</td>
<td>0.136</td>
<td>0.107</td>
<td>0.208</td>
<td>0.313</td>
</tr>
</tbody>
</table>

This table provides descriptive statistics on the main variables used in the analysis for our sample of 70,606 firm-quarters.

The institutional ownership statistics are based on a sample of 55,653 observations.

- **MV** = market value of equity in millions of dollars at quarter-end;
- **$R_p$** and **$R_f$** = the three-day cumulative raw returns centered on the preliminary earnings release date and on the 10-Q/K filing date, respectively;
- **BM** = book value of equity at previous quarter-end divided by market value of equity at quarter-end;
- **ROE** = return on equity, computed as the quarterly net income before extraordinary items divided by book value of equity at the previous quarter-end;
- **CF_B** = quarterly cash flows from operations scaled by book value of equity at the previous quarter-end;
- **AC_B** = accruals, computed as net income before extraordinary items minus quarterly cash flows from operations, scaled by book value of equity at the previous quarter-end;
- **EDGAR (FD)** = dummy variable that equals 1 after 1995 (2000), and 0 otherwise;
- **ANN** = dummy variable that equals 1 if a 10-K, and 0 otherwise;
- **ACC_PROP** = the absolute value of the ratio of total accruals to average total assets in the prior eight quarters;
- **PREOCF (PREBS)** = dummy variable that equals 1 if the company provided operating cash flows (balance sheet items on receivables, payables, and inventories) at the preliminary earning release date, and 0 otherwise;
- **LOSS** = the number of loss quarters during the most recent 20 quarters;
- **INS_HOL** = institutional ownership;
- **DED_HOL** = the proportion of shares held by "dedicated" institutional investors; and
- **QIX_HOL (TRA_HOL)** = proportion of shares held by "quasi-indexer" ("transient") institutional investors.

1 percent significance level. The return variable ($r_i$) is the three-day cumulative log equity return centered on the preliminary earnings announcement date. The return equation shows that current returns are negatively associated with past returns and past preliminary earnings (measured as the log of 1 plus the return on lagged book equity) and positively associated with past (log) book-to-market ratios. Thus, all three lagged variables Granger-cause returns.
Table 2
Estimated Parameters of the VAR Models

Panel A: Preliminary Earnings Model

VAR Coefficient Matrix: Preliminary Earnings

<table>
<thead>
<tr>
<th></th>
<th>(r_{t-1})</th>
<th>(roe_{t-1})</th>
<th>(bm_{t-1})</th>
<th>Adj R(^2)</th>
<th>F-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(r_i)</td>
<td>-0.041***</td>
<td>-0.053***</td>
<td>0.004***</td>
<td>0.003</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>(0.006)</td>
<td>(0.009)</td>
<td>(0.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(roe_i)</td>
<td>0.028***</td>
<td>0.205***</td>
<td>-0.006***</td>
<td>0.232</td>
<td>556</td>
</tr>
<tr>
<td></td>
<td>(0.004)</td>
<td>(0.016)</td>
<td>(0.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(bm_i)</td>
<td>-0.543***</td>
<td>-0.609***</td>
<td>0.395***</td>
<td>0.606</td>
<td>2471</td>
</tr>
<tr>
<td></td>
<td>(0.043)</td>
<td>(0.083)</td>
<td>(0.025)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Variance Decomposition: Preliminary Earnings

<table>
<thead>
<tr>
<th></th>
<th>(VARNP)</th>
<th>(VARNEP)</th>
<th>(COVRPE)</th>
<th>(VARRP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\text{VAR})</td>
<td>0.000022***</td>
<td>0.0004076***</td>
<td>-0.000146***</td>
<td>0.004391***</td>
</tr>
<tr>
<td></td>
<td>(0.000001)</td>
<td>(0.000128)</td>
<td>(0.000005)</td>
<td>(0.000138)</td>
</tr>
</tbody>
</table>

Panel B: Filing Date Earnings Model

VAR Coefficient Matrix: Filing Date Earnings

<table>
<thead>
<tr>
<th></th>
<th>(r_{t-1})</th>
<th>(roe_{t-1})</th>
<th>(bm_{t-1})</th>
<th>Adj R(^2)</th>
<th>F-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(r_i)</td>
<td>-0.042***</td>
<td>-0.014**</td>
<td>0.001</td>
<td>0.000</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>(0.008)</td>
<td>(0.006)</td>
<td>(0.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(roe_i)</td>
<td>0.010*</td>
<td>0.209***</td>
<td>-0.006***</td>
<td>0.234</td>
<td>538</td>
</tr>
<tr>
<td></td>
<td>(0.006)</td>
<td>(0.016)</td>
<td>(0.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(bm_i)</td>
<td>-0.340***</td>
<td>-0.688***</td>
<td>0.389***</td>
<td>0.601</td>
<td>2352</td>
</tr>
<tr>
<td></td>
<td>(0.078)</td>
<td>(0.086)</td>
<td>(0.025)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Variance Decomposition: Filing Date Earnings

<table>
<thead>
<tr>
<th></th>
<th>(VARNRF)</th>
<th>(VARNEF)</th>
<th>(COVRFE)</th>
<th>(VARRF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\text{VAR})</td>
<td>0.000004***</td>
<td>0.001617***</td>
<td>-0.000065***</td>
<td>0.001751***</td>
</tr>
<tr>
<td></td>
<td>(0.000000)</td>
<td>(0.000055)</td>
<td>(0.000002)</td>
<td>(0.000060)</td>
</tr>
</tbody>
</table>

