Accounting Earnings Announcements, Institutional Investor Concentration, and Common Stock Returns

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1. Introduction

This study examines the relation between the level of institutional investor ownership and the magnitude of security price variability at quarterly earnings announcement dates. Prior research consistently documents a negative association between firm size and announcement-date return variability. One explanation for this finding is that as more timely, alternative information becomes available on large firms prior to an announcement date, their security prices become informative, thereby reducing the information content of the earnings announcement. Large firms are closely followed by institutional investors. These investors dedicate substantial resources to information search. Therefore, the link between size and information production may be attributable to the influence of institutional investors on the information production process.[1] Because institutional trades can also affect security prices, however, the precise impact of institutional following on the variability of prices at quarterly earnings dates is not evident.

Evidence obtained principally from a cross-sectional regression of announcement-date stock price variability on firm size, earnings response coefficients, earnings variability, and the percentage of institutional holdings indicates that the degree of price variability at quarterly announcement dates increases with the level of institutional investor ownership. This result suggests that the alternative information gathered by institutions is unlikely to preempt that conveyed by the quarterly earnings announcement.

The sample selection criteria and variable definitions are described in section 2. Section 3 presents the descriptive data and the results of the empirical tests. Concluding remarks are presented in section 4.

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[1] Atiase [1985] and Zeghal [1984] find that the returns of small firms during announcement periods are on average more variable than the announcement-period returns of large firms. Freeman [1987] reports that the prices of large firms reflect the information content of an upcoming earnings report earlier than the prices of small firms. These results are consistent with the view that the amount of firm-specific private information production and dissemination activities is positively correlated with firm size. The *Report of the Advisory Committee on Corporate Disclosure* (SEC [1977]) and *The Institutional Investor Study Report* (SEC [1971]), *IISR,* document that institutional investors dedicate significant resources to information production and tend to concentrate their holdings in large firms. O'Brien and Bhushan [1990] find strong positive correlations between security analyst following, institutional investors, and firm size. Moreover, they find that decisions of analysts to follow firms may be accompanied by simultaneous decisions of institutions to adjust their holdings commensurate with size changes.

2. Description of Sample and Variable Definitions

Sample firms met the following criteria: (1) listed on the NYSE during 1979-85, (2) daily *CRSP* return data and quarterly *Compustat* earnings announcement dates for the fiscal years 1979-85, and (3) quarterly earnings per share on *Compustat* from 1976-85. Six hundred fifty-eight firms met the criteria. 1979 is chosen as the beginning year because mandatory reporting of institutional holdings begins on this date. Requiring data from 1979 through 1985, the most restrictive criterion, ensures a long enough time series to estimate some of the variables used in the study; results are similar when this requirement is relaxed.

Institutional concentration, *PIH*, is measured as the percentage of a firm's outstanding common shares held by institutional investors at the beginning of a calendar year. This information is hand-collected for 1979, 1981, 1983, and 1985 from *Spectrum 3*.[2] Size, *MV*, is defined as the market value of common equity at the beginning of the fiscal quarter.

Forecasted quarterly earnings for each firm and quarter are estimated from Foster's [1977] univariate time-series model[3] using the previous 12 quarterly earnings observations:

$$E\left[EPS_{iq}\right] = EPS_{iq-4} + \delta_{i1} + \delta_{i2}\left[EPS_{iq-1} - EPS_{iq-5}\right],$$

where:

$\boldsymbol{EPS_{iq}}$ = earnings per share of firm *i* in quarter *q*.

A forecast error, FE_{iq}, is constructed as $FE_{iq} = EPS_{iq} - E[EPS_{iq}]$, A standard deviation of quarterly earnings, a_{FEiq}, is also constructed using the error terms from the estimation periods.

Residual returns are computed as:

$$u_{it} = R_{it} - \left(\hat{\alpha}_i + \hat{\beta}_i R_{mt}\right),$$

where:

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[2] Firms not listed in the *Spectrum 3* publication but meeting the other criteria are included in the sample and defined as having no institutional holdings. Virtually all NYSE firms are held by institutions and therefore are in *Spectrum 3.* Since 12/31/78, Securities Act Rule 13f-l requires all institutional investment managers with discretion over equity accounts exceeding $100 million to disclose their holdings. This information is compiled in the *Spectrum* publication published quarterly by Computer Directions Advisors. *Value Line* and *Disclosure* report summary *Spectrum* information.

