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The Role of Investor Communications and Corporate Disclosure Policy on Price Anticipation of Earnings*

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Abstract

This paper examines the role of investor relations and corporate disclosure policy on price anticipation of future earnings. Specifically, it investigates two interrelated questions: (1) whether stock prices anticipate future earnings earlier for firms with more informative disclosure policy than for firms with less informative policy, and (2) whether such price anticipation is an increasing function of the informativeness of corporate disclosures released through alternative media such as investor relations, annual reports and quarterly reports. While this paper examines price anticipation of future earnings, the focus is on whether such one-year-ahead anticipation is a function of the informativeness of categorical corporate disclosures.

Our empirical results indicate that market-adjusted returns of firms with more informative disclosure policy start to reflect earnings changes 20 months prior to the fiscal year-end, about four months ahead of those of firms with less informative policy. The lead is statistically significant. Multivariate analysis demonstrates that the one-year-ahead anticipation of prices over earnings increases in the informativeness of investor relations, but does not vary systematically with the informativeness of annual and quarterly reports. Our results shed light on the importance of effective investor communications, consistent with Healy and Palepu (1995).

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1. **Introduction**

While financial statements remain a central feature of financial reporting, corporate disclosures have become increasingly important in firms’ communications with external parties. This paper examines the role of investor relations and corporate disclosure policy on price anticipation of future earnings. Specifically, we investigate two interrelated questions: (1) whether stock prices anticipate future earnings earlier for firms with more informative disclosures than for firms with less informative disclosures, and (2) whether such price anticipation is an increasing function of informativeness of corporate disclosures released through investor relations and annual and quarterly reports. Following Beaver, Lambert and Morse (1980), Collins, Kothari and Rayburn (1987), and Freeman (1987), we examine price anticipation of earnings over one-year-ahead forecast horizons. Unlike the prior studies, however, we focus on whether such one-year-ahead price anticipation is a function of the corporate disclosure policy and the informativeness of categorical corporate disclosures. Thus our results are expected to yield insights into which categories of disclosures are more effective in communicating firm-specific information to investors.

This paper extends prior research on price anticipation of future earnings in two ways. First, this is the first study that directly examines the association between price anticipation and the informativeness of investor relations and other corporate disclosures. Second, we examine timing issues related to price anticipation as a function of a firm’s overall corporate disclosure policy. Our first research question has potential implications for assessing the significance of company-provided disclosures as a source of firm-specific information about future earnings. Healy and Palepu (1993) argue that disclosures are a unique, nonsubstitutable source of firm-specific information. Amir and Lev (1996) and Bryan (1997) report that certain non-financial disclosures also assist investors in assessing a firm’s future prospects. Holthausen and Verrecchia (1988) establish that the magnitude of price reactions to releases of information is an increasing function of the informativeness of the new information. Thus, we predict that stock prices should reflect future earnings earlier for firms with more informative disclosures than for firms with less informative disclosures. This research question is empirically tested with a research design similar to Freeman (1987). We develop proxies for the informativeness of overall and categories of disclosures based on the Association for Investment Management and Research Corporate Information Committee (AIMR) Reports. The second research question examines the impact on price anticipation of the relative importance of categorical disclosures released through different media. Managers communicate with investors through different media, such as annual reports, quarterly reports, and investor relations. These

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1 In this paper, we focus on the informativeness of firms’ disclosure policies. That is, we examine the effects of overall disclosures and categories of disclosures, instead of the information content of individual items of disclosures. Disclosures include all mandatory and voluntary releases of information from the firms to the public. They are divided into three categories based on the media of their releases, i.e., annual reports, quarterly reports, and investor relations.

2 Lang and Lundholm (1993, 1996), Sengupta (1998), and Qi, Wu and Haw (2000) also develop their informativeness variables from evaluation scores published in the AIMR Reports. The evaluation scores were published by the Financial Analyst Federation (FAF) Corporate Information Committee prior to 1989. The FAF has since merged with the Institute of Chartered Analysts to form AIMR.
media differ in management discretion, regulatory requirements, and timing flexibility, and information disclosed through them may affect price anticipation of earnings differently. We address this question by examining whether the lead earnings response coefficient, obtained from regressing abnormal returns in the year of disclosures on earnings changes in the next year, is an increasing function of the informativeness of investor relations and annual and quarterly reports. Proxies for the informativeness of firms’ disclosures and the effectiveness of investor communication are also developed from the AIMR Reports.

Based on a sample of 1,349 firm-years between 1983 and 1991, our empirical results indicate that market-adjusted returns of firms with more informative disclosures start to reflect earnings changes 20 months prior to the fiscal year-end, about four months ahead of those of firms with less informative disclosures. The lead is statistically significant. Our multivariate analysis indicates that, after controlling for firm size and analyst following, the one-year-ahead anticipation of prices over earnings increases in the informativeness of investor relations, but does not vary systematically with the informativeness of annual and quarterly reports. The size effect becomes statistically insignificant after controlling for the effects of disclosures.\(^3\) Our results shed light on the importance of effective information communications between corporations and investors as asserted by Healy and Palepu (1995).

The rest of this paper is organized as follows. The next section provides motivations and develops hypotheses. Research design and variable measurements are outlined in section 3. Section 4 describes the sample and variables. Empirical results and sensitivity analysis are reported in section 5. The last section summarizes and concludes.

2. Motivation and Hypotheses

The one-year-ahead price anticipation of earnings changes is a well-documented empirical regularity. Beaver, Lambert and Morse (1980) report that price changes are useful in forecasting next year’s earnings changes. Collins, Kothari and Rayburn (1987) and Freeman (1987) investigate whether the lead of price over earnings is a function of firm size, which proxies for the amount of information availability and the numbers of traders and analysts that process the information. Collins, Kothari and Rayburn (1987) show that the price-based earnings forecasts outperform univariate time series forecasts by a greater margin for larger firms than for smaller firms. Freeman (1987) finds that the pooled abnormal returns begin to reflect earnings changes 22 months before fiscal year-end for large firms, three months earlier than pooled abnormal returns for small firms. Moreover, the percentage of abnormal returns realized in early months for large firms exceeds the percentage for small firms (see also Collins and Kothari [1989]; Kothari and Sloan [1992]; Collins, Kothari, Shanken, and Sloan [1994]; Ayers and Freeman [1997]). This paper extends the extant literature on price anticipation and investigates whether the one-year-ahead price anticipation of earnings is a function of the informativeness of investor communications and corporate disclosures.

\(^3\) However, the result on size in our paper should be interpreted with caution. We further discuss the issue in note 17.
2.1 The Timing Hypothesis

The information economics perspective generally assumes that managers have superior information on their firms’ current and future performance relative to outside investors (e.g., Jensen and Meckling [1976], Fama and Jensen [1983a, 1983b], Holthausen and Leftwich [1983]). In recognition of such information asymmetry between managers and investors, financial reporting in the U.S. has been developed and designed to “provide information to help present and potential investors and creditors and other users in making rational investment, credit, and similar decisions.” In addition to mandated financial statements, voluntary corporate disclosures have become increasingly important in firms’ communications with external parties. Certain disclosures, such as news releases and management’s earnings forecasts, are voluntary and subject to management discretion. Others are mandated by either the Generally Accepted Accounting Principles (GAAP) or Securities and Exchange Commission (SEC) regulations. Barth and Murphy (1994) examine the purposes, subject, number, and trends of financial statement disclosures required by the FASB and its predecessors. They report that 454 disclosure items are mandatory under GAAP through Statement of Financial Accounting Standards (SFAS) No. 109, and that there exists a clear trend of increasing disclosure requirements over time.