Panel C: Cash Flow-Accrual Model

VAR Coefficient Matrix: Cash Flow-Accrual

<table>
<thead>
<tr>
<th></th>
<th>(r_{t-1})</th>
<th>(CF_{t-1})</th>
<th>(ACC_{t-1})</th>
<th>(bm_{t-1})</th>
<th>Adj R(^2)</th>
<th>F-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(r_i)</td>
<td>-0.041***</td>
<td>-0.015**</td>
<td>-0.015**</td>
<td>0.001</td>
<td>0.000</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>(0.008)</td>
<td>(0.006)</td>
<td>(0.001)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(CF_i)</td>
<td>-0.004</td>
<td>0.358***</td>
<td>0.038***</td>
<td>0.0001</td>
<td>0.271</td>
<td>1595</td>
</tr>
<tr>
<td></td>
<td>(0.008)</td>
<td>(0.017)</td>
<td>(0.014)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(ACC_i)</td>
<td>0.005</td>
<td>-0.111***</td>
<td>0.167***</td>
<td>-0.006***</td>
<td>0.166</td>
<td>1227</td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td>(0.014)</td>
<td>(0.013)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(bm_i)</td>
<td>-0.337***</td>
<td>-0.869***</td>
<td>-0.705***</td>
<td>0.386***</td>
<td>0.601</td>
<td>2046</td>
</tr>
<tr>
<td></td>
<td>(0.078)</td>
<td>(0.091)</td>
<td>(0.098)</td>
<td>(0.024)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(continued on next page)
### TABLE 2 (Continued)

**Variance Decomposition: Cash Flow-Accrual**

<table>
<thead>
<tr>
<th></th>
<th>$\text{VARNRF}$</th>
<th>$\text{VARNCF}$</th>
<th>$\text{VARNAC}$</th>
<th>$\text{COVRFCF}$</th>
<th>$\text{COVRFAC}$</th>
<th>$\text{COVCFAC}$</th>
<th>$\text{VARRF}$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.0000004***</td>
<td>0.011695***</td>
<td>0.007449***</td>
<td>-0.000058***</td>
<td>-0.000008***</td>
<td>-0.0007636***</td>
<td>0.004007***</td>
</tr>
<tr>
<td></td>
<td>(0.0000000)</td>
<td>(0.000224)</td>
<td>(0.000151)</td>
<td>(0.000001)</td>
<td>(0.000002)</td>
<td>(0.000170)</td>
<td>(0.000111)</td>
</tr>
</tbody>
</table>

* ***** indicate significance levels of 10 percent, 5 percent, and 1 percent, respectively.

Panel A lists the parameter estimates for the preliminary earnings VAR model. The model variables include $r_t$, the three-day cumulative return centered on the preliminary earnings release date (the first element of the state vector $z$); log of 1 plus income before extraordinary items scaled by initial period book value of equity, $ro$, (the second element); and the log book-to-market ratio, $bm$, (the third element). The parameters in the table correspond to the system:

$$ z_{t+1} = A z_t + \eta_t, \text{ and } \Omega = E(\eta_t', \eta_t). $$

Two numbers are reported for each parameter. The first number is the panel data firm and fiscal quarter fixed effect point estimate of the parameter. The second number in parentheses is a robust jackknife standard error.

Panel A also provides the means of the variance decomposition for the preliminary earnings model where the variances are defined as follows:

1. $\text{VARRF} = \text{Total variance of mean-adjusted returns at preliminary earnings release date} = \text{VARNRF} + \text{VARNEF} - 2*\text{COVRFE}.$
2. $\text{VARNCF} = \text{variance of expected-return news at the preliminary earnings release date}.$
3. $\text{VARNAC} = \text{variance of earnings news at the preliminary earnings release date}.$
4. $\text{COVRFCF} = \text{the covariance of expected-return news with cash flows news}.$

The standard errors (in parentheses) of the variances are computed using the Shao and Rao (1993) jackknife method; the clustering variable is year-quarter.

Panel B lists the parameter estimates for the filing date earnings VAR model. The model is the same as for Panel A except that $r_t$ is the cumulative three-day return centered on the 10-Q/K filing date. Panel B also shows the variance decomposition for the SEC filing date earnings model where the variances are defined as follows:

1. $\text{VARRF} = \text{Total variance of mean-adjusted returns at the 10-Q/K filing date} = \text{VARNRF} + \text{VARNEF} - 2*\text{COVRFE}.$
2. $\text{VARNCF} = \text{variance of expected-return news at the 10-Q/K filing date}.$
3. $\text{VARNAC} = \text{variance of earnings news at the 10-Q/K filing date}.$
4. $\text{COVRFCF} = \text{the covariance of expected-return news with cash flows news}.$

Panel C lists the parameter estimates for the cash flow-accrual VAR model. The model variables include $r_t$, the three-day cumulative return centered on the 10-Q/K filing date (the first element of the state vector $z$); cash flow from operations scaled by beginning of period book value of equity, $CF_t$ (the second element); accruals scaled by beginning of period book value of equity, $ACC_t$ (the third element); and the log book-to-market ratio, $bm$, (the fourth element). In addition, Panel C presents the variance decomposition for the cash flow-accrual model where the variances are defined as follows:

1. $\text{VARRF} = \text{Total variance of mean-adjusted returns at the 10-Q/K filing date} = \text{VARNRF} + \text{VARNCF} + \text{VARNAC} - 2*\text{COVRFCF} - 2*\text{COVRFAC} + 2*\text{COVCFAC}.$

All variables are computed at the 10-Q/K filing date.

2. $\text{VARNCF} = \text{variance of cash flow news}.$
3. $\text{VARNAC} = \text{variance of accrual news}.$
4. $\text{COVRFCF} = \text{the covariance of expected-return news with cash flows news}.$
5. $\text{COVRFAC} = \text{the covariance of expected-return news with accruals news}.$
6. $\text{COVCFAC} = \text{the covariance of cash flows news with accruals news}.$

The preliminary earnings variable is positively associated with past returns and past preliminary earnings and negatively associated with the past book-to-market ratio. The book-to-market ratio is negatively related to past returns and past preliminary earnings and positively related to the past book-to-market ratio.
Panel A of Table 2 also shows the variance decomposition of unexpected equity returns at the preliminary earnings release date. The standard errors (in parentheses) of the variances are computed using the Shao and Rao (1993) jackknife method based on year-quarters. The variances and the covariance are statistically significant at less than the 1 percent level. The variance contribution of expected return (risk) news (VARNRP) is 0.002 percent and the variance contribution of preliminary earnings news (VARNEP) is 0.41 percent. The covariance between expected return (risk) and earnings news is −0.015 percent indicating that the information contained in expected return (risk) news is negatively correlated with the information contained in earnings news. The total return variance (VARRP) computed as in Equation (5) is 0.5 percent.\textsuperscript{12} To assess the relative significance of VARNRP and VARNEP, one compares the volatility (square root of the tabulated variance) of earnings and expected return (risk) news, 0.06 and 0.005, respectively, with the mean log of (1 plus) absolute cumulative returns around the preliminary earnings date of 0.05.\textsuperscript{13}

These results indicate that (preliminary) earnings news drives the volatility of contemporaneous unexpected equity returns more than does expected return (risk) news. Nevertheless, the statistically significant variance (and covariance) contribution of expected return (risk) news suggests that it is important to control for risk changes in the analysis. Overall, these findings are consistent with the ubiquitous evidence that the market responds to earnings surprises at preliminary earnings announcements. Furthermore, these findings indicate that the market responds to expected return (risk) news at preliminary earnings announcements.

