Conference Calls and Information Asymmetry*

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We hypothesize that conference calls are voluntary disclosures that lead to long-term reductions in information asymmetry among equity investors. Cross-sectional and time-series tests show that the level of information asymmetry is negatively associated with conference call activity. We find that firms initiating a policy of holding periodic conference calls experience a sustained reduction in information asymmetry (although one-time callers experience no significant decline in asymmetry). Since prior work has shown that the cost of equity capital is increasing with information asymmetry, our results suggest that firms that hold conference calls more frequently have lower costs of capital.

Key Words: Information Asymmetry; Voluntary Disclosures; Conference Calls; Microstructure; Probability of Informed Trade

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1. Introduction

We examine whether voluntary disclosures, as measured by conference calls, are negatively associated with the level of information asymmetry among equity investors. Information asymmetry is a key concept in accounting because it drives the demand for financial disclosures. Economic theory suggests that greater disclosure reduces information asymmetry because it (1) directly lowers the amount of private information relative to publicly available information and (2) indirectly reduces private information search incentives. Therefore, we anticipate that more frequent conference calls will lead to a decrease in asymmetry. One reason why information asymmetry is particularly important to firms is because it is negatively related to the cost of equity capital. This negative relation arises because uninformed investors demand a premium to compensate for the risk of trading with privately-informed investors.[1] If holding conference calls reduces the level of information asymmetry, then the firm's cost of capital should also decrease.

We focus on conference calls for two primary reasons. First, the prior literature (Bushee et al., 2003; Frankel et al., 1999) has documented that on average, conference calls convey material information to the market as evidenced by significant increases in return volatility during the actual call periods. The disclosure of information to the market is a necessary condition for conference calls to reduce the level of information asymmetry. Second, Brown et al. (2003) document there is substantial variation in conference call activity, both across firms and across time. This high degree of cross-sectional and time-series variation allows for relatively powerful tests of the association between disclosures and information asymmetry.

We measure the level of information asymmetry using the Probability of Informed Trade (PIN), which is based on the EKO market microstructure model recently developed by Easley,

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[1] This risk is not diversifiable since uninformed investors will always be at a disadvantage relative to informed investors. Also, see O'Hara (2003).

Kiefer, and O'Hara (1997). The PIN is a firm-specific estimate of the probability that a particular trade order originates from a privately-informed investor, and hence, directly captures the extent of information asymmetry among investors in the secondary market. While new to accounting, this methodology has been successfully used in the finance literature.[2]

We find strong cross-sectional and time-series evidence supporting our hypothesis that a firm's conference call activity is negatively related to its level of information asymmetry. Our cross-sectional tests indicate that there is a negative and highly significant association between the number of conference calls held in one quarter and the level of information asymmetry during the subsequent quarter. The relation is significant in the pooled regression and in each of the 11 quarterly regressions. The magnitude of the pooled coefficient suggests that on average, each conference call is associated with a roughly three percent decrease in the level of information asymmetry. Combined with the results in Easley et al. (2002), this finding suggests that holding one conference call each quarter is associated with a 15 basis point reduction in the annual cost of equity capital.

Using a time-series analysis, we examine changes in information asymmetry in the periods surrounding a firm's initial conference call. We find a significant reduction in information asymmetry after the initial call for firms initiating a policy of holding periodic conference calls (although one-time callers experience no significant decline in asymmetry). The magnitude of the coefficient suggests that after adopting a policy of regularly holding conference calls, on average firms experience a roughly five percent decrease in the level of information asymmetry. These results suggest that only firms that have demonstrated a commitment to a higher level of disclosure experience significant decrease in the level of information asymmetry.

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[2] For example, the PIN has been used to investigate how informed trading varies across different stock exchanges (Easley et al., 1996) and types of securities (Easley et al., 1998), and the inter-temporal pattern of informed trading (Brockman and Chung, 2002).

We contribute to the voluntary disclosure literature in a number of ways. First, our finding

that calls are negatively related to the long-run level of information asymmetry suggests that any

increase in information asymmetry during the call period (Bushee et al. (2003), Frankel et al.

(1999)) is temporary. Second, we complement prior studies (Botosan, 1997) and (Botosan and

Plumlee, 2002) that examine the relation between disclosure activity and the cost of capital.