Under the current financial accounting and reporting system, corporate disclosures are an important source of incremental information about firms’ future performance. FASB believes that corporate disclosures serve four purposes: (1) to describe and provide additional relevant measures of items that are recognized on the face of the financial statements, (2) to describe and provide useful measures of items that are not recognized in the financial statements, (3) to provide information to help investors and creditors assess risks and potentials of both recognized and unrecognized items, and (4) to provide important information in the interim while other accounting issues are being studied in more depth. Because the existing accrual accounting system under GAAP is based on historical transaction data and emphasizes objectivity, verifiability, and conservatism, instead of unbiased estimation of future earnings, disclosure items can reveal, either directly or indirectly, relevant information about future earnings in addition to financial statements. As a result, if the disclosure is relevant and informative in the year of disclosure, investors can update and improve their expectations of next year’s earnings. Empirically, this means that returns in the year of disclosures anticipate next year’s earnings changes. Healy and Palepu (1993) state that disclosures are a unique, nonsubstitutable source of firm-specific information. Amir and Lev (1996) and Bryan (1997) indicate that certain non-financial disclosure help investors in assessing a firm’s future performance. Thus, we expect that the price anticipation of earnings should be observed earlier for firms with more informative disclosures than for firms with less informative disclosures. This leads to hypothesis one in its alternative form:

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H1: Ceteris paribus, abnormal returns associated with accounting earnings changes start earlier for firms with more informative disclosures than for firms with less informative disclosures.

However, corporate disclosures are just one of the many sources of information about firms' prospects. Prices also incorporate information from sources such as private searches by investor and analysts (Collins, Kothari, and Rayburn [1987]; Freeman [1987]), information releases by other firms in the same industry (Han, Wild and Ramesh [1989]; Ayers and Freeman [1997]) and trade associations (Chandra, Procassini and Waymire [1997]). Corroborating evidence also comes from studies on the valuation implications of disclosures on pensions and fair value estimates, which find that market values reflect information in these disclosures prior to their public releases. Empirically, if the information in the disclosures is preceded by information from other sources, the empirical regularity predicted by H1 may not be observed.

2.2 Hypothesis on Price Anticipation by the Disclosures through Different Media

Hypothesis 1 focuses on the effect of overall disclosures on the timing of price anticipation of earnings changes. Managers, however, communicate with investors through different media, such as annual reports, quarterly reports, and investor relations. These media differ in management discretion, regulatory requirements, and timing flexibility. Prior studies (e.g., Ball and Brown [1968]; Freeman [1987]; Collins and Kothari [1989]; Kothari and Sloan [1992]) indicate that prices anticipate annual earnings changes because of the existence of other more timely information. For example, disclosures in the annual and quarterly reports have to be released by mandated dates in mandated formats while disclosures through investor relations are mainly voluntary and more flexible in timing. Consequently, information disclosed through different media may affect price anticipation of earnings changes differently. Holthausen and Verrecchia (1988) argue that the price reaction is an increasing function of the informativeness of the new information. This leads to hypothesis two in its alternative form:

H2: Ceteris paribus, the positive association between abnormal returns in the year of disclosures and earnings changes in the next year is an increasing function of the informativeness of investor relations, annual reports, and quarterly reports.

3. Research Design and Variable Measurements

3.1 Proxies for Disclosure Informativeness

We use analysts’ evaluation scores for the annual reports, quarterly reports and investor relations published in the AIMR Reports to develop proxies for the informativeness of overall disclosures and disclosures released through different media. Appendix 1 shows the criteria with which the AIMR Corporate Information Committee makes the evaluations, while Appendix 2 shows the evaluation scores for the machinery industry in fiscal year 1991. According to the AIMR Corporate

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6 For example, Barth (1994) examines the relation between fair value disclosures and bank share prices. She finds that, while fair values of investment securities possess significant incremental explanatory power, such fair values are reflected in bank share prices at fiscal year-end before their public releases in the annual reports.
Information Committee, each year an industry-specific subcommittee composed of leading analysts following the industry evaluates the informativeness of selected firms’ disclosures along with three dimensions: annual published information, quarterly and other published information, and investor relations and other aspects. As shown in Appendix 1, the evaluation criteria for the informativeness consider, among many disclosure characteristics, the availability of additional voluntary information, timeliness of the disclosures and press releases, content and frequency of presentations to analyst groups, etc. Characteristics and issues unique to the industry are also taken into consideration in the evaluation process. Scores along with these three dimensions are then weighted to obtain an overall score about the informativeness of the firm’s disclosure practices. The weights are in general 40-50 percent for the annual published information, 30-40 percent for the quarterly and other published information, and 20-30 percent for investor relations and other aspects. While the majority of the subcommittees report both overall and category scores, some subcommittees publish only the overall scores.7

Because firms in different industries are evaluated by different subcommittees and members of the same subcommittees are not necessarily the same in different years, the raw scores reported by the subcommittee must be standardized to provide meaningful proxies for disclosure informativeness. This is achieved by defining relative industry rankings for overall disclosures (RIRT) as the following:

\[
RIRT_{it} = \frac{RANK_{it} - 1}{N_{jt} - 1},
\]

where \(N_{jt}\) is the number of firms for industry \(j\) in year \(t\), and \(RANK_{it}\) is the rank, in ascending order, of firm \(i\) in year \(t\) within industry \(j\) based on analysts’ evaluation score for overall disclosures. This conversion yields the percentile of the firm’s rank within its industry-year, so the lowest-ranking (worst) firm receives a zero and the highest-ranking (best) firm receives a one. Analysts’ evaluation scores for annual reports, quarterly reports, and investor relations are used as proxies for the informativeness of disclosures released through annual reports (RIRA), quarterly reports (RIRQ), and investor relations (RIRI), similarly defined as RIRT.

3.2 Methodology for Hypothesis 1: Timing of Price Anticipation

Hypothesis 1 predicts that returns begin to reflect the next year’s earnings changes earlier for firms with more informative disclosures than for firms with less informative disclosures. As Lang and Lundholm (1996) note, relative industry ranking of disclosure scores reflects only intra-industry variation in disclosure informativeness. Since firms’ information environments are affected by industry membership, we control for inter-industry variation in disclosure informativeness by the following procedure. Each year, firms in the same industries are placed into either low-disclosure (LD), medium-disclosure (MD), or high-disclosure (HD) portfolios based on their RIRT values. RIRT is used because it captures the overall effectiveness of the firm’s disclosure practice. The number of firms in

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7 As a result, about one-third of firm years in the AIMR Reports have no category scores reported and are therefore not included in the sample as shown in table 1. Our research design requires separate scores as proxies for the informativeness of disclosures.
HD and LD are kept the same. We then use a matched-pair design to document the differences between when returns start to reflect next year’s earnings changes for the LD and HD portfolios. Statistical tests are based on the intertemporal distributions of such differences.

We define $UE_{it+1}$ as scaled earnings change per share. It is obtained by subtracting primary earnings per share before extraordinary items (EPS) of year $t$ from that of year $t+1$ and then scaling the difference by share price at the beginning of year $t$. Both EPS and share prices are adjusted for stock splits and stock dividends. Market-adjusted returns are calculated for each firm in each of the 30 months starting from the beginning of year $t$ as the difference between the actual return and the CRSP equally weighted market return index. To test H1, we first estimate the following regression separately for LD and HD portfolios in each year,

$$CMR_{itn} = \alpha_{tn} + \beta_{tn} UE_{it+1} + \epsilon_{itn},$$

where $CMR_{itn}$ is cumulative market-adjusted returns for firm $i$ in year $t$ over a six-month moving window indexed by $n$. In year $t$, the first window starts from the beginning month of year $t$ ($n = 0$), and the last window starts from 24 months later ($n = 24$). After estimating the regression in each sample year separately for LD and HD firms for each month between $n = 0$ to 24, we then identify the first $n$ value for which $\beta_{tn}$ is statistically positive at the 0.05 level (one-sided) and note it as $n_{LD}^t$ for LD firms and $n_{HD}^t$ for HD firms, respectively. Their difference is defined as $\Delta n^t = n_{LD}^t - n_{HD}^t$. For example, for year 1991, if the coefficient of $UE_{it+1}$ in the above regression first becomes significant at the 0.05 level six months since the beginning of 1991 for HD firms and ten months for LD firms, then $n_{LD}^1 = 10$, $n_{HD}^1 = 6$, and $\Delta n = 4$. H1 predicts $\Delta n$ to be significantly positive. The statistical test is based on the intertemporal distribution of $\Delta n$ using both the Wilcoxon signed rank test and the $t$ test.