Panel B of Table 2 shows the parameter estimates of the VAR earnings model around the SEC filing date, which are similar to the estimates around the preliminary earnings announcement. Panel B also presents the variance decomposition on the SEC filing date. The results are similar to the variance decomposition on the preliminary earnings announcement date, although the magnitudes of the variances and the covariance are smaller. More specifically, the variances and covariance are statistically significant at less than the 1 percent level. The variance contribution of expected return news (VARNRF) is 0.0004 percent and the variance contribution of earnings news (VARNEF) is 0.16 percent.\textsuperscript{14} These results also indicate that earnings news at the filing date drives the volatility of contemporaneous unexpected equity returns more than does expected return (risk) news on the SEC filing date. Again, the covariance between earnings news and expected return news is significant and negative (−0.0007 percent). Overall, these findings imply that SEC filings convey value-relevant information about shocks to future earnings and about shocks to future firm risk (as mirrored through changes to expected discount rates).

By itself, the earnings number on the SEC filing date cannot convey additional information beyond the preliminary earnings number unless the market interprets the earnings number in conjunction with additional information included in the SEC filing. To explore the possibility that the significant variance contribution of earnings news on the SEC filing date may be attributed to unexpected cash flows or accruals, we follow Callen and Segal (2004) and estimate a VAR model where net income is separated into accruals and net

\textsuperscript{12} Note that the variance of earnings news can exceed or equal the variance of total return news whenever the covariance between expected return news and earnings news is negative.

\textsuperscript{13} See Equation (1). By this calculation, expected return (risk) news is slightly more than 8 percent (.005/.06) of earnings news. Note that the returns and ROE in the VAR system are log-transformed.

\textsuperscript{14} The square root of earnings news and discount rate news are 0.04 and 0.002, respectively, comparable to the log of (1 plus) absolute cumulative returns around the filing date of 0.03. Hence, discount rate news is 5 percent of earnings news.
operating cash flows, and investigate whether the variance contributions of these two components of earnings are significantly different from zero. As with the estimation of earnings news on the SEC filing date, the return variable is the three-day cumulative log equity return centered on the SEC filing date.

Panel C of Table 2 provides parameter estimates of the cash flow-accrual VAR model around the SEC filing date. We find that current returns are negatively and significantly associated with past returns, past cash flows and past accruals. The cash flow equation indicates that cash flows are significantly and positively associated with past cash flows and past accruals. The accruals equation shows that accruals are significantly and negatively associated with past cash flows and past book-to-market ratios and positively associated with past accruals. Finally, the current book-to-market ratio is significantly and negatively (positively) associated with past returns, cash flows, and accruals (past book-to-market ratio).

Panel C of Table 2 shows the variance decomposition of accruals and net operating cash flows on the SEC filing date. All variances and covariances are significant at less than the 1 percent level. The variance contribution of cash flows (1.16 percent) is significantly greater than the variance contribution of accruals news (0.75 percent), suggesting that cash flow news is more value-relevant than accruals news. The expected return (risk) news variance is significantly smaller in magnitude (0.0004 percent), indicating that accrual and cash flow news are the main drivers of equity returns, rather than expected future discount rates. Thus, Panel C strongly implies that the contribution of earnings to the volatility of unexpected equity returns on the SEC filing date is due at least in part to the additional information conveyed by the accruals-cash flow breakdown.

As a sensitivity analysis, we estimate the variance decomposition around non-event (non-filing) periods. Specifically, we estimate the variance contribution of earnings in the three-day window \([-3, -1]\) where day 0 is either the preliminary earnings announcement date or the SEC filing date. Our results show that the variance contribution is significantly greater during the window \([-1, +1]\) than during the window \([-3, -1]\) for both the preliminary earnings announcement and the SEC filing dates. Thus, our methodology picks out the increase in variance contribution due to the additional firm disclosure.

In an additional sensitivity analysis, we examine the effect of clustering on the results. The evidence in Griffin (2003) and our data indicate that a large proportion of firms file financial statements on the due date—45 (90) days after fiscal quarter (year) end—or on the prior day. Clustering potentially affects information flows. On the one extreme, clustering could effectively reduce the multifirm information source to that of a single firm or, on the other extreme, the cross-sectional dependencies could produce a more informative message for all firms due to information transfer from one firm to another.

To examine whether the results are affected by clustering, we conduct two analyses. First, we estimate the mean and median variance contributions separately (1) for firms that file financial statements either on the day prior to the due date or on the due date and (2) for all other firms. Untabulated results show that the variance contributions are all significant and of similar magnitudes for both groups. Second, we compute for each calendar day the proportion of companies that filed the financial statements for the fiscal quarter. We then

---

Interestingly, the variance contribution of accruals \(VARMAC\) and cash flows \(VARNCF\) are much larger than the variance contribution of earnings on the SEC filing date (Panel B, Table 2). Part of the difference is certainly attributable to the high correlation between accruals and cash flows news \(COVCFAC = -0.76\%\). Nevertheless, one cannot compare directly the variances of accruals and cash flows with the variance of earnings because they are obtained from different models.
compute the mean and median variance contributions separately for calendar days with proportion of filers greater than 5 percent and for all other days. Again, the results indicate that clustering has little impact on the variance contributions.