[3] Results (not reported) based on *IBES* forecasts (where available) and on forecasts from seasonal random walk model with a drift are not substantively different.

R_{it} = return on security *i* over the two-day period *t*,

R_{mt} = equally weighted market return over the two-day period *t*,

a_i, $ß_i$ = parameters, estimated using 100 two-day returns prior to and 100 two-day returns immediately following the 60-day period ending with the quarterly earnings announcement.

The announcement period, $t = 0$, is the *Compustat* earnings announcement day and the trading day immediately preceding it. A 60-day quarterly return, QR_{iq}, is computed as $QR_{iq} = \sum_{t=-29}^{0} u_{it}$, where $t = -29, -28 \ldots 0$ denotes successive two-day intervals.

An earnings response coefficient, EC_i, is estimated over the 28 firm-quarters: $QR_{iq} = a_i + EC_i (FE_{iq}/P_{iq-1}) + z_{iq}$, where P_{iq-1} = the stock price at the beginning of the quarter *q*.

Announcement-period return variability is measured following Patell [1976]:[4]

$$U_{iq} = \left(u_{i0}^2\right)/\left(S_{i0}^2\right)*\left(T_i - 4\right)/\left(T_i - 2\right),$$

where:

u_{i0} = announcement-period residual return,
S_{i0}^2 = estimated variance of residual during announcement period,
T_i = number of observations in the estimation period.

An average *U* statistic is then computed for each firm as:

$$U_i = \frac{1}{28} \sum_{q=1}^{28} U_{iq}.$$

3. Results

Table 1 displays the total equity market value, *MV*, of the sample firms and the amount held by institutional investors (funds) at the beginning of 1979, 1981, 1983, and 1985. The percentage of the sample's market value owned by institutional investors increases from 34.4% in 1979 to 45.5% in 1985. Positive correlations between the natural log of market value (In *MV)* and the percentage of fund holdings (*PIH*) are consistent with previous research that documents institutions' tendency

[4] For purposes of computing the U statistic the return parameters a_i, and $ß_i$ estimated using the 129 two-day returns preceding, and the 100 two-day returns immediately following, the announcement.

to invest in large firms.

Panel A of table 2 provides summary data on the variables examined in this study. Firm-specific measures of market value, institutional holdings, and earnings varability are constructed by averaging the time series of observations over the 1979-85 period. The mean *U* statistic of 1.63 is consistent with previous studies that document increased return

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Insert Table 1 Here

Insert Table 2 Here

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variability during announcement periods. The market value data indicate sample firms are large, with a median market value of $495 million, and with substantial variation in both market value and percentage institutional holdings across firms. The institutional holdings range from 1.8% to 75.8% of the common equity value of sample firms. The average quarterly standard deviation of earnings, a_{FEi}, and the earnings coefficients, EC_i, statistics also display considerable cross-sectional variation. These latter statistics are comparable to those reported in Lipe [1990], estimated with annual data. A Kolmogorov test (not reported) rejects the normality of each distribution. Therefore, the natural log of the variables is reported in the work presented below.[5]

Panel B of table 2 presents the pairwise Pearson correlations for the logged variables. The negative correlation between market value and announcement-period variability is consistent with previous studies which document an inverse relationship between firm size and the variability of stock prices at earnings dates. The percentage of institutional holdings is positively related to *U*. Earnings variability, a_{FEi}, is positively related to announcement-period return variability. This relation is similar to Pincus [1983] who finds that earnings predictability (the inverse of variability)

[5] If the earnings coefficient is negative, the log is taken of the absolute value of *EC,*. The parameters in the regression tests in table 3 are also estimated using the ranks of the variables, with no substantive differences in results.

is negatively related to announcement-period return variability over interim periods. Lastly, the earnings coefficients, EC_i, are negatively related to U.[6]