3.3 Methodology for H2: Price Anticipation by Disclosures through Different Media

Hypothesis 2 posits that the association between abnormal returns in the year of disclosures and earnings changes in the next year increases in the informativeness of annual reports, quarterly reports, and investor relations. It is tested via the following regression in which observations are pooled both cross-sectionally and intertemporally:

$$CMR_{it} = \alpha + \sum_{i=1}^{91} \lambda_i D_i + \delta_1 RIRA_{it} + \delta_2 RIRQ_{it} + \delta_3 RIRI_{it} + \delta_4 LSIZE_{it} + \delta_5 ANA_{it} + \beta_1 UE_{it+1} + \beta_2 RIRA_{it} * UE_{it+1} + \beta_3 RIRQ_{it} * UE_{it+1} + \beta_4 RIRI_{it} * UE_{it+1} + \beta_5 LSIZE_{it} * UE_{it+1} + \beta_6 ANA_{it} * UE_{it+1} + \epsilon_{it},$$

where

$$CMR_{it} = \text{market-adjusted returns in year } t \text{ for firm } i \text{ cumulated from the fifth month of year } t \text{ to the fourth month of year } t+1, \text{ obtained from CRSP tapes}^9.$$
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\[ UE_{it+1} = \text{the difference between earnings per share before extraordinary items of year and that of year } t, \text{ scaled by per share price at the beginning of year } t, \text{ obtained from the Compustat tapes}, \]

\[ D_t = \text{a dummy variable that equals one for year } t, \text{ and zero otherwise}, \]

\[ RIRA_{it} = \text{relative industry ranking of the informativeness of annual report, for firm } i \text{ in year } t, \]

\[ RIRQ_{it} = \text{relative industry ranking of the informativeness of quarterly reports, for firm } i \text{ in year } t, \]

\[ RIRI_{it} = \text{relative industry ranking of the informativeness of investor relations, for firm } i \text{ in year } t, \]

\[ LSIZE_{it} = \text{the logarithm of } SIZE_{it}, \text{ the market value at the beginning of year } t \text{ for firm } i, \text{ obtained from Compustat tapes}, \]

\[ ANA_{it} = \text{the total number of analyst forecasts made in year } t \text{ for firm } i, \text{ obtained from IBES tapes}, \]

\[ \varepsilon_{it} = \text{a random, normally distributed error term}. \]

\[ LSIZE_{it} \text{ and } ANA_{it} \text{ are included to control for the potential effects of size and analyst following on firms’ information environments. H2 predicts that } \beta_2, \beta_3, \text{ and } \beta_4 \text{ should be positive.} \]

4. Sample Selection and Descriptive Statistics

4.1 Sample Selection

Panel A of table 1 describes the sample selection process from 1983 to 1991. The 1983-1991 AIMR Reports contain 4,390 firm-years, of which 168 firm-years are eliminated due to the unavailability of CRSP data. Additional 408 firm-years are deleted due to the lack of Compustat data, 1,036 non-NYSE firm-years to control for the effects of different stock exchanges (Grant 1980), 276 firm-years due to the lack of analyst following data per IBES tapes, 18 firm-years with \( UE_{it+1} \) larger than one, and 564 firm-years with non-December 31 fiscal year-end. The sample is further reduced by 532 firm-years in which the industry subcommittees do not report category scores, and 39 firm-years with only two observations in their respective industry-year groups.

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9 Equally-weighted market return index is used. The window is selected to capture disclosures made in year \( t \) and exclude those released in other time periods. Note that annual and 10-K reports of year \( t \) are not released until early months of year \( t+1 \). See Alford, Jones and Zmijewski (1994) for further reference.

10 Most firms are in either international banking or international pharmaceutical industries.

11 One possible reason why the subcommittees do not disclose the category rankings is that the industries involved have information environments different from the remaining industries. We observe that the majority of firm-years without category ranking data belong to financial services industries such as banking and insurance. Since financial services industries are regulated, their information environments are expected to be different from other industries. Our research design requires category scores for the tests of hypothesis two.

12 At least three observations are needed in each industry year to construct LD, MD, and HD portfolios.
The above selection procedure yields a final sample of 1,349 firm-years from 287 firms. As shown in panel B of table 1, the number of sample firms in each year ranges from 99 in 1985 to 214 in 1990, while the number of industries in each year ranges from 14 in 1985 and 1986 to 26 in 1990. The number of observations in each industry-year group is three at the minimum by research design. It is 16 at the maximum, indicating that in any given year, the sample is not dominated by a small number of industries.

4.2 Summary Statistics of Variables

Table 2 presents summary statistics for the sample. It indicates that our sample firms are on average actively followed by the analysts. The mean (median) of ANA$_{it}$ is 21.27 (21). This is of little surprise since many AIMR subcommittees exclude firms that are not evaluated by a minimum number of subcommittee members. Descriptive statistics also indicate that the distribution of SIZE$_{it}$ is skewed to the right, as indicated by a mean ($\$4,670$ million) that is much larger than the median ($\$2,140$ million), and a standard deviation ($\$7,874$ million) that is greater than the mean. As a result, its logarithm is used in correlation analysis. The average UE$_{it+1}$ is $-0.005$, close to zero. We also include two other variables, Book-to-Market Ratio (BM$_{it}$), and Common Stock Beta (BETA$_{it}$) because previous studies document that they are associated with the cost of equity capital (Botosan [1997]; Welker [1995]), which may directly or indirectly affect the informativeness of disclosures. The average book-to-market ratio (BM$_{it}$) is 0.661 and the mean of BETA$_{it}$ is 1.015, close to the unity.

Table 3 reports both Pearson (below the diagonal) and Spearman rank (above the diagonal) correlation coefficients between disclosure and control variables. The two sets of correlation coefficients are similar and the discussions are based on Spearman rank correlation coefficients. Consistent with results reported in previous studies (e.g., Lang and Lundholm [1993, 1996]), the proxy for the informativeness of the overall disclosure, RIRT$_{it}$, is positively correlated with both analyst following and firm size at the 0.01 level. This suggests that firms with more informative disclosure are generally characterized by larger market values and are associated with greater analysts following.

RIRT$_{it}$ is not significantly correlated with UE$_{it+1}$ at the conventional levels. Because RIRT$_{it}$ is a weighted average of the other three categorical rankings, it is not surprising that it is positively correlated with RIRA$_{it}$, RIRQ$_{it}$, and RIRI$_{it}$. Their correlation coefficients range from 0.71 to 0.81. Consistent with Lang and Lundholm (1993, 1996), the three category rankings are also significantly correlated with one another (p < 0.01), suggesting that firms coordinate disclosure policy across different media. The highest correlation coefficient is 0.60 between RIRA$_{it}$ and RIRQ$_{it}$, and the lowest is 0.45 between RIRQ$_{it}$ and RIRI$_{it}$. On the other hand, the correlation coefficient is substantially less than 1, which indicates that different categories may capture different aspects of disclosures.

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13 We further analyze the effect of these variables in section 5.3.

14 The correlations of RIRT$_{it}$ with BETA$_{it}$ and BM$_{it}$ (not reported in tables) are not statistically significant at the conventional levels.
5. Empirical Results

5.1 Results for H1: Timing of Price Anticipation

Hypothesis 1 states that abnormal returns associated with accounting earnings changes start earlier for firms with more informative disclosure policy than for firms with less informative disclosure policy. Before turning to formal statistical tests, we first seek to provide some direct visual evidence on H1. If earnings-relevant signals exist for multiple firms simultaneously, abnormal returns can be realized based on foreknowledge of such signals. A zero-investment hedge portfolio can be formed by taking an equally-weighted long position in firms with good news and a similar short position in firms with bad news, with the nature of the news derived from the signals. In empirical research, however, the signals themselves are difficult to observe. As a result, we use ex-post earnings realizations to separate firms into good news and bad news groups, similar to Freeman (1987). For each sample year \( t \), hedge portfolios are constructed separately for HD and LD firms by taking long positions in firms with \( UE_{it+1} > 0 \), and short positions in firms with \( UE_{it+1} < 0 \). Equal weights are given to firms within the same news groups.