Economic theory suggests that disclosure can be related to the cost of capital either through

disclosure's effect on information asymmetry, or its effect on estimation risk, or both.[3] Our

findings suggest that at least part of the association between disclosure and the cost of capital is

due to the effect of voluntary disclosure on information asymmetry. In addition, we add to prior

studies (Welker, 1995, Healy et al., 1999) that examine the relation between disclosure quality

and spread-based proxies of information asymmetry by using a larger and more recent sample, a

more objective measure of disclosure activity, and a direct measure of asymmetry.

The next section develops the expected relation between conference calls and information

asymmetry, while Section 3 describes the EKO market microstructure model and the PIN

estimation procedure. In Section 4, we discuss our cross-section analyses, and our time-series

tests are presented in Section 5. Section 6 concludes the paper.

2. Background and Hypothesis Development

Information asymmetry exists when investors are differentially informed about a firm's value

and investors with superior information can trade profitably at the expense of other investors. To

compensate for these expected losses, uninformed investors will demand a return premium that is

increasing in the risk of trading with privately-informed investors (O'Hara, 2003). (Easley et al.,

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[3] Since an asset's risk and return distribution parameters are unknown, investors must bear the risk involved with estimating them. Investors must be compensated for bearing estimation risk if it is not diversifiable ((Coles et al., 1995)).

2002) provide empirical evidence that the level of information asymmetry is positively associated with firms' cost of capital.

Economic theory suggests that the risk of trading against a privately-informed investor depends on two factors: (1) how frequently such investors obtain private information and (2) how intensely they trade on their private information relative to the level of uninformed trading. Therefore (as explained more fully below), an increase in disclosure frequency will reduce the level of information asymmetry either by leading to a reduction in the frequency with which investors obtain private information ("private information events") or decreasing the relative amount of informed trading or both.

More frequent conference calls will lead to a reduction in how frequently investors become aware of private information in two ways. First, disclosure will directly preempt some future private information events by releasing the information publicly before it can be discovered privately. Conference calls allow firms to summarize and disseminate a large quantity of information that otherwise would likely have been privately discovered and traded on at some later date(s). Second, more frequent disclosures will lead investors to rationally anticipate that the firm is following an *ex ante* policy of frequently disseminating information and hence, is more likely to promptly release material information in the future. Such a disclosure policy will reduce the expected benefits of private information search activities. This indirect effect corresponds to that discussed in King et al. (1990), who posit that managers reduce the incentives for private information acquisition when they issue an earnings forecast.

More frequent conference calls will also lead to a reduction in information asymmetry if they reduce the relative amount of informed trading in the equity markets. Merton (1987) and Fishman and Hagerty (1989) describe models in which more informative disclosures reduce the

costs associated with processing and assimilating public information. As a result, increased disclosure will induce investing by uninformed liquidity traders. Diamond and Verrecchia (1991) find that under certain conditions, the amount of uninformed trading by large investors increases as the firm discloses more information.[4] These results suggest that uninformed investors are more likely to trade in firms with higher levels of disclosure. Therefore, we expect that as a firm holds conference calls more frequently, there will be an increase in the amount of uninformed trading. *Ceteris paribus,* increased uninformed trading decreases the risk of trading against a privately informed investor.[5]

This *ceteris paribus* condition is unlikely to hold since previous research indicates that increases in uninformed trading will be associated with more informed trading. Kyle (1985) finds that if investors are risk neutral and are not capital constrained, then the amount of informed trading will vary proportionately with the expected amount of uninformed trading. Thus, the relative amount of informed trading will be unchanged when the expected amount of uninformed trading changes. In practice, however, informed traders are likely to be risk averse and/or capital constrained, resulting in changes in the intensity of informed trading that are less than fully proportional to the changes in uninformed trading. Consequently, the net effect of more frequent conference calls will be relatively less informed trading.

Based on the above discussion, we expect that by holding conference calls more frequently, a firm will reduce the information search incentives of (potentially) privately-informed traders and alter the trading behavior of both uninformed and informed investors. Changing these incentives

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[4] Consistent with these models, (Leuz and Verrecchia, 2000) find a significant increase in trading volume for German firms committing to higher disclosure levels. Since bid-ask spreads also decrease, their evidence suggests that uninformed investors generate much of the increased trading.