**Expected Return News, Risk, and Discount Rates**

This study maintains that expected return news is a measure of change to firm risk and to firm discount rates. Table 3 tests this maintained assumption formally by regressing changes in beta and changes in *ex post* returns on expected return news. Since expected return news and earnings news are correlated, we also control for earnings news in the regressions. Panel A of Table 3 provides summary statistics of the betas and average daily returns for various time periods. These betas and average daily returns are best described by the schema below. Let $F$ denote the filing date and $P$ the preliminary earnings announcement date. The focus is the change in beta and the average daily return arising out of the preliminary announcement ($P_i$) and the SEC filing ($F_i$) in the current quarter $t$. $\beta_{t-1}(R_{t-1})$ denotes the beta (average daily return) from the filing date of the prior quarter to the preliminary date of the current quarter. $\beta_t(R_t)$ denotes the beta (average daily return) from the preliminary announcement date of the current quarter to the filing date of the current quarter. $\beta_{t+1}(R_{t+1})$ denotes the beta (average daily return) from the filing date of the current quarter to the preliminary date of the next quarter. $[\beta_{t+1} + \beta_t] (R_{t+1} + R_t)$ denotes the beta (average daily return) from the preliminary announcement date of the current quarter to the preliminary announcement date of the next quarter. $[\beta_{t+1} + \beta_{t-1}] (R_{t+1} + R_{t-1})$ denotes the beta (average daily return) from the filing date of the prior quarter to the filing date of the current quarter.

<table>
<thead>
<tr>
<th>Prior Quarter</th>
<th>Current Quarter</th>
<th>Next Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\beta_{t-1}(R_{t-1})$</td>
<td>$\beta_t(R_t)$</td>
<td>$\beta_{t+1}(R_{t+1})$</td>
</tr>
<tr>
<td>$F_{t-1}$</td>
<td>$P_t$</td>
<td>$F_t$</td>
</tr>
</tbody>
</table>

Panel A of Table 3 shows that the betas are relatively stable. The mean (median) of the betas is around 0.69 (0.61). The standard deviation of $\beta_i$ is much higher than the standard deviation of the betas of the other periods, most probably because there are fewer days between the preliminary announcement and the SEC filing in period $i$ with which to estimate beta as compared to the other periods. In fact, the median number of trading days available to estimate $\beta_i$ is 13, suggesting that the estimates of $\beta_i$ are not statistically reliable. The mean (median) average daily returns are from 0.02 to .06 (.01 to .04) depending on the time period. By comparison to the betas, average daily returns are highly volatile, relative to the mean.

Table 3. Panel B shows regressions of changes in various betas on expected return (risk) news and earnings news. We first focus on the current quarter preliminary announcement ($P_i$). The first column of Table 3, Panel B shows that the change in beta from

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16 All betas are computed after eliminating the three-day period around the event date, be it the preliminary earnings announcement or the SEC filing dates.

17 Although the correct focus of the analysis is on changes in returns, we also find that expected return news is positively correlated with returns after the preliminary announcement and after SEC filing dates. The latter results are consistent with a changes specification if the expected returns in the base periods are cross-sectionally constant.
TABLE 3
Analysis of Changes in Beta, Changes in Returns, and Expected Return News

Panel A: Summary Statistics of the Betas and Averaged Daily Returns

<table>
<thead>
<tr>
<th></th>
<th>( n )</th>
<th>( \text{Mean} )</th>
<th>( \text{Std} )</th>
<th>( \text{Q1} )</th>
<th>( \text{Median} )</th>
<th>( \text{Q3} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \beta_{-1} )</td>
<td>52,707</td>
<td>0.697</td>
<td>0.756</td>
<td>0.218</td>
<td>0.608</td>
<td>1.082</td>
</tr>
<tr>
<td>( \beta )</td>
<td>56,016</td>
<td>0.665</td>
<td>1.134</td>
<td>0.060</td>
<td>0.596</td>
<td>1.235</td>
</tr>
<tr>
<td>( \beta_{+1} )</td>
<td>51,274</td>
<td>0.696</td>
<td>0.733</td>
<td>0.222</td>
<td>0.610</td>
<td>1.078</td>
</tr>
<tr>
<td>( \beta_{-1} + \beta_{+1} )</td>
<td>55,502</td>
<td>0.699</td>
<td>0.699</td>
<td>0.250</td>
<td>0.615</td>
<td>1.060</td>
</tr>
<tr>
<td>( \beta_{+1} + \beta )</td>
<td>54,460</td>
<td>0.697</td>
<td>0.686</td>
<td>0.252</td>
<td>0.611</td>
<td>1.049</td>
</tr>
<tr>
<td>( R_{-1} )</td>
<td>53,352</td>
<td>0.032</td>
<td>0.392</td>
<td>-0.188</td>
<td>0.022</td>
<td>0.237</td>
</tr>
<tr>
<td>( R )</td>
<td>53,367</td>
<td>0.055</td>
<td>0.669</td>
<td>-0.306</td>
<td>0.036</td>
<td>0.405</td>
</tr>
<tr>
<td>( R_{+1} )</td>
<td>53,339</td>
<td>0.020</td>
<td>0.389</td>
<td>-0.203</td>
<td>0.011</td>
<td>0.229</td>
</tr>
<tr>
<td>( R_{+1} + R_{-1} )</td>
<td>53,333</td>
<td>0.034</td>
<td>0.333</td>
<td>-0.160</td>
<td>0.023</td>
<td>0.209</td>
</tr>
<tr>
<td>( R_{+1} + R )</td>
<td>53,344</td>
<td>0.045</td>
<td>0.324</td>
<td>-0.141</td>
<td>0.031</td>
<td>0.215</td>
</tr>
</tbody>
</table>