Figure 1 graphs the intertemporal averages of cumulative market-adjusted returns (CMR) from the beginning of year \( t \), the year in which the disclosures are made, to April of year \( t+2 \), separately for LD and HD hedge portfolios. Consistent with H1, the positive trend starts four months after the beginning of year \( t \) for the HD portfolio, but does not begin until the seventh month for the LD portfolio. We also examine the beginning of positive trend of CMR by sample year (not tabulated). The positive trend starts on average 4.22 months after the beginning of year \( t \) for the HD firms, compared to 6.56 months for the LD firms. The difference of 2.34 months is statistically significant at the 0.05 level under Wilcoxon signed rank test. We also find that the magnitude of CMR over the entire time period of 28 months is similar for the HD (0.211) and LD (0.233) portfolios. However, 33.3 percent of the total are realized for the HD portfolio by the end of year \( t \) (n=12), compared with only 20.3 percent for the LD portfolio. This result is also consistent with H1.

Table 4 presents results from regressing cumulative market-adjusted returns in six-month moving windows (\( CMR_{itn} \)) on future unexpected earnings (\( UE_{it+1} \)) for LD and HD portfolios. Observations are pooled across sample years, and the first window starts at the beginning of year \( t \). For the LD firms, the association between \( CMR_{itn} \) and \( UE_{it+1} \) is not statistically positive until nine months after the beginning of year \( t \). The association peaks at the 17th month (five months after the end of year \( t \)) with the coefficient of \( UE_{it+1} (\beta_n) \) of 0.3938 and declines afterward. On the other hand, for the HD firms, the association between \( CMR_{itn} \) and \( UE_{it+1} \) is significantly positive (\( p=0.05 \)) five months after the beginning of year \( t \), which is four months earlier than the LD firms. The association peaks at the 13th month with the coefficient of \( UE_{it+1} \) of 0.5436, substantially higher than the comparable coefficient for the LD firms.

Table 5 tests whether the lead of HD firms over LD firms in Table 4 is statistically significant based on the distribution of the lead across sample years. In each sample year, \( CMR_{itn} \) is regressed on \( UE_{it+1} \) separately for HD and LD portfolios, with starting months from \( n = 0 \) to 24. The first \( n \) values for which the coefficient of \( UE_{it+1} \) is statistically positive at the 0.05 level are then identified separately for the LD and HD portfolios. Their difference is noted as \( \Delta n = n_{LD} - n_{HD} \), which H1 predicts to be
positive. As reported in Table 5, except for 1990, the coefficient of $UE_{it+1}$ ($\beta_{tn}$) becomes significantly positive at the 0.05 level earlier for the HD firms than for the LD firms in every sample year. The average of the lead across sample years is 4.34 months, which is statistically significant at the 0.05 level using either the $t$ test or the Wilcoxon signed rank test.

In sum, our empirical results strongly support H1. Some potential confounding factors, such as stock exchange and industry effects, fiscal year-end differences, and fiscal year-end changes, have already been controlled through the sample selection and research design. In general, such control mechanisms tend to bias against the maintained hypotheses by introducing noise to the relative industry ranking measures.\textsuperscript{15} Two variables that are not controlled by the research design are firm size and analyst following. As shown in Table 3, $\text{RIRT}_i$ is positively correlated with both $\text{LSIZE}_i$ and $\text{ANA}_i$. This raises the concern that the results reported above may in fact be attributable to size and analyst following effects, even though the magnitudes of the correlation coefficients are not substantial, only 0.0813 between $\text{RIRT}_i$ and $\text{LSIZE}_i$ and 0.1296 between $\text{RIRT}_i$ and $\text{ANA}_i$. To alleviate such concern, we include size and analyst following as control variables in the multivariate analysis below.

5.2 Regression Results for H2: Price Anticipation by Different Disclosure Channels

Under H2, we investigate which categories of disclosures are effective in communicating firm-specific information to investors. Regression results are presented in Table 6. While we include intercept and year dummies to control for the changes of economic conditions in each regression, we do not report their results for parsimony. In the simple regression of Model 1, the coefficient for $UE_{it+1}$ is positive and significant at 0.01 level with an adjusted $R^2$ of 3.4%. In Models 2 to 4, only one disclosure variable is added at a time. The adjusted $R^2$ is the highest for Model 4 that includes investor relations. The results indicate that both the coefficients of annual reports ($\text{RIRA}_i$ and $\text{RIRA}_i \times UE_{it+1}$) and investor relations ($\text{RIRI}_i$ and $\text{RIRI}_i \times UE_{it+1}$) are positive and significant ($p<0.05$), suggesting that annual reports and investor relations are effective in communicating information on earnings of year $t+1$ to investors. However, the coefficients of quarterly reports are positive but insignificant at conventional levels.\textsuperscript{16}

In Model 5, where $\text{LSIZE}_{it}$ and $\text{LSIZE}_{it} \times UE_{it+1}$ are included in addition to $UE_{it+1}$, their coefficients are significantly positive at the 0.10 and 0.05 levels respectively. This is consistent with prior evidence that investors can form more precise future earnings expectations for larger firms than for smaller firms (e.g., Collins, Kothari and Rayburn [1987]; Freeman [1987]). Model 6 includes analyst following variables ($\text{ANA}_i$ and $\text{ANA}_i \times UE_{it+1}$) in addition to $UE_{it+1}$. The coefficient of $\text{ANA}_i \times UE_{it+1}$ is significantly positive at the 0.10 level, providing weak evidence that price can better anticipate earnings of firms with heavier analyst followings. However, when the analyst following and size variables are

\textsuperscript{15} For instance, Southwest Airline was ranked the fourth among eight airlines evaluated in 1990 for the lack of market and segment data and limited access to senior management. Such a ranking would put it in the middle disclosure portfolio (MD) and exclude it from further analysis. However, two airlines with higher rankings are eliminated in the sample selection process for not being listed on the NYSE (British Airways PLC) and non-December fiscal year end (Delta). As a result, Southwest’s ranking is elevated to the second highest, placing it as a high disclosure (HD) firm in the 1991 sample. While such observations can be excluded as anomalies, they are kept in the sample to avoid making subjective judgments.

\textsuperscript{16} It should be noted that same result could obtain if $\text{RIRQ}_i$ fails to capture cross-sectional variations of the informativeness of quarterly reports. The same caveat applies to other tests of hypothesis two.
both included, as in Model 7, the size effect (\( \text{LSIZE}_{it} \times \text{UE}_{it+1} \)) remains positive and significant at the 0.10 level but the analyst following effect no longer exists.

Model 8 includes the three categorical disclosure variables at the same time, but not the size and analyst following variables. The adjusted R\(^2\) for the regression is 0.062. In contrast to results for Model 2, only the coefficients of investor relations (\( \text{RIRI}_{it} \) and \( \text{RIRI}_{it} \times \text{UE}_{it+1} \)) remain significantly positive at the 0.01 level. This suggests that only investor relations are effective in communicating information on next year’s earnings changes to the market, and the significant effects of the annual reports in Model 2 are likely to be caused by the correlation between \( \text{RIRA}_{it} \) and \( \text{RIRI}_{it} \). Model 9 adds control variables for size and analyst following to Model 8, but the results remain essentially the same. The coefficients for investor relations (\( \text{RIRI}_{it} \) and \( \text{RIRI}_{it} \times \text{UE}_{it+1} \)) are still significantly positive at the 0.01 level, indicating that the effect of investor relations on price anticipation of earnings is not caused by size or analyst following.

Results of Model 9 also indicate that none of the variables other than investor relations significantly affects the degree of one-year-ahead price anticipation of earnings, as none of the coefficients for other interaction terms is significant at the conventional levels. The size effect observed in Models 5 and 7 is no longer significant at the conventional levels. This suggests that the effect of size on firms’ information environments documented in previous studies, which do not control for the effect of disclosures, may be in part caused by the fact that larger firms tend to have better investor relations.