[5] Consistent with this argument, accounting regulators and practitioners appear to believe that more and better disclosure by firms will lead to less information asymmetry among investors and "level" playing field so that the capital markets will be more appealing to uninformed investors (AICPA, 1994, FASB, 2001, Levitt, 1998).

will lead to a lasting impact on the level of information asymmetry that extends well beyond any temporary effects that occur during the call period (Bushee et al. (2003) and Frankel et al. (1999)). Thus, we test the following hypothesis, stated in alternative form:

> H1: Conference call activity is negatively associated with the level of information asymmetry.

Our ability to reject the null hypothesis of no association is made more difficult by the potentially endogenous relationship between disclosure and information asymmetry. In addition to disclosure affecting information asymmetry, managers' decisions to hold conference calls are likely to be influenced by the concurrent level of information asymmetry. For example, a manager could decide to hold a conference call because the current level of information asymmetry is high, in the belief that doing so would reduce the level of asymmetry. This potential endogeneity will tend to understate the magnitude of the association between disclosure and information asymmetry, making it more difficult for our tests to reject the null. For example, the cross-sectional association between call frequency and asymmetry will be less negative as firms with higher levels of (pre-call) asymmetry are likely to hold more calls. However, endogeneity should not induce significant results when in fact there are none. In addition, the empirical tests described below are designed to mitigate the effects of endogeneity on our results. Before proceeding with these tests, we first describe our measure of information asymmetry.

3. The PIN Measure of Information Asymmetry

Information asymmetry manifests itself when investors trade on the basis of their private information. While it is not possible to identify which trades are based on private information, the presence of privately informed traders in the market can be (imperfectly) inferred from large imbalances between the number of buy and sell orders. This observability provides the intuition

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behind the EKO model of information asymmetry (Easley, Kiefer, and O'Hara, 1997). The EKO model is a learning model in which the market maker draws inferences about the presence of private information based on the observed order flow. Over a trading day, prices converge to their full information levels as the private information is fully revealed through the trading activity of informed investors. Thus, one can estimate the probability of information-based trading (PIN) for a given stock in a particular period based on the daily order flow over that period.

The basic structure of the EKO model can be seen in the game tree in Figure 1. At the beginning of each day, nature determines whether one or more "informed" investors acquire private information. Private information events occur with probability α; no news days, $(1 - \alpha)$. When it occurs, private information contains either "good" news with probability $(1 - \delta)$ or "bad" news with probability δ, where good (bad) news indicates the asset is currently undervalued (overvalued). The asset is correctly valued on no-news days.

Trade orders are assumed to arrive sequentially to the market according to Poisson processes. Orders from uninformed buyers (sellers) arrive randomly at the daily rate ε_b (ε_s) every trading day. Orders from risk neutral and competitive informed traders arrive randomly at the daily arrival rate μ only on good- and bad-news days.[6] All of these arrival processes are assumed to be independent and their parameters are common knowledge across all traders and the market maker. The market maker sets prices to buy or sell shares at each point in time based on her current information set, and executes orders as they randomly arrive.

The trading process described above will lead to one of three general patterns of trade orders. On a no-news day, the model predicts a roughly equal number of buyer- and seller-initiated trade

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[6] This assumption implies that short sales constraints are not binding.

orders.[7] On a good- (bad-) news day, there will be a large imbalance in the order flow, with buyer-initiated (seller-initiated) trades predominating. Each of these patterns corresponds to a branch of the game tree shown in Figure 1.

Although unaware of which branch was chosen by nature on any given day, the market maker knows the probability of each branch and the expected order process associated with them. She uses the observed number of buys and sells to update her beliefs throughout the trading day via Bayes Rule. Although her beliefs during the day depend on the actual sequence of trade orders on that day, the probability of informed trade at the beginning of the day has the following simple form:

$$PIN = \frac{\alpha\mu}{\alpha\mu + \varepsilon_b + \varepsilon_s}$$ (1)

The PIN measure represents the expected fraction of trades that are information-based since the numerator is the expected number of orders from privately-informed investors and the denominator is the expected total number of orders each day. Thus, the ratio of the two is the *ex ante* probability that the first trade of the day is based on private information. Consistent with economic intuition, equation 1 shows that the level of information asymmetry is increasing when there are more frequent private information events (α), more informed trading (μ), and is decreasing in the willingness of uninformed investors to trade in the stock (ε_b and ε_s).