Panel B: Regression of Changes in Beta on Expected Return News

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>( \beta ) - ( \beta_{-1} )</th>
<th>( \beta_{+1} + \beta ) - ( \beta_{-1} )</th>
<th>( \beta_{+1} - \beta )</th>
<th>( \beta_{+1} - \beta_{-1} )</th>
<th>( \beta_{+1} - (\beta + \beta_{-1}) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-0.035***</td>
<td>-0.001</td>
<td>0.035***</td>
<td>0.001</td>
<td>-0.001</td>
</tr>
<tr>
<td>( Nrp )</td>
<td>1.489</td>
<td>2.147***</td>
<td>(0.005)</td>
<td>(0.003)</td>
<td>(0.003)</td>
</tr>
<tr>
<td>( Nep )</td>
<td>0.424***</td>
<td>0.195***</td>
<td>(0.095)</td>
<td>(0.058)</td>
<td>(0.058)</td>
</tr>
<tr>
<td>( Nrf )</td>
<td>8.032*</td>
<td>7.768***</td>
<td>0.035***</td>
<td>(4.186)</td>
<td>(2.851)</td>
</tr>
<tr>
<td>( Nef )</td>
<td>0.184</td>
<td>0.269*</td>
<td>0.344***</td>
<td>(0.211)</td>
<td>(0.144)</td>
</tr>
<tr>
<td>( n )</td>
<td>50,077</td>
<td>52,675</td>
<td>51,201</td>
<td>51,244</td>
<td>50,077</td>
</tr>
<tr>
<td>( R^2 )</td>
<td>0.00004</td>
<td>0.00003</td>
<td>0.00001</td>
<td>0.00001</td>
<td>0.00001</td>
</tr>
</tbody>
</table>

*, **, *** Indicate significance levels of 10 percent, 5 percent, and 1 percent, respectively.

Panel A provides summary statistics for the market betas and the averaged daily returns. \( \beta_{-1} \) \( (R_{-1}) \) is the beta (average daily return) from the prior quarter filing date to the current quarter preliminary earnings announcement. \( \beta \) \( (R) \) is the beta (average daily return) from the current quarter preliminary earnings announcement to the current quarter filing date. \( \beta_{+1} \) \( (R_{+1}) \) is the beta (average daily return) from the current quarter filing date to the next quarter preliminary earnings announcement. \( \beta_{+1} + \beta \) \( (R_{+1} + R) \) is the beta (average daily return) from the prior quarter filing date to the current quarter filing date. \( \beta_{+1} + \beta \) \( (R_{+1} + R_{+1}) \) is the beta (average daily return) from the current quarter preliminary earnings announcement date to the next quarter preliminary earnings announcement date. The betas are estimated using the market model and daily returns. We use the value-weighted market return as the independent variable.

Panel B shows the regressions results of changes in beta on expected return (risk) news controlling for earnings news. \( Nrp \) (\( Nrf \)) is expected return (risk) news on the preliminary earnings (SEC filing) date. \( Nep \) (\( Nef \)) is earnings news on the preliminary earnings (SEC filing) date. The dependent variables are the differences in betas across the various periods described above. For example, \( \beta - \beta_{-1} \) is the beta from the current quarter preliminary earnings announcement date to the current quarter filing date less the beta from the prior quarter filing date to the current quarter preliminary earnings date.

the period prior to the preliminary announcement to the period after the preliminary announcement but prior to the filing \( [\beta - \beta_{-1}] \) is unrelated to unexpected return news but significantly positively related to earnings news. One possible explanation is the noise in
Alternatively, the second column of Table 3, Panel B shows the regression where the dependent variable is the change in beta from the period prior to the current preliminary announcement to the period after the current preliminary announcement up to the next preliminary announcement \([\beta_{t+1} + \beta_t - \beta_{t-1}]\). Here both expected return (risk) and earnings news are highly significant.\(^{18}\)

The filing date results are more conclusive. The third column of Table 3 shows that the change in beta from the period prior to filing date (but after the preliminary earnings announcement date) to the period after the filing date \([\beta_{t+1} - \beta_t]\) is significantly related to expected return news (at the 10 percent level) but unrelated to earnings news. However, this result too may be a consequence of the high estimation error in \(\beta_t\). The fourth column of Panel B yields a more meaningful comparison. The dependent variables are the beta after the filing date and before the preliminary announcement in the next quarter less the same beta in the prior quarter \([\beta_{t+1} - \beta_{t-1}]\). The results show that the change in betas is positively and significantly associated (less than the 1 percent level with expected return (risk) news. The coefficient on earnings news is also positive and marginally significant (at the 10 percent level). The last column of Panel B shows the regression where the dependent variable is the difference between the beta after the filing and before the preliminary announcement in the next quarter and the beta from the prior quarter filing date to the current quarter filing date \([\beta_{t+1} - (\beta_t + \beta_{t-1})]\). The coefficients on both expected return news and earnings news are positive and significant (at less than the 1 percent level). This result is also subject to estimation error since the initial base includes both the preliminary announcement and the filing. Nonetheless, overall these results confirm that expected return news measures changes in risk, especially at the SEC filing date. The above results are robust when \textit{ex post} returns \((R_t)\) instead of betas are used to measure changes in firm discount rates.

Properties of Estimated News Items

This section briefly analyzes (untabulated) the properties of the estimated news items over time, pre- and post-EDGAR, ranked according to earnings quality, and for 10-Ks compared with 10-Qs. To facilitate the data analysis, we generate firm-quarter estimates of earnings news, expected return news, and related variance-covariance contributions by estimating the firm-quarter covariance matrix and assuming that all observations have the same VAR coefficient matrix.\(^{19}\) This procedure is executed using the VAR coefficient matrix with equity returns as of the preliminary earnings announcement date and repeated using the VAR coefficient matrix with equity returns as of the SEC filing date. A similar approach is used to estimate the variance decomposition of cash flow news and accrual news (Equation (10)), with equity returns as of the SEC filing date.

We find that the variances of expected return news around the preliminary announcement and SEC filing dates are fairly stable over the 13 sample years. The variances of earnings, cash flows, and accrual news are less stable; the variances of earnings news at the preliminary announcement and SEC filing dates increase from 1998 to 2002 and then

\(^{18}\) However, this result suffers from the potential contamination of the preliminary announcement date information with the SEC filing date information (in the current quarter).

\(^{19}\) For example, earnings news (Equation (A4) in the Appendix) is a function of the VAR coefficient matrix \((\mathbf{A})\) and the residuals from the VAR regressions (Equations (12a) through (12c)). Thus, earnings news and the variance contribution of earnings news can be estimated at the firm-quarter level using the VAR coefficient matrix and the vector of residuals \(\mathbf{\varepsilon}_{it} = [e_{it}, \delta_{it}, c_{it}]\), where \(e_{it}\) is the estimated residual from model \(j\) and \(i\) \((t)\) is the observation (time) index. The variance-covariance matrix \(\Omega_{it}\) is computed as \(\Sigma_{it} \Sigma_{it}\).
decrease back to their former level.\textsuperscript{20} Cash flow and accrual news volatilities are relatively stable from 1991 to 2001 and then decrease during 2002 and 2003.