5.3 Sensitivity Analysis for H2

We perform sensitivity analyses in three ways. Bernard (1987) argues that in cross-sectional regressions of return on unexpected earnings, the cross-sectional dependence of returns may cause the levels of statistical significance for the regression coefficients to be overstated. To alleviate this potential problem as well as the concern that the results in Table 6 may have been affected by a small number of outliers, annual regressions based on Model 9 are repeated for each of nine sample years. Tests are based on the distributions of the coefficients across sample years. The results are essentially the same as reported in table 6, with investor relations as the only statistically significant effect.

Collins and Kothari (1989) provide evidence that the earnings response coefficient varies systematically with the book-to-market ratio and equity beta. To make certain that the results in Table 6 are not caused by the lack of control for these two variables, Model 9 with additional control variables of book-to-market ratio and equity beta is re-estimated. The results remain qualitatively the same as reported in Table 6. Finally, while the results in table 6 are based on regressions where the CRSP equal-weighted market index is used in the calculation of the cumulative market adjusted returns, they remain essentially the same when we use the value-weighted market index.

6. Conclusions

\(^{17}\) While this suggests that the previously reported size effect may be in part caused by the positive correlation between size and disclosure informativeness, the findings in this paper should be interpreted with caution because the sizes of the sample firms in our paper are much less extreme than those in Collins, Kothari, and Rayburn (1987) and Freeman (1987).
This paper examines the effects of investor communications and corporate disclosure policy on price anticipation of future earnings by addressing two interrelated research questions: (1) whether stock prices anticipate future earnings information earlier for firms with more informative disclosure policy than for firms with less informative disclosure policy, and (2) whether such price anticipation is an increasing function of the informativeness of corporate disclosures released through alternative media such as investor relations, annual reports and quarterly reports.

We find that the market-adjusted returns of firms with more informative disclosure policy start to reflect earnings changes about four months ahead of those of firms with less informative disclosure policy. The lead is statistically significant and still present after controlling for firm size and analyst following. The result is consistent with Healy and Palepu’s (1993) assertion that firm-provided disclosures constitute a unique, nonsubstitutable source of information about firms’ future performance.

We also document that the magnitude of one-year-ahead price anticipation of earnings increases in the informativeness of investor relations but does not vary systematically with the informativeness of annual and quarterly reports, analyst following, or other factors proxied by firm size. The size effect becomes insignificant when the effects of disclosures are controlled. These findings indicate that investor relations are more effective than quarterly and annual reports in communicating information on next year’s earnings to investors. The results shed light on the importance of effective investor communications (Healy and Palepu [1995]).

Our results have also potential implications for empirical studies that use either the overall disclosures (Healy, Palepu and Sweeney [1995]; Welker [1995]) or disclosures through just one media (Botosan [1997]) to examine the effects of voluntary disclosures on capital market variables, such as liquidity and cost of equity capital. Results reported in this paper suggest that the previously reported effects of voluntary disclosures on capital market variables could be in part driven by disclosures through investor relations, instead of accounting disclosures through quarterly and annual reports. Such a distinction is important for policy makers such as the FASB and SEC, who are attempting to assess the effectiveness of mandatory (accounting) disclosures.

On the other hand, our findings in this paper should also be interpreted with caution. First of all, we use analysts’ evaluation scores released through the AIMR Reports to develop proxies for the informativeness of disclosures. The underlying assumption is that these scores can capture within-industry variation of firms’ disclosure practices. The interpretation of our results is subject to this assumption. Second, managers’ disclosure choices are likely to be endogenous and affected by investors’ demand for information. Even though the potential effects of exchange membership, fiscal year-end, industry membership, size, analyst following, beta, and book-to-market ratio are controlled through sample selection and/or research design, it is possible that some correlated variables are still missing from the analysis.
REFERENCES


FIGURE 1. Average Cumulative Market Adjusted Returns (CMR) for Low-Disclosure (LD) and High-Disclosure (HD) Portfolios

This figure 1 graphs the intertemporal averages of cumulative market-adjusted returns from the beginning of year $t$, the year in which the disclosures are made, to April of year $t+2$, separately for LD and HD hedge portfolios. For each sample year $t$, hedge portfolios are constructed separately for HD and LD firms by taking long positions in firms with $UE_{it+1} > 0$, and short positions in firms with $UE_{it+1} < 0$. Equal weights are given to firms within the same news groups.
Table 1 Sample Selection Criteria and Procedure

Panel A: Sample selection

<table>
<thead>
<tr>
<th>Condition</th>
<th>Number of Firm-years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm-years covered in AIMR Reports, 1983-1991</td>
<td>4,390</td>
</tr>
<tr>
<td>Less firm-years</td>
<td></td>
</tr>
<tr>
<td>without CUSIP numbers identifiable from CRSP tapes</td>
<td>(168)</td>
</tr>
<tr>
<td>with Compustat data missing</td>
<td>(408)</td>
</tr>
<tr>
<td>with at least one monthly return missing from the first month of year t</td>
<td>(1,036)</td>
</tr>
<tr>
<td>to the last month of year t+2 from CRSP monthly return files for NYSE</td>
<td></td>
</tr>
<tr>
<td>firms</td>
<td></td>
</tr>
<tr>
<td>with analyst following data missing</td>
<td>(276)</td>
</tr>
<tr>
<td>with scaled unexpected earnings larger than one</td>
<td>(18)</td>
</tr>
<tr>
<td>with non-December 31 fiscal year ends</td>
<td>(564)</td>
</tr>
<tr>
<td>without the AIMR category scores</td>
<td>(532)</td>
</tr>
<tr>
<td>with less than three firms in annual industry groups</td>
<td>(39)</td>
</tr>
<tr>
<td>Firm-years included in the sample</td>
<td>1,349</td>
</tr>
</tbody>
</table>

Panel B: Distribution of sample firms by year and industries

<table>
<thead>
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<th>Year</th>
<th>Number of firms in the sample</th>
<th>Number of industries in the sample</th>
</tr>
</thead>
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<tr>
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<tr>
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<td>1985</td>
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<td>1986</td>
<td>109</td>
<td>14</td>
</tr>
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<td>1987</td>
<td>128</td>
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<td>1989</td>
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<td>1990</td>
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<td>1991</td>
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</tr>
<tr>
<td>Totals</td>
<td>1,349</td>
<td>175</td>
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</tbody>
</table>
The AIMR Reports are the Association for Investment Management and Research Corporate Information Committee Reports.

### Table 2. Sample Summary Statistics

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std.Dev.</th>
<th>1%</th>
<th>25%</th>
<th>50%</th>
<th>75%</th>
<th>99%</th>
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</thead>
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<tr>
<td>ANA&lt;sub&gt;it&lt;/sub&gt;</td>
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<td>9.20</td>
<td>4</td>
<td>14</td>
<td>21</td>
<td>27</td>
<td>43</td>
</tr>
<tr>
<td>SIZE&lt;sub&gt;it&lt;/sub&gt;</td>
<td>1,349</td>
<td>4,670</td>
<td>7,874</td>
<td>114</td>
<td>895</td>
<td>2,140</td>
<td>4,929</td>
<td>41,546</td>
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<tr>
<td>UE&lt;sub&gt;it+1&lt;/sub&gt;</td>
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<td>0.106</td>
<td>-0.389</td>
<td>-0.029</td>
<td>0.005</td>
<td>0.021</td>
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</tr>
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<td>BM&lt;sub&gt;it&lt;/sub&gt;</td>
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<td>0.375</td>
<td>0.027</td>
<td>0.423</td>
<td>0.627</td>
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<td>1.632</td>
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<tr>
<td>BETA&lt;sub&gt;it&lt;/sub&gt;</td>
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<td>0.303</td>
<td>0.403</td>
<td>0.816</td>
<td>1.019</td>
<td>1.195</td>
<td>1.853</td>
</tr>
</tbody>
</table>