The likelihood function induced by the EKO model for a trading day, conditional on the parameter vector $\theta = (\alpha, \delta, \varepsilon_b, \varepsilon_s, \mu)$, is determined by a mixture of the three possible components (no news, good news, and bad news) with weights reflecting the probabilities of their occurrence in the data. Letting B and S equal the daily number of buyer- and seller-initiated trades,

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[7] Although we do not restrict $\varepsilon_b = \varepsilon_s$, our results indicate that these parameters are generally quite close in magnitude.

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respectively, the likelihood function for a particular trading day is:

$$L(B,S\mid\theta)=(1-\alpha)e^{-\varepsilon_b}\frac{\varepsilon_b^{B}}{B!}e^{-\varepsilon_s}\frac{\varepsilon_s^{S}}{S!}+\alpha\delta e^{-\varepsilon_b}\frac{\varepsilon_b^{B}}{B!}e^{-(\mu+\varepsilon_s)}\frac{(\mu+\varepsilon_s)^{S}}{S!}$$
$$+\alpha(1-\delta)e^{-(\mu+\varepsilon_b)}\frac{(\mu+\varepsilon_b)^{B}}{B!}e^{-\varepsilon_s}\frac{\varepsilon_s^{S}}{S!}$$

(2)

As can be seen from equation 2, the daily numbers of buy and sell orders are sufficient

statistics for the data. As one observes the order flow over an increasing number of days, one

can estimate the parameter vector θ with increasing precision, assuming that the parameter vector

θ is stationary. Essentially, the model uses the normal level of buying and selling to identify ε_b

and ε_s. Abnormal buy or sell order volume is interpreted as information-based trading and

identifies μ. The number of days on which there is abnormal buy or sell volume identifies α and

δ. The maximum likelihood estimates of each firm's parameter vector θ over a particular period

then allows us to calculate firm- and period-specific PINs via equation 1.[8]

Empirical Implementation

In order to estimate the PIN parameter vector θ, we require the daily numbers of buy and sell

orders over each estimation period for each firm. The number of observations in each estimation

period depends on the specific analysis, with the minimum being about 30 trading days and the

maximum is 62 trading days. Trade order data for NYSE, AMEX and Nasdaq traded stocks are

obtained from the Trades and Quotes (TAQ) database.[9] We classify each trade as buyer- or

seller-initiated using the standard Lee-Ready algorithm (Lee and Ready, 1991). The algorithm

classifies any trade that takes place above (below) the midpoint of the current quoted spread as a

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[8] For example, consider a stock that on 60% of the days, there are 50 buys and 50 sells, on 20% of the days there are 80 buys and 50 sells; and on 20% of the days there are 50 buys and 80 sells. The EKO model parameters would be identified as $\varepsilon_b = \varepsilon_s = 50$, $\mu = 30$, $\alpha = .40$, and $\delta = .50$. The corresponding PIN equals 10.7%.
[9] In addition to including indicator variables in our analysis to control for exchange related differences, we also conduct sensitivity analyses by either excluding NASDAQ firms or only including NASDAQ firms (because the exchange does not use market makers). None of our inferences are changed for these analyses.

buy (sell) because trades originating from buyers (sellers) are most likely to be executed at or near the ask (bid). For trades taking place at the midpoint, a "tick test" based on the most recent transaction price is used to classify the trade. Following standard practice, we use a five second lag on reported quote times to adjust for differences in reporting times between quotes and trades on the NYSE. Following the recommendation in Ellis et al. (2000), we do not adjust quote times for NASDAQ and AMEX trades. Additionally, large trades are often broken down and matched against multiple investors. TAQ reporting conventions will often classify such a transaction as multiple trades. Following Hasbrouck (1988), we classify all trades occurring within five seconds of each other as a single trade.