Table 3 displays the estimated coefficients and their absolute 7-statistics from the cross-sectional linear regressions relating the firm-specific announcement variability U statistic to predictor variables. The results from the regression

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Insert Table 3 Here

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which includes only *MV* and *PIH* reveal that return variability at quarterly earnings announcements decreases with size and increases with institutional concentration. These relations are consistent with the pairwise correlations reported above. The unrestricted regression includes earnings variability (a_{FEi}), earnings coefficients (EC_i), and six industry dummy variables in addition to market value and institutional concentration. Inclusion of these additional eight variables significantly increases the explanatory power of the regression $(F = 3.41, p < .001)$. The coefficients on *MV* and *PIH* remain different from zero.[7]

These results suggest it is unlikely that the alternative information gathered by institutions preempts that conveyed by the quarterly earnings announcement. This finding, however, may be sensitive to the effects of other variables not included in the analysis. Potential explanatory variables include the number of analysts following the firm (*NANAL*), its systematic *(BETA)* or unsystematic (a_{RET}) risk, the percentage of shares traded (*PTR*), the average daily number of block trades (*DBLK*), the average daily volume (*DVOL*), the average daily number of transactions *(DTNUM)*, and the average daily trade size (*DTSIZE*).[8] The association of these variables with *PIH* is examined below and in table 4.

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[6] Lipe [1990] reports similar correlations between market value, earnings predictability, and earnings coefficients using annual data for 143 NYSE firms.

[7] The sensitivity of the estimated coefficients to influential observations and multi- collinearity conditions is examined using procedures outlined in Belsley, Kuh, and Welsch [1980]. No severe multicollinearity or influential observation problems are identified. In addition, a Kolmogorov test indicates the regression residuals are normally distributed.

[8] Daily trading information is estimated from the 10/84 to 4/85 transaction data produced by Fitch, Inc.

It has been suggested in a number of studies that analyst following influences the amount of information collected on firms (Shores [1990] and Lobo and Mahmoud [1989]). The high positive correlation between analysts and institutions reported in table 4 is consistent with the belief that the information search activities of analysts are in part driven by institutional interests. This positive association, however, would suggest less stock price variability at announcement dates, not more.

Systematic and unsystematic risk are examined based on Verrecchia's [1982] finding that the informativeness of price increases with the risk tolerance of traders. There is little correlation between unsystematic risk and institutional concentration. The positive correlation between institutional holdings and systematic risk as reported by O'Brien and Bhushan [1990] suggests greater risk tolerance on the part of institutional investors rather than less, a finding inconsistent with the price variability results documented above.

Insert Table 4 Here

Verrecchia also shows that the informativeness of price increases as supply noise (the variability of the per-capita supply of the risky asset) decreases. Bhushan [1989] models supply noise as trading volume and documents that trading volume is negatively correlated with the informativeness of prices. The positive correlations between percentage trading volume (*PTR*) and institutional concentration reported here indicate that the supply noise argument is consistent with the findings of this study. Appending percentage trading to the regressions in table 3, however, has little impact on the *PIH* coefficients.[9]

Unlike the "large market" method of analysis, where the theoretical results rely on the assumption that there are numerous traders, Kyle [1989] models informed speculation with imperfect competition. In Kyle's model imperfect competition allows large traders to take into account how their own trading will affect prices; the result is that prices are less informative than prices in a market with perfect competition. The difference in informativeness is due to the

[9] The unrestricted regression in table 3 is reestimated by individually including *NANAL, BETA,* α_{RET}, and *PTR*. The addition of these variables does not explain the positive association between return variability and *PIH*.

sensitivity of market price to the trader's determined valuation.

The daily trading information presented in table 4 documents an association between institutions and trading activity. The partial correlations indicate that, after controlling for the other variables, daily trading volume (*DVOL*) is not related to *PIH* and that the number of daily trades *(DTNUM)* is negatively related to *PIH*. Transaction size (*DTSIZE*) and number of block trades (*DBLK*) are positively related to the percentage of institutional ownership. Taken together, these relations reveal that a concentration of institutional investor ownership results in fewer larger trades. To the extent that large trades affect security prices (Holthausen, Leftwich, and Mayers [1987]), imperfect competition may be more prevalent in securities owned by institutions. Under such a scenario a positive relation between return variability at earnings announcements and institutional holdings is partly due to strategic limitations on trading by institutions prior to the announcement. This behavior results in less informative prices prior to the announcement and, hence, a larger announcement-date reaction.