ANA<sub>it</sub> = the total number of forecasts made by analysts for EPS<sub>i</sub> of firm i in year t,

SIZE<sub>it</sub> = the market value of the firm at the beginning of year t, in millions of dollars,

UE<sub>it+1</sub> = unexpected earnings for firm i in year t+1, obtained by subtracting primary earnings per share before extraordinary items and discontinued operations of year t from that of year t+1 and then scaling the difference by share price at the beginning of year t+1,

BM<sub>it</sub> = the book value of the firm i divided by the market value at the beginning of year t,

BETA<sub>it</sub> = beta of common stock calculated by regressing monthly returns on the NYSE equally weighted monthly index, at the beginning of year t.
Table 3. Pearson (Lower Triangular) and Spearman (Upper Triangular) Correlation Coefficients between the Proxies for the Informativeness of Disclosures and Control Variables

<table>
<thead>
<tr>
<th></th>
<th>ANA_{it}</th>
<th>LSIZE_{it}</th>
<th>UE_{it+1}</th>
<th>RIRT_{it}</th>
<th>RIRA_{it}</th>
<th>RIRQ_{it}</th>
<th>RIRI_{it}</th>
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<tr>
<td>ANA_{it}</td>
<td>0.7500</td>
<td>0.0167</td>
<td>0.1296</td>
<td>0.1174</td>
<td>0.0922</td>
<td>0.1299</td>
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<tr>
<td></td>
<td>0.0001</td>
<td>0.5395</td>
<td>0.0001</td>
<td>0.0001</td>
<td>0.0007</td>
<td>0.0001</td>
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<tr>
<td>LSIZE_{it}</td>
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<td>0.0983</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>0.0001</td>
<td>0.8046</td>
<td>0.0028</td>
<td>0.0003</td>
<td>0.4346</td>
<td>0.0001</td>
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<tr>
<td>UE_{it+1}</td>
<td>0.0193</td>
<td>0.0269</td>
<td>0.0439</td>
<td>0.0357</td>
<td>0.0246</td>
<td>0.0460</td>
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<tr>
<td></td>
<td>0.4792</td>
<td>0.3233</td>
<td>0.1075</td>
<td>0.1899</td>
<td>0.3674</td>
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<tr>
<td>RIRT_{it}</td>
<td>0.1177</td>
<td>0.0946</td>
<td>0.0211</td>
<td>0.8143</td>
<td>0.7684</td>
<td>0.7096</td>
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<td></td>
<td>0.0001</td>
<td>0.0005</td>
<td>0.4398</td>
<td>0.0001</td>
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<td></td>
</tr>
<tr>
<td>RIRA_{it}</td>
<td>0.1124</td>
<td>0.1144</td>
<td>0.0267</td>
<td>0.8143</td>
<td>0.6043</td>
<td>0.4881</td>
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<td></td>
<td>0.0001</td>
<td>0.0001</td>
<td>0.3266</td>
<td>0.0001</td>
<td>0.0001</td>
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<tr>
<td>RIRQ_{it}</td>
<td>0.0880</td>
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<td>0.0068</td>
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<td>0.4462</td>
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<td></td>
<td>0.0012</td>
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<td>RIRI_{it}</td>
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<td>0.8342</td>
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<td>0.0001</td>
<td>0.0001</td>
<td></td>
</tr>
</tbody>
</table>

Listed below each correlation coefficient is the p value. Number of observations is 1,349.

ANA_{it} = the total number of forecasts made by analysts for EPS_{it} of firm i in year t,

LSIZE_{it} = the logarithm of the market value of firm i at the beginning of year t,

UE_{it+1} = unexpected earnings for firm i in year t+1, obtained by subtracting primary earnings per share before extraordinary items and discontinued operations of year t from that of year t+1 and then scaling the difference by share price at the beginning of year t+1,

RIRT_{it} = relative industry ranking (RIR) of overall disclosure informativeness for firm i in year t,

RIRA_{it} = RIR of the informativeness of disclosures via annual reports for firm i in year t,

RIRQ_{it} = RIR of the informativeness of disclosures via quarterly reports for firm i in year t,

RIRI_{it} = RIR of the informativeness of disclosures via investor relations for firm i in year t.
Table 4 Earnings Response Coefficients from Regressing Cumulative Market Adjusted Returns in a Moving Six-Month Window on Future Unexpected Earnings, for the Low Disclosure (LD) and High Disclosure (HD) Portfolios

\[
CMR_{itn} = \alpha_{tn} + \beta_{tn} UE_{it+t+\epsilon_{tn}}
\]

<table>
<thead>
<tr>
<th>n</th>
<th>LD</th>
<th>HD</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\beta_n$</td>
<td>Std. Err.</td>
<td>t</td>
<td>$\beta_n$</td>
<td>Std. Err.</td>
<td>t</td>
</tr>
<tr>
<td>0</td>
<td>-0.2015</td>
<td>0.0698</td>
<td>-2.8850</td>
<td>-0.0926</td>
<td>0.0890</td>
<td>-1.0410</td>
</tr>
<tr>
<td>1</td>
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<td>-2.7170</td>
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<td>-1.4140</td>
</tr>
<tr>
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<td>0.0827</td>
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</tr>
<tr>
<td>4</td>
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<td>0.1011</td>
<td>0.0850</td>
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<tr>
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<td>-1.1380</td>
<td>0.1424</td>
<td>0.0788</td>
<td>1.8070</td>
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<tr>
<td>7</td>
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<td>-0.0260</td>
<td>0.1347</td>
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</tr>
<tr>
<td>8</td>
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<td>0.0715</td>
<td>0.5940</td>
<td>0.1931</td>
<td>0.0807</td>
<td>2.3950</td>
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<tr>
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<tr>
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<tr>
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<td>3.7260*</td>
<td>0.1219</td>
<td>0.0899</td>
<td>1.3560</td>
</tr>
</tbody>
</table>

a. Significantly positive with a $p$-value of 0.05 or smaller, one-sided.

The beginning of each six-month window period is indexed by $n$, months since the beginning of year $t$. Observations in all sample years are pooled together. The number of observation is 447 for both the LD and HD portfolios, respectively.
Table 5. Results of $t$ and Wilcoxon Signed Rank Tests on the Lead of Price Anticipation of Earnings of High-Disclosure (HD) Firms over Low-Disclosure (LD) Firms

<table>
<thead>
<tr>
<th>Year</th>
<th>$n_{t}^{LD}$</th>
<th>$n_{t}^{HD}$</th>
<th>$n_{t}^{LD} - n_{t}^{HD}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>83</td>
<td>9</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>84</td>
<td>6</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>85</td>
<td>14</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>86</td>
<td>12</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>87</td>
<td>10</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>88</td>
<td>9</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>89</td>
<td>14</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>90</td>
<td>2</td>
<td>10</td>
<td>-8</td>
</tr>
<tr>
<td>91</td>
<td>10</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Average</td>
<td>9.56</td>
<td>5.22</td>
<td>4.34$^a$</td>
</tr>
</tbody>
</table>

Sum of Signed Ranks - - 37.5$^a$

a. Significantly positive with a p-value of 0.05 or smaller, one-sided.