We eliminate observations with extreme EKO parameter estimates using the following filters: (1) if $50\mu > \varepsilon$ or $50\varepsilon > \mu$, where $\varepsilon = \varepsilon_b + \varepsilon_s$; (2) if $\alpha < 0.02$ or $\alpha > 0.98$; (3) if $\delta < 0.02$ or $\delta > 0.98$; and (4) if $\min(\varepsilon, \mu) < 1$. The specific numbers of observations eliminated with each filter vary with each analysis and are discussed in Sections 4 and 5 below. As a robustness check, we replicated each analysis reported in the tables below without applying any of the filters. In none of the analyses did the results change qualitatively. Specifically, all of the conference call variables retain the same sign and remain significant at the 5% level or better when the coefficients reported in the tables are significant.

4. Cross-sectional Analyses

In this section, we examine the cross-sectional association between the frequency of conference calls and information asymmetry. The advantage of a cross-sectional analysis over a time-series approach is that the variation in the conference call activity is potentially higher, thereby permitting more powerful tests. By the same token, other factors correlated with information asymmetry will also vary more across firms, so it is important to ensure that adequate control

variables are employed.

4.1. Regression Specification

The regression equation is shown in equation 3, with *i* and *t* denoting the firm and calendar quarter, respectively. We choose to use calendar quarters because our data show a distinct seasonal pattern in conference call frequency within each quarter. Our sample begins in January 1999 and extends through December 2001 and includes all NYSE, AMEX and Nasdaq firms that had at least one conference call during the period.

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\begin{aligned}
PIN_{i,t} = \boldsymbol{\beta_0} &+ \beta_1 Calls_{i,t-1} + \beta_2 Size_{i,t} + \beta_3 Inside_{i,t} + \beta_4 InstOwn_{i,t} \\
&+ \beta_5 Analysts_{i,t} + \beta_6 Consensus_{i,t} + \varepsilon_{i,t}
\end{aligned}
\tag{3}
$$

In equation 3, $\boldsymbol{\beta_0}$ is a vector of indicator variables for the stock exchange, calendar quarter, and 48 industries based on the Fama and French (1997) classification, *Calls* is the number of conference calls held during the prior quarter, *Size* is firm size, *Inside* is stock ownership by insiders, *InstOwn* is stock ownership by institutions, *Analysts* is the number of stock analysts covering the firm, and *Consensus* is the degree of consensus among analysts. Detailed variable descriptions are provided in Sections 4.2 and 4.3 below.

Measuring *PIN* in the calendar quarter after the quarter in which the conference calls are held (if any) ensures that the market had access to the information conveyed during the calls before the PIN estimation period begins. This procedure also allows us to avoid a potential confounding effect caused by an increase in information asymmetry around the time of the conference call. For example, if investors have varying abilities to process information (Kendel and Pearson, 1995), (Kim and Verrecchia, 1994), then skilled investors will be able to transform public information into private information when the disclosed information is a noisy signal of firm value. Frankel et al. (1999) and Bushee et al. (2003) find evidence consistent with

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conference calls leading to a temporary increase in information-based trading. However, any

such informational advantages will be short-lived when there are many market participants with

access to the conference call (Foster and Viswanathan, 1993).

4.2. Conference Calls

For each calendar quarter, we record the number of conference calls made by each firm. We

include calls that were listed on any of the following sources that track conference calls:

BestCalls.com, CCBN.com, and First Call. Bestcalls.com aggregates information from a variety

of sources about conference calls that are open to the public and then makes this information

freely available on its web site. CCBN.com is the leading provider of earnings-related webcasts

of conference calls and currently services more than 3,000 calls in a typical quarter. First Call is

a leading provider of financial information and has long tracked conference call activity.

Firms can use alternative types of voluntary disclosures besides conference calls, such as

management forecasts and press releases, to disseminate information to the market. To the

extent that conference calls and other types of voluntary disclosures are substitutes, this will

reduce our ability to detect the effect of conference calls on the level of information asymmetry.

Alternatively, if conference calls are positively correlated with other voluntary disclosure

activities, then conference calls should be interpreted as being indicative of firms' overall

propensity to disclose information voluntarily. For example, (Miller, 2002) finds that for a

sample of 80 firms, disclosure frequency is positively correlated across different types of

disclosures.