Comparison of pre- and post-EDGAR variances yields inconclusive results. Whereas the variance contribution of earnings news post-EDGAR is significantly higher than earnings news pre-EDGAR, the variance contribution of cash flow and accrual news is significantly lower post-EDGAR. The lower variance contribution of accruals and cash flows post-EDGAR is attributable to the lower variance contributions of these factors in 2002 and 2003. Excluding these years from the analysis, we find that the variance contributions are of similar magnitude across the two periods.

Investors in firms with a large proportion of accruals are more likely to carefully assess the accrual information provided in SEC filings than investors in firms with a small proportion of accruals for whom the preliminary earnings disclosure may be almost completely sufficient. To examine the relation between the magnitude of accruals and the variances, we average and then rank the proportion of absolute value of accruals to total assets over the prior eight quarters, and assign the observations to quintile portfolios. We find that the average earnings news variance at the preliminary and filing dates as well as the average accruals and cash flow news variances increase monotonically with the proportion of accruals, consistent with our conjecture.\textsuperscript{21}

Finally, we find that while 10-Qs yield a significantly higher (at less than the 1 percent level) earnings news volatility relative to 10-Ks for preliminary earnings announcements, the reverse holds for the filing date. Consistent with Griffin (2003), 10-Ks yield a significantly higher (at less than the 1 percent level) earnings news volatility for earnings, accruals, and cash flow news than 10-Qs at the filing date.\textsuperscript{22}

\textbf{Variance Decomposition and the Information Environment}

We investigate the association between the variance contribution on the SEC filing date of expected return (risk), accrual and cash flow information components, and our main proxy for information asymmetry, the degree of investor sophistication, by regressing the variance contributions of these components on institutional ownership, after controlling for the information environment of the firm and other variables likely correlated with institutional holdings.\textsuperscript{23,24}

We use the following variables as proxies for the firm's information environment or as more general control variables in the regressions below. We include a dummy variable (EDGAR) with 1 if the period is post-EDGAR, and 0 otherwise. Given the conflicting findings of the univariate analysis we do not predict the sign of EDGAR. A dummy variable

\textsuperscript{20} These results are consistent with excess volatility for 2000 and 2001 shown in Griffin (2003, Figure 1).
\textsuperscript{21} Earnings persistence cannot be used to directly classify firms into quintiles to determine the differential variance contribution in each quintile since the VAR model underlying the variance decomposition methodology controls directly for persistence. On this issue, see Callen (2004).
\textsuperscript{22} This is likely due the fact that the fourth quarter exhibits increased activity relative to the other quarters on dimensions such as capital expenditures, bookings of accruals, and auditor adjustments. See for example, Callen et al. (1996) on capital expenditures, Das and Shroff (2002) on accruals, and Ettredge et al. (2000) on auditor adjustments. In addition, the 10-K report is audited so that 10-Ks should yield greater earnings news volatility and, hence, unexpected return volatility than 10-Qs.
\textsuperscript{23} We repeat all the analyses using the variance contributions of expected return (risk) and earning news from the earnings model at the filing date. The results are similar to those reported.
\textsuperscript{24} Following the extant literature, we employ two empirical proxies for the level of investor sophistication: the percentage of shares outstanding held by institutions and the number of institutions holding the shares. Since both proxies yield very similar results, we report our results only for the percentage of shares outstanding held by institutions.
(FD), taking on a value of 1 if the period is post-Regulation FD, and 0 otherwise, is included to control for the possibility that earnings news on the SEC filing date changed after Regulation FD when firms are less likely to engage in partial disclosure to select investors. 25 We incorporate a dummy variable, ANN, which equals 1 if the report is annual (10-K), and 0 otherwise (if 10-Q). We also include a dummy variable taking the value of 1 if the firm provides balance sheet information on accounts receivable, inventory, and accounts payable in the preliminary earnings release, and 0 otherwise (PREBS). Firms that provide more balance sheet information with preliminary earnings should show less cash flow/accurial news volatilities on the SEC filing date. 26

Similarly, we include a dummy variable taking the value of 1 if the firm provides net operating cash flow information in the preliminary earnings release, and 0 otherwise (PREOCF). Holding everything else constant, we expect less accruals/cash flow volatilities on the SEC filing dates if accruals and cash flow information are available in the preliminary earnings release prior to the SEC filing date. 27 The information environment of the firm, specifically its level of information asymmetry, may also be related to company losses because the relation between losses and future cash flows is weaker for loss than for profit firms. In addition, Ertlimur (2004) shows that the bid-ask spread for loss firms is greater than for profit firms, indicative of greater information asymmetry by loss firms. To capture the effect of losses on information asymmetry, we incorporate a loss variable (LOSS), which is defined as the number of loss quarters in the past 20 quarters. 28 Firms with a greater string of losses are likely to exhibit higher news volatilities on SEC filing dates. We include a variable ACC_PROP defined to be the absolute value of the ratio of total accruals to average total assets in the past eight quarters to proxy for the relative importance of accruals in earnings. Finally, we control for the variance contribution of preliminary earnings (VARNEP) in the accruals and cash flows regressions since the magnitude of the information content of the 10-Q/1-K at the filing date may be correlated with shocks to earnings at the preliminary earning announcement date. We make no prediction about the relationship between VARNEP and the volatility of news items at the SEC filing date. Similarly, in the expected return (risk) news regression we include the variance contribution of expected return (risk) news at the preliminary earnings date (VARNRP). 29

Since there is potential endogeneity between institutional investors’ investment decisions and the usefulness of financial statement information around SEC filing dates, we estimate the relation between the variance contributions of the earnings components and institutional holdings using two-stage least squares (2SLS) in conjunction with firm and fiscal-quarter fixed effects panel techniques. Table 4 shows the second stage of the 2SLS

---

25 Although Regulation FD limits the firm’s ability to disclose information to selected group of investors, it is still an open empirical question whether the total disclosure following Regulation FD has decreased or increased. Consequently, we do not predict the sign of the coefficient on FD.