There are other possible explanations for the findings presented here. The results may be due to operating differences in the types of firms institutions hold. For instance, institutional investors may concentrate their ownership in high-growth and high-beta securities.[10] This study controls for the effects of earnings variability, earnings coefficients, beta, and industry. Alternatively, the results may be driven by the effects of other stockholders, such as insiders, whose ownership positions are correlated with the percentage of institutional ownership.[11]

4. Concluding Remarks

This research finds a positive association between percentage institutional ownership and

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[10] This explanation was suggested to me by the portfolio manager of a large balanced-equity fund. The *IISR* study referenced in n. 1 documented that in 1969 institutional concentration was positively related to both return on equity and beta. The sample's correlation (partial correlation) between average annual return on equity (1979-85) and *PIH* is .227 (-.023). The correlation (partial correlation) between average annual sales growth over the seven-year period and *PIH* is - .031 (- .055).

[11] This potentially confounding variable was pointed out by the referee. To provide some insight into the effects of correlated omitted variables, I compare the change in a firm's *PIH,* denoted *CPIH,* from calendar year 1979 to calendar year 1985 *(CPIH* = PIH_{85} - PIH_{19}*)* with the change in a firm's *Ü* statistic, denoted *CU,* over the same period (*CU* = U_m - U_{79}*).* The Pearson and Spearman correlations between *CU* and *CPIH* are .056 (p = .15, two-tailed) and .086 (p = .03), respectively. I also construct a two-sample mean (median) test to compare the *CU* statistics of the *20%* of firms with the largest *CPIH* against the *CU* statistics of the 20% of firms with , the smallest *CPIH.* The mean *CU* for the 20% of firms with the largest and smallest changes in *PIH* are .501 and - .254, respectively, resulting in a difference of .755 (p = .03). The median difference in *CU* is .221 (p = .09). These results are consistent with the relations documented in the body of the paper. They suggest that the association between *PIH* and *U* is not just a function of omitted correlated variables.

security price variability at quarterly earnings announcements after controlling for size. This result is consistent with the view that a concentration of institutional investor ownership reduces the informativeness of prices prior to an earnings announcement. Further research is needed to determine whether it is institutional investor presence in the information markets, the structure of institutional trading in the capital market, or some other factors not incorporated in this research design which produces this result.

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TABLE 1

Institutional Investor Percentage Holdings (PIH) and Equity Market Value (MV) of 658 NYSE Firms by Year

Year	Total *MV* (billions)	Total *MV* Held by Funds (billions)	Percentage of Sample *MV* Held by Funds	Correlation ln *MV*, *PIH*
1979	$ 551.8	$ 189.9	34.4%	.639
1981	785.6	327.3	41.6%	.610
1983	877.1	378.1	43.1%	.519
1985	1013.7	461.1	45.5%	.468

[4] For purposes of computing the U statistic the return parameters α_i and β_i are estimated using the 129 two-day returns preceding, and the 100 two-day returns immediately following, the announcement.

TABLE 2

Descriptive Statistics and Correlations of Primary Variables for 658 NYSE Firms

Panel A: Descriptive Statistics

Variable	Mean	Std. Dev.	Percentiles				
			MIN	25%	50%	75%	*MAX*
U_i	1.632	.820	.336	1.076	1.431	1.979	6.294
MV_i	1.277	3.317	.010	.191	.495	1.197	53.688
PIH_i	.318	.164	.018	.186	.316	.441	.758
σ_{FEi}	.309	.643	.005	.077	.153	.299	9.964
EC_i	1.537	5.653	−16.833	−.177	.561	1.975	72.892

Panel B: Correlations

	ln U_i	ln MV_i	ln PIH_i	ln σ_{FEi}	ln EC_i
ln U_i	1.000				
ln MV_i	−.189*	1.000			
ln PIH_i	.058	.563*	1.000		
ln σ_{FEi}	.096*	−.124*	−.103*	1.000	
ln EC_i	−.051	.189*	.154*	−.586*	1.000

*Significant at 5%, two-tailed.