4.3. Control Variables

To isolate the effect of conference calls on information asymmetry, we include variables to

control for other aspects of the firm's information environment that are likely to be associated

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with both *PIN* and the number of conference calls. The first variable we include is *Size*, which is defined as the natural log of the firm's equity market value measured at the beginning of quarter *t* using data from CRSP. Based on the results in Atiase (1985), Bamber (1987), and Diamond and Verrecchia (1991), we expect a negative association between *Size* and *PIN*.

We include three variables to control for the presence of sophisticated and potentially informed market participants. *Inside* (*InstOwn*) is the proportion of the firm's shares held by insiders (institutions) at the beginning of the quarter *t*.[10] Ayers and Freeman (2000) and Jiambalvo et al. (2002) find that current returns reflect future earnings to a greater extent when the percentage of institutional and inside ownership is higher. This suggests that there is more current informed trading based on future earnings information for these firms, and hence, more information asymmetry. Accordingly, we expect the coefficients on *Inside* and *InstOwn* will be positive. *Analysts* is the number of analysts making forecasts during the quarter *t* about the following quarter's earnings and is obtained from First Call. Since Easley et al. (1998) find that PINs are negatively associated with the level of analyst following, we expect the coefficient on *Analysts* will be negative.

Consensus is used as a proxy for the degree of certainty about the expected level of earnings. Zhang (2001) finds that the amount of earnings uncertainty is positively associated with both the level of information asymmetry and disclosure quality. Thus, we expect *Consensus* to be negatively associated with *PIN*. We define *Consensus* as $ln(1 + 1/STD)$, where *STD* is the standard deviation of EPS forecasts, averaged over the quarter. We use the quarterly average since the standard deviation changes each time a forecast is added, dropped, or revised. When there are fewer than two forecasts, *Consensus* is set to the arbitrarily low value of zero.

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[10] Insider ownership data come from Lancer Analytics and includes direct and indirect holdings, along with derivative holdings such as options, held by all officers, directors, and other top executives. Institutional ownership data come from the CDA/Spectrum 13F institutional holdings database.

4.4. Sample description

Our sample is made up of all firms that have at least one conference call between January 1, 1999 and December 31, 2001 recorded in any of the sources described above, together with required data from TAQ, CRSP, Spectrum and Lancer Analytics. While excluding firms that had no calls throughout our sample period will reduce the power of our tests, this restriction ensures that the types of firms analyzed are not substantially different from each along unanticipated dimensions that we cannot control for in the regression.

Our final sample consists of 34,035 firm-quarters representing 5,754 individual firms and we report descriptive statistics in Table 1 Panel A. Over the sample period, the total number of calls is 31,652 giving a mean (median) number of calls per firm per quarter of 0.93 (1). The mean (median) *PIN* is 18.24 (17.16), which indicates that there is a roughly 18% probability that the opening trade on any given day is based on private information. The mean and median α show that private information events occur on almost 40% of trading days. The average value of $ln(\mu/\varepsilon)$ implies that $\mu/\varepsilon = 0.55$) and indicates that informed trades are about half the volume of uninformed trades and represent about 1/3 of total trades on information event days. For the average firm, 30% of its outstanding shares are owned by insiders and 43% are owned by institutions. Consistent with previous studies, the extent of analyst following is quite skewed with the mean being over 2 while the median firm-quarter has no analyst coverage.

Summary statistics on the number of conference calls for each quarter are provided in Table 1, Panel B, which shows that both the absolute number of calls and the average number of calls per firm have both increased dramatically over our sample period. The number of calls each quarter increased from less than 1,500 at the beginning of 1999 to over 3,300 in 2001. At the same time, the mean number of calls per firm increased from 0.56 at the beginning of our sample

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period to over 1.0 in each quarter in 2001.

As shown in Table 2, there is a significant negative correlation between the number of conference calls in period *t-1* and *PIN* in period *t* (-0.25), providing preliminary evidence supporting our hypothesis. The strongest correlations between *PIN* and the control variables are with *Size* (-0.76), *InstOwn* (-0.44), and *Inside* (0.35). All of the correlations with *PIN* are of the expected sign with the exception of *InstOwn*. This unexpected result may be caused by the combination of the large positive correlation between *Size* and *InstOwn* (0.58) and the large negative correlation between *Size* and *PIN*.