The regression, $CMR_{itn} = \alpha_{it} + \beta_{it}UE_{i,t+1} + \epsilon_{itn}$, is first estimated separately for LD and HD firms for each sample year $t$. $CMR_{itn}$ is cumulative market-adjusted returns for firm $i$ in year $t$ over a six-month moving window, and $UE_{i,t+1}$ is unexpected future earnings. The start of the moving windows is indexed by $n$, which can take a value between 0 (the beginning of year $t$) to 24 (the end of year $t+1$). The first $n$ value for which $\beta_{it}$ is statistically positive at the 0.05 level (one-sided) is then identified for each year and noted as $n_{t}^{HD}$ for the HD firms and $n_{t}^{LD}$ for LD firms respectively.
Table 6. Regression Results for the Effect on Price Anticipation of Earnings by Different Disclosure Channels

\[
CMR_{it} = \alpha + \sum_{i=0}^{91} \delta_i D_{it} + \delta_1 RIRA_{it} + \delta_2 RIRQ_{it} + \delta_3 RIRI_{it} + \delta_4 LSIZE_{it} + \delta_5 ANA_{it} + \beta_1 UE_{it+1} + \beta_2 RIRA_{it} * UE_{it+1} \\
+ \beta_3 RIRQ_{it} * UE_{it+1} + \beta_4 RIRI_{it} * UE_{it+1} + \beta_5 LSIZE_{it} * UE_{it+1} + \beta_6 ANA_{it} * UE_{it+1} + \epsilon_{it},
\]

<table>
<thead>
<tr>
<th>Models</th>
<th>Coefficient</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIRA_{it}</td>
<td>-0.040</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.005</td>
<td>0.002</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2.21)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.19)</td>
<td>(0.09)</td>
<td></td>
</tr>
<tr>
<td>RIRQ_{it}</td>
<td>-0.027</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-0.022</td>
<td>-0.020</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.47)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(-0.93)</td>
<td>(-0.86)</td>
<td></td>
</tr>
<tr>
<td>RIRI_{it}</td>
<td>0.095</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.101</td>
<td>0.100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(5.24)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(4.78)</td>
<td>(4.68)</td>
<td></td>
</tr>
<tr>
<td>LSIZE_{it}</td>
<td>-0.009</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.86)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1.18)</td>
<td>(0.92)</td>
<td></td>
</tr>
<tr>
<td>ANA_{it}</td>
<td>-0.001</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-0.000</td>
<td>-0.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.42)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.08)</td>
<td>(0.06)</td>
<td></td>
</tr>
<tr>
<td>UE_{it}</td>
<td>0.285</td>
<td>0.124</td>
<td>0.194</td>
<td>-0.043</td>
<td>-0.437</td>
<td>0.081</td>
<td>-0.478</td>
<td>0.017</td>
<td>-0.558</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(4.9)</td>
<td>(1.3)</td>
<td>(1.8)</td>
<td>(-0.4)</td>
<td>(-1.6)</td>
<td>(0.6)</td>
<td>(-1.5)</td>
<td>(0.1)</td>
<td>(-1.7)</td>
<td></td>
</tr>
<tr>
<td>RIRA_{it} * UE_{it+1}</td>
<td>0.416</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.212</td>
<td>0.161</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2.30)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.85)</td>
<td>(0.64)</td>
<td></td>
</tr>
<tr>
<td>RIRQ_{it} * UE_{it+1}</td>
<td>0.207</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-0.338</td>
<td>-0.303</td>
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<td></td>
<td>(1.0)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>(-1.2)</td>
<td>(-1.1)</td>
<td></td>
</tr>
<tr>
<td>RIRI_{it} * UE_{it+1}</td>
<td>0.756</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.774</td>
<td>0.740</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(4.1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(3.5)</td>
<td>(3.4)</td>
<td></td>
</tr>
<tr>
<td>LSIZE_{it} * UE_{it+1}</td>
<td>0.109</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.122</td>
<td>0.092</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2.6)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1.9)</td>
<td>(1.4)</td>
<td></td>
</tr>
<tr>
<td>ANA_{it} * UE_{it+1}</td>
<td>-0.012</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-0.003</td>
<td>-0.001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(-0.2)</td>
<td>(-0.1)</td>
<td></td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.034</td>
<td>0.040</td>
<td>0.034</td>
<td>0.063</td>
<td>0.040</td>
<td>0.036</td>
<td>0.038</td>
<td>0.062</td>
<td>0.063</td>
<td></td>
</tr>
</tbody>
</table>
The Role of Investor Communications and Corporate Disclosure Policy on Price Anticipation of Earnings

Table 6 (Continued)

a. Significantly positive with a p-value of 0.01 or smaller, two-sided.
b. Significantly positive with a p-value of 0.05 or smaller, two-sided.
c. Significantly positive with a p-value of 0.10 or smaller, two-sided.

Observations are pooled both cross-sectionally and intertemporally. Both regression coefficients and t-statistics (in brackets) are reported. Those for the intercept and annual dummies are not reported for parsimony. Results from other models are included for discussions and comparisons.

\[
\begin{align*}
\text{CMR}_{it} &= \text{cumulative market adjusted return}, \\
\text{UE}_{it+1} &= \text{unexpected earnings for firm } i \text{ in year } t+1, \text{ obtained by subtracting primary earnings per share before extraordinary items and discontinued operations of year } t \text{ from that of year } t+1 \text{ and then scaling the difference by share price at the beginning of year } t+1, \\
\text{RIRA}_{it} &= \text{relative industry rankings for the informativeness of the annual reports}, \\
\text{RIRQ}_{it} &= \text{relative industry rankings for the informativeness of the quarterly reports}, \\
\text{RIRI}_{it} &= \text{relative industry rankings for the informativeness of investor relations}, \\
\text{LSIZE}_{it} &= \text{the logarithm of the market value of the firm at the beginning of year } t, \\
\text{ANA}_{it} &= \text{the total number of forecasts made by analysts for EPS}_{it} \text{ of firm } i \text{ in year } t.
\end{align*}
\]
APPENDIX 1

Criteria of the AIMR’s Corporate Information Committee
For Evaluating Firms’ Financial Communications Effort

Qualification Questions
(Mandatory for each subcommittee's evaluation form)

1. To your knowledge, during the past year has the management of this company suppressed or misrepresented material facts adverse to the company and / or its operations or outlook?
2. In your opinion, are any accounting or other managerial practices of this company materially misleading?
3. In your opinion, is this company unduly dilatory with respect to its press releases and / or earnings statements?

If you have answered any of these questions in the affirmative, do not proceed with the rating of this company but contact the subcommittee chair. An affirmative answer to one of the questions by two or more subcommittee members will disqualify the company from being considered in this year's rating.

Note: The percentage weights appearing after each major category title (below) can be distributed to subcategories in whatever manner seems appropriate to each subcommittee.

Annual Published Information
(40-50 percent of total weight)
A. Annual Report
   1. Financial Highlights: Are they clear and unambiguous?
   2. President's Letter Review: Does it hit the highlights of the year in an objective manner? Is it relevant to the company's results and candid in appraising problems? It should include:
      a. Review of the year.
      b. Insights into operating rates, unit production levels, and selling prices.
      c. Acquisitions and divestments, if any.
      d. Government business, if material.
      e. Capital expenditures program; start-up expenses.
      f. Research and development efforts.
      g. Employment costs, labor relations, union contracts.
      h. Energy cost and availability.
      i. Environmental and OSHA costs.
      j. Backlogs.
      k. New products.
      l. Legislative and regulatory developments.
      m. Outlook.
      n. Unusual income or expense.
   3. Officers and Directors:
      a. Age, background, and responsibilities.
      b. Description of company organization.
      c. Outside affiliations of directors.
      d. Principal personnel changes.
   4. Statement of Corporate Goals:
What are the short-term and long-term corporate goals, and how and when does management expect to achieve them? (This section could be included in several areas of the report, but separate treatment is preferred.)

5. Discussions of Divisional and/or Segment Operations:
   a. How complete is the breakdown of sales, materials, costs, overhead, and earnings?
   b. Are the segments logical for analytical purposes? Do they parallel lines of business?
   c. Are unusual developments explained, and do the explanations include management’s response?
   d. Comparisons with relevant industry developments should include:
      i. Market size and growth.
      ii. Market penetration.
      iii. Geographical divergencies.
   e. Foreign operations:
      i. Revenues, including export sales.
      ii. Consolidated foreign earnings versus equity interest.
      iii. Market and/or regional trends.
      iv. Tax status.