U_i = ratio of the two-day return variance at the quarterly announcement date to the average two-day non-announcement-period return variance, averaged over 28 quarters, 1979–85.

MV_i = common equity market value in billions, computed by averaging 28 quarterly market values during 1979–85.

PIH_i = average percentage of a firm's outstanding common shares held by institutions during 1979–85.

σ_{FEi} = the standard deviation of the time series of the firm's quarterly earnings.

EC_i = the quarterly earnings coefficient for the firm estimated over the 1979–85 period.

TABLE 3

Association Between Earnings Announcement Return Variability (U_i) and Measures of Institutional Holdings in 658 NYSE Firms, 1979–85

$$\ln U_i = \beta_0 + \beta_1 \ln MV_i + \beta_2 \ln PIH_i + \beta_3 \ln \sigma_{FEi} + \beta_4 \ln EC_i + \sum_{j=1}^{7} \gamma_{ij} D_{ij} + e_i$$

Variable	Coefficient and [Absolute t-Statistic] Restricted	Unrestricted
Constant	1.281	1.106
	[10.32]	[6.92]
ln *MV*	−.110	−.091
	[7.16]	[5.59]
ln *PIH*	.158	.106
	[5.31]	[3.14]
ln σ_{FE}		.041
		[2.25]
ln *EC*		.006
		[.46]
D_1 (SIC 0100–1999)		−.112
		[.97]
D_2 (SIC 2000–3999)		.126
		[1.44]
D_3 (SIC 4000–4899)		.032
		[.29]
D_4 (SIC 4900–4999)		−.085
		[.86]
D_5 (SIC 5000–5999)		.113
		[1.10]
D_6 (SIC 6000–6999)		.052
		[.50]
(Adj.) R^2	.073	.099
F	26.87	8.26
$p(F)$	.0001	.0001

See table 2 for definitions of variables.

[6] Lipe [1990] reports similar correlations between market value, earnings predictability, and earnings coefficients using annual data for 143 NYSE firms.

TABLE 4

Correlations and Partial Correlations with Percentage Institutional Holdings, PIH (n = 658 NYSE firms)

Y_i	Corr(ln Y_i, ln PIH_i)	Corr(ln Y_i, ln PIH_i | ln MV_i, ln σ_{FEi}, ln EC_i, $\sum_{j=1}^{7} D_{ij}$)
ln $NANAL_i$	.6447*	.4109*
ln $BETA_i$	.3429*	.1303*
ln σ_{RETi}	−.0671	.0002
ln PTR_i	.2786*	.2073*
ln $DBLK_i$	.1155	.2651*
ln $DVOL_i$	.4752*	.0225
ln $DTNUM_i$	−.3151*	−.2138*
ln $DTSIZE_i$	.6031*	.3491*

*Significant at 5%, two-tailed.

$NANAL_i$ = the annual average number of analysts following the firm on *IBES* from 1979–85 (n = 642).

$BETA_i$ = the firm's average *OLS* return beta, estimated using two-day returns and the equally weighted index, averaged over the 28 quarters 1979–85.

σ_{RETi} = the firm's standard deviation of the residual return, averaged over the 28 quarters 1979–85.

PTR_i = the average percentage of a firm's outstanding shares traded during a fiscal quarter 1979–85.

$DBLK_i$ = one plus the average daily number of blocks traded from October 1984 to April 1985. A block is defined as a trade of at least .1% of the firm's outstanding shares (n = 653).

$DVOL_i$ = the average daily volume of shares traded from October 1984 to April 1985 (n = 653).

$DTNUM_i$ = the average daily number of trades from October 1984 to April 1985 (n = 653).

$DTSIZE_i$ = the average daily trade size from October 1984 to April 1985 (n = 653).

D_{ij} = Industry representation.

See table 2 for definitions of other variables.