26 It should be noted that PRERS only measures whether the firm provided information on selected current accruals in the preliminary earnings release, and not about the availability of net operating cash flows and total accruals.

27 Levi (2004) and Louis et al. (2005) provide evidence that market reactions around preliminary earnings announcements and SEC filing dates are different for firms that disclose sufficient balance sheet information to estimate accruals in their preliminary earnings releases.

28 See also Huddart and Ke (2004).

29 Firm size (SIZE) is also an information environment proxy because larger firms tend to be followed and monitored by more analysts and investors and, thus, there are likely less information asymmetries between large firms and investors. In addition, there is a stronger market reaction at earnings announcements for small firms (Bamber 1987) suggesting a greater volatility of returns. We do not include SIZE in the main regression because of the high correlation with institutional ownership. The results of a regression with SIZE instead of institutional ownership are similar to those reported. For a similar reason, we do not include the number of analysts following the firm.
Regression of the variance contributions of expected return (risk), accrual, and cash flow news as of the SEC filing date on the percentage of ownership by institutional investors (INS_HOL), and on the other informational and control variables. Following Bushee (2001), in the first stage (nontabulated), institutional ownership is regressed on SIZE (log of market value of equity at the beginning of the fiscal quarter), ROE (net income divided by beginning book value of equity), Standard & Poor’s stock rating, SP500 (an indicator variable that takes the value of 1 if the firm is included in the S&P 500, and 0 otherwise), volume (log of average monthly volume divided by shares outstanding over prior year), dividend yield, leverage (as measured as debt-to-assets), market-adjusted returns over the fiscal year,
loss (the proportion of loss quarters to total quarters in the past five years), average sales growth over the prior 8 quarters, and R&D (R&D expense divided by sales).

Consistent with H4, Table 4 shows that the variance contributions of accruals and cash flow news are negatively and significantly (at less than the 1 percent level) related to the level of investor sophistication as proxied by institutional holdings. Contrary to our expectation the coefficient on INS_HOL is positive and significant in the expected return (risk) regression. However, as we show below, this result is attributable to the aggregation of institutional ownership across investor types. The coefficient on EDGAR is positive and significant suggesting that volatilities have increased post-EDGAR. The coefficient on ANN is positive and significant, indicating larger return volatility around annual reports than quarterly reports.30 As expected, firms with a higher proportion of accruals display larger accrual and cash flows volatilities. Similarly, firms with more extensive losses also show significantly larger news volatilities, consistent with loss firms having greater information asymmetry. In addition, firms with higher earnings news volatilities on the preliminary earnings date also display higher news volatilities on the filing date, indicating that the informativeness of the financial report is positively related to the initial shock to earnings. The FD variable is positive and statistically significant in the cash flows regression only. Although PREBS and PREOCF have the expected sign, they are not statistically significant (PREOCF is negative and significant in the expected return variance regression).

Table 5 replicates Table 4 except that institutional holdings are disaggregated into “dedicated,” “quasi-indexer,” and “transient” investors as per Bushee (1998, 2001). The results are similar to those reported in the baseline regressions and Table 4, so only the main differences are discussed. The coefficient on FD is now negative and significant across the three regressions, and the coefficients on EDGAR are now insignificant (with the exception of the cash flows regression). Most importantly, consistent with H5, while there is a significantly negative relationship between the variance contributions of expected return (risk), cash flows, and accruals news components and institutional holdings by “dedicated” investors and “quasi-indexers,” there is a significantly positive relationship between the variance contributions of the expected return (risk) and cash flow news components and institutional holdings by “transient” investors. These results are consistent with longer-term, stable investors having the incentive to acquire more information about the firm prior to the filing date in order to better monitor firm performance and their investments. In addition, the non-negative coefficient on transient holdings is consistent with “transient” (momentum) investors focusing on short-term gains by investing in smaller more risky firms and minimizing their investment in information gathering and analysis.

Overall, the results in Table 4 and Table 5 indicate that the variance contributions of the three informational components are positively associated with the level of information asymmetry between the firm and its investors. The greater the information asymmetry the greater is the news contained in the financial statements and, therefore, the greater is the impact of the financial report on the volatility of unexpected stock returns.

VI. CONCLUSION

This study analyzes informational components that are value-relevant on (the preliminary announcement and) the SEC filing date using a variance decomposition analysis. Value relevance of an informational component is measured by its contribution to the volatility of unexpected returns. Although the variance decomposition methodology has many

30 Note that ANN represents the fiscal fourth quarter. The coefficients of the second and third fiscal quarter are suppressed in the tables.

The Accounting Review, October 2006
**TABLE 5**  

<table>
<thead>
<tr>
<th>Expected Sign</th>
<th>VARNRAC</th>
<th>VARNCF</th>
<th>VARNAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.0631***</td>
<td>7.7924***</td>
<td>3.8247***</td>
</tr>
<tr>
<td>(0.0133)</td>
<td>(0.6849)</td>
<td>(0.3643)</td>
<td></td>
</tr>
<tr>
<td>DED_HOL</td>
<td>-0.1319</td>
<td>-38.5257***</td>
<td>-15.4478***</td>
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<tr>
<td>(0.0876)</td>
<td>(4.5196)</td>
<td>(2.4044)</td>
<td></td>
</tr>
<tr>
<td>TRA_HOL</td>
<td>0.1215***</td>
<td>4.0243***</td>
<td>0.4436</td>
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<tr>
<td>(0.0148)</td>
<td>(0.7558)</td>
<td>(0.4021)</td>
<td></td>
</tr>
<tr>
<td>QIX_HOL</td>
<td>-0.1567***</td>
<td>-12.0421***</td>
<td>-6.9355***</td>
</tr>
<tr>
<td>(0.0269)</td>
<td>(1.3636)</td>
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</tr>
<tr>
<td>EDGAR</td>
<td>0.0000</td>
<td>-0.1284**</td>
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</tr>
<tr>
<td>(0.0010)</td>
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<td>(0.0284)</td>
<td></td>
</tr>
<tr>
<td>FD</td>
<td>-0.0077**</td>
<td>-1.2993***</td>
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</tr>
<tr>
<td>(0.0031)</td>
<td>(0.1612)</td>
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<td></td>
</tr>
<tr>
<td>ANN</td>
<td>+0.0057***</td>
<td>0.2305***</td>
<td>0.2570***</td>
</tr>
<tr>
<td>(0.0010)</td>
<td>(0.0502)</td>
<td>(0.0267)</td>
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</tr>
<tr>
<td>ACC_PROP</td>
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<tr>
<td>PREBS</td>
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</tr>
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<tr>
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<tr>
<td>LOSS</td>
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<td>0.0377***</td>
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<td>VARNEP</td>
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<td>(0.0246)</td>
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<td>VARNRP</td>
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</tr>
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<td>(0.0007)</td>
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</tbody>
</table>

* *, **, *** Indicate significance levels of 10 percent, 5 percent, and 1 percent, respectively.