6. Financial Summary and Footnotes:
   a. Statement of accounting principles, including explanation of changes and their effects.
   b. Adjustments to EPS for dilution.
   c. Affiliates’ operating information.
   d. Consolidated finance subsidiary’s disclosure of separate balance sheet information and operating results.
   e. Cash flow statement (FAS No. 95).
   f. Tax accounting investment tax credits identified, breakdown of current and deferred taxes for U.S. and non-U.S. tax jurisdictions, reconciliation of effective and statutory tax rates, impact of changes in tax law, early application of FAS No. 96.
   g. Clarity of explanation of currency exchange rate accounting:
      i. Impact on earnings from Balance Sheet translation, if any.
      ii. Indication of "Operating" or Income Statement Effect of exchange rate fluctuations.
   h. Property accounts and depreciation policies:
      i. Methods and asset lives used for tax and for financial reporting.
      ii. Quantification of effect on reported earnings of use of different method and/or asset lives for tax purposes.
   i. Investments: composition and market values disclosed.
   j. Inventories: method of valuation and identifying different methods for various product or geographic segments.
   k. Leases and rentals: terms and liability.
   l. Debt repayment schedules.
   m. Pension funds: costs charged to income, interest rate, and wage-inflation assumptions; amount of any unfunded past service liability; amortization period for unfunded liability (FAS No. 87).
   n. Other postemployment benefits: pay-as-you-go amount, discussion of potential liability, impact of FAS No. 106, including plans to fund or amend, and impact of FAS No. 112.
   o. Capital expenditure programs and forecasts, including costs for environmental purposes.
   p. Acquisitions and divestitures (if material):
      i. Description of activity and operating results.
ii. Type of financial transaction.
iii. Effect on reported sales and earnings.
iv. Quantification of purchase acquisitions or small poolings that do not require restatement of prior years' results. (When restating for pooling, both old and new data are useful for comparison.)
q. Year-end adjustments.
r. Restatement of quarterly reports to year-end accounting basis.
s. Research and development and new products; amount and types of outlays and forecasts.
t. Contingent liabilities, particularly environmental.
u. Derivation of number of shares used for calculating primary and fully diluted earnings per share.
v. Disclosures of the fair values of financial instruments (FAS No. 107).
w. Goodwill amount being amortized and number of years.
x. Ten-year statistical summary.
  i. Adequacy of income statement and balance sheet detail.
  ii. Helpfulness of ‘nonstatement’ data (e.g., number of employees, adjusted number of shares, price of stock, capital expenditures, etc.)

B. 10-Ks, 10-Qs, and Other Required Published Information

**Quarterly and Other Published Information Not Required**
(30-40 percent of total weight)

A. Quarterly Report
1. Depth of commentary on operating results and developments.
2. Discussion of new products, management changes, and problem areas.
3. Degree of detail of profit and loss statement, including divisional or segmental breakdown.
5. Restatement of all prior- and current-year quarters for major pooling acquisitions and quantification of effect of purchase acquisitions and/or disposals.
6. Breakout of nonrecurring or exceptional income or expense items, including effects from inventory valuation and foreign currency translation factors.
8. Timeliness of reports.
9. Separate fourth quarter report.

B. Other Published Material
1. Availability of proxy statements (even though this is required public information).
2. Annual meeting report: available with questions and answers and identify of those posing questions.
3. Addresses to analysts' groups: available with questions and answers.
5. Company magazines, newsletters, and explanatory pamphlets.
6. Press releases: Are they sent to shareholders and analysts? Are they timely? Do they include earnings numbers?
7. How are documents filed with public agencies (SEC, Federal Trade commission, Department of Labor, court cases, etc.) made available? Does the company disseminate all material information in 10-K, 10-Q, and similar reports?
Other Aspects
(20-30 percent of total weight)
A. Is there a designated and advertised individual (or individuals) for shareholder and analyst contacts?
B. Interviews
   1. Knowledgeability and responsiveness of company contact.
   2. Access to policymakers and operational people.
   3. Candor in discussing negative developments.
C. Presentations to analyst groups: frequency and content
D. Company-sponsored filed trips and meetings
E. Annual meetings
   1. Accessibility.
   2. Worthwhile to shareholders and analysts.
APPENDIX 2

Evaluation Scores by the Machinery Subcommittee of the AIMR’s Corporate Information Committee, 1991-92

<table>
<thead>
<tr>
<th></th>
<th>Annual Report (40%)</th>
<th>Quarterly Material (30%)</th>
<th>Investor Relations &amp; Other (30%)</th>
<th>Total</th>
<th>Rank (Total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dover Corporation</td>
<td>36.7</td>
<td>27.0</td>
<td>23.3</td>
<td>87.0</td>
<td>1</td>
</tr>
<tr>
<td>Ingersoll-Rand Company</td>
<td>33.5</td>
<td>26.5</td>
<td>25.8</td>
<td>85.8</td>
<td>2</td>
</tr>
<tr>
<td>Cummins Engine Company</td>
<td>35.0</td>
<td>24.0</td>
<td>26.5</td>
<td>85.5</td>
<td>3</td>
</tr>
<tr>
<td>IRINOVA Corporation</td>
<td>35.0</td>
<td>26.3</td>
<td>23.0</td>
<td>84.3</td>
<td>4</td>
</tr>
<tr>
<td>Parker Hannifin Corporation</td>
<td>35.8</td>
<td>22.3</td>
<td>23.8</td>
<td>81.9</td>
<td>5</td>
</tr>
<tr>
<td>Giddings &amp; Lewis, Inc.</td>
<td>30.0</td>
<td>23.0</td>
<td>28.0</td>
<td>81.0</td>
<td>6</td>
</tr>
<tr>
<td>Hamaschfeger Industries</td>
<td>26.5</td>
<td>28.5</td>
<td>24.0</td>
<td>79.0</td>
<td>7</td>
</tr>
<tr>
<td>Caterpillar, Inc.</td>
<td>32.8</td>
<td>21.0</td>
<td>21.8</td>
<td>75.6</td>
<td>8</td>
</tr>
<tr>
<td>Navistar International Corp.</td>
<td>27.0</td>
<td>24.0</td>
<td>23.7</td>
<td>74.7</td>
<td>9</td>
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<tr>
<td>Kennametal, Inc.</td>
<td>26.0</td>
<td>21.0</td>
<td>25.0</td>
<td>72.0</td>
<td>10</td>
</tr>
<tr>
<td>Cincinnati Milacron, Inc.</td>
<td>24.8</td>
<td>18.2</td>
<td>28.5</td>
<td>71.5</td>
<td>11</td>
</tr>
<tr>
<td>Deere &amp; Company</td>
<td>28.2</td>
<td>21.5</td>
<td>20.8</td>
<td>70.5</td>
<td>12</td>
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<td>Varity Corporation</td>
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<td>22.0</td>
<td>16.0</td>
<td>65.5</td>
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<tr>
<td>Clark Equipment Company</td>
<td>25.0</td>
<td>21.5</td>
<td>18.5</td>
<td>65.0</td>
<td>14</td>
</tr>
<tr>
<td>PACCAR, Inc.</td>
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<td>19.7</td>
<td>13.0</td>
<td>56.7</td>
<td>15</td>
</tr>
<tr>
<td>Briggs &amp; Stratton Corp.</td>
<td>24.0</td>
<td>15.0</td>
<td>13.0</td>
<td>52.0</td>
<td>16</td>
</tr>
</tbody>
</table>

Average 26.1 22.6 22.2 70.9

The following example illustrates the calculation of the relative industry rankings. The rankings for Caterpillar in Total, Annual Report, Quarterly Material, and Investor Relations & Other are respectively, 8th, 6th, 12th, and 11th, with 1st being the best. Alternatively, since there are 16 firms in the machinery industry for 1991, the rankings can be redefined as 9th, 11th, 5th, and 6th, with 16th being the best. Therefore, the relative industry rankings for Caterpillar in fiscal year 1991 are:

\[
\text{RIRT} = \frac{(9-1)}{(16-1)} = 0.533; \\
\text{RIRA} = \frac{(11-1)}{(16-1)} = 0.667; \\
\text{RIRQ} = \frac{(5-1)}{(16-1)} = 0.267; \\
\text{RIRI} = \frac{(6-1)}{(16-1)} = 0.250.
\]