This table replicates Table 4 where institutional ownership (INS_HOL) is disaggregated by the proportion of shares held by “dedicated” institutional investors (DED_HOL), “quasi-indexer” institutional investors (QIX_HOL), and “transient” institutional investors (TRA_HOL). All other variables are as defined in Table 4.

The regressions are estimated using two-stage least squares for firm and fiscal quarter fixed-effect panel data to control for the endogeneity in the investment decision of institutional investors (see the notes to Table 4).

strengths, it also has limitations. These include the fact that variance contributions cannot be compared across models, so it is impossible to assess, for example, whether the decomposition of earnings into cash flows and accruals actually provides more explanatory power than earnings alone for the volatility of unexpected returns. An additional limitation is that when too many variables are included in the VAR system, the estimated coefficients tend to become unstable. Thus, the researcher has to trade off a comprehensive set of possible determinants of the volatility of unexpected returns for parsimony. As a result, the model is best suited to assess the relative volatility contributions of different pre-determined earnings and expected return components and less useful in determining which particular components (among many alternatives) might explain volatility.

Subject to these limitations, this study finds that both expected return (risk) and earnings news are value-relevant on the preliminary earnings and SEC filing dates with earnings
news the dominant informational component in terms of economic significance. Expected return (risk) news, accrual news, and cash flow news are all found to be value-relevant with both accrual news and cash flows dominating expected return news in terms of economic significance. Contrary to Callen and Segal (2004) for annual data, cash flow news is found to be more value-relevant than accrual news in driving the volatility of unexpected returns around the SEC filing date. Furthermore, this study shows that the earnings, cash flow, and accruals news exhibit changes in time-series pattern, especially in later years. Consistent with recent research, this study also shows that earnings, cash flow, and accruals news are more value-relevant at the SEC filing date for 10-K forms than for 10-Q forms. They are also more value-relevant for firms with a larger proportion of accruals in earnings. The results comparing pre- and post-EDGAR are inconclusive. Whereas the variance contribution of earnings news post-EDGAR is significantly higher than earnings news pre-EDGAR, the variance contribution of cash flows and accruals news are significantly lower post-EDGAR.

Although earnings news is more economically significant than expected return (risk) news in driving unexpected return volatility at both the preliminary and SEC filing dates, expected return (risk) news is, nevertheless, shown to be significantly correlated with changes in betas and returns at the preliminary and SEC filing dates, indicating that expected return news is associated with changes in firm risk and discount rates.

This study also documents that each of the expected return (risk), accrual, and earnings news contain less value-relevant information at the SEC filing date for firms that have a higher proportion of sophisticated investors with long-term investment horizons. The opposite result obtains for transient momentum investors. This is consistent with the notion that sophisticated investors with long-term investment horizons are likely to gather and process information that helps them to assess the quality of preliminary earnings before the SEC filings become available. In contrast, transient momentum investors are unlikely to gather information prior to the SEC filing and, if anything, they are more likely to invest in firms with excess volatility. These findings support a negative association between the value relevance of SEC filings and the degree of information asymmetry between the firm and its investors.

**APPENDIX**

**Variance Decomposition Estimation**

As shown by Campbell (1991), the variance decomposition can be implemented empirically by combining the residuals from the VAR estimation with the unexpected current return valuation equation (Equation (1)). Formally, let \( e^i = (0, ..., 1, ..., 0) \), where the 1 is in the \( i \)th position. The unexpected change in returns is computed as:

\[
r_t - E_{t-1}(r_t) = e^i \eta_{it}.
\]  

(A1)

Equation (11) implies that forecasts of the state vector \( z_{it} \) can be computed as:

\[
E[z_{it+1}^i] = A^{i+1}z_{it}.
\]

(A2)

Using Equation (A1), the revision in expected future returns (expected return or risk news) is computed as:

*The Accounting Review, October 2006*
\[ \Delta E_t \sum_{j=1}^{\infty} \rho^j r_{t+j} = E_t \sum_{j=1}^{\infty} \rho^j r_{t+j} - E_{t-1} \sum_{j=1}^{\infty} \rho^j r_{t+j} = e(1 - \frac{1}{1 - \rho}) \eta_{t+i} = \lambda_i \eta_{t,i}. \quad (A3) \]

Similarly, the revision in expected future earnings, earnings news, is computed residually as:\[^{31}\]

\[ \Delta E_t \sum_{j=0}^{\infty} \rho^j roe_{t+j} = r_t - E_{t-1} r_t + \Delta E_t \sum_{j=1}^{\infty} \rho^j r_{t+j} = (e + \lambda_1) \eta_{t,i}. \quad (A4) \]

The variances and covariance of the variance decomposition (Equation (5)) are obtained from the estimated variance-covariance matrix \( \Omega = E(\eta_{t,i} \eta_{t,i}' ) \). Specifically, the variances and covariance of expected return news and earnings news are computed as:

\[ \text{var}(N r_t) = \lambda_1 \Omega \lambda_1; \quad \text{var}(N e_t) = \lambda_2 \Omega \lambda_2; \quad \text{cov}(N r_t, N e_t) = \lambda_1 \Omega \lambda_2. \]

**REFERENCES**


[^{31}]: Following Vuolteenaho (2002), Callen and Segal (2004), and Callen et al. (2005), we assume that \( \rho = 0.967 \) on annual basis. Since we use quarterly date we assume that \( \rho = 0.99 \). Following the literature, earnings news is computed on a residual basis as in Equation (A4). In order that accrual and cash flow news are measured comparably, we compute both on a nonresidual basis.