4.5. *Conference Calls and Information Asymmetry*

To investigate the cross-sectional association between the frequency of conference calls in one quarter and the level of information asymmetry in the subsequent quarter, Table 3 presents the results of estimating equation 3 for the entire pooled sample as well as for each of the eleven quarterly time periods.[11] Overall, the explanatory power of the regressions is quite high, where the adjusted-R^2 is 59% in the pooled regression and ranges from 53% to 65% in the quarterly regressions. The results for the pooled regression show that the number of conference calls in quarter *t-1* is negatively and significantly associated with the level of information asymmetry in quarter *t* ($t = -14.9$).[12] The quarterly regressions are generally consistent with the pooled regression, although the significance levels are predictably lower given the smaller sample sizes. All eleven of the quarterly conference call coefficients are significant at the 0.001 level or better, with the exception of the second quarter of 1999, where the coefficient is only significant of the 5% level. The magnitude of the *Calls* coefficient is –0.59 in the pooled regression and ranges

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[11] Employing the four filters for extreme values of the PIN parameters described in Section 3 eliminates 156, 981, 3,411, and 845 firm-quarter observations, respectively, from the pooled regression.

[12] All reported *t*-statistics are based on Huber-White standard errors. The results presented below are not sensitive to the inclusion of outliers identified as observations having studentized residuals with absolute values greater than 3.

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from –0.30 to –0.91 in the quarterly regressions. No temporal trends are evident in the quarterly coefficient magnitudes.

The *Calls* coefficient in the pooled regression indicates that PINs in one quarter are 0.59 percentage points lower for each conference call held during the prior quarter. This represents a 3.2% decrease relative to the mean *PIN* of 18.24, which in our view is a moderate and economically plausible effect on the level of information asymmetry. Combined with the results in Easley et al. (2002) on the association between PINs and the cost of equity capital, our results suggest that holding a conference call each quarter is associated with a 15 basis point reduction in the annual cost of equity capital.

Brown et al. (2003) find that over a similar sample period, more than 80% of firms that hold a conference call in one quarter hold at least one call during the subsequent quarter. This observation suggests that the negative association between the number of calls in period *t-1* and the level of information asymmetry in period *t* could be driven in part by the number of calls during period *t*, and thus, the results in Table 3 are potentially overstated. In order to investigate this possibility, we augment equation 3 with the number of conference calls held in period *t* and repeat the analyses. Untabulated results show that all of the coefficients on *Calls$_{t-1}$* are negative, though slightly smaller in magnitude than their counterparts in Table 3, and all but one (second quarter of 1999) is significant at the 1% level. Additionally, all of the coefficients on *Calls$_t$* are negative and seven are significant at the 5% level. Thus, even after controlling for the number of contemporaneous calls, PINs are negatively associated with the number of conference calls during the prior quarter.

The coefficients for the control variables *Size*, *Inside*, and *Analysts* all have the expected signs and are significant at the 5% level or better in the pooled regression and in each of the

quarterly regressions. The results show that firm size is negatively associated with *PIN*.[13] This result is consistent with our intuition that information asymmetry is less prevalent in large firms. Consistent with Ayers and Freeman (2000) and Jiambalvo et al. (2002), we find that firms with more ownership by insiders also have higher levels of information asymmetry. Additionally, all of the *Analysts* coefficients are negative and significant, indicating that greater analyst coverage is negatively related to the level of information asymmetry. These results are consistent with Easley et al. (1998) and Jiambalvo et al. (2002).

The results for the other two control variables, *InstOwn* and *Consensus*, are less consistent with our expectations. In the pooled regression, *InstOwn* is significantly positive (t = 2.05) as hypothesized. However, the quarterly regressions show that this result masks the fact that *InstOwn*'s association with *PIN* has been inconsistent over time. The results show while the *InstOwn* coefficient is positive in 8 of the 11 quarterly regressions (and significant in 4 of them), it is (significantly) negative in 3 (2) of the quarterly regressions. All of the negative coefficients occur in 2001.

While the association between *InstOwn* and *PIN* varies over the sample period, the association between *Consensus* and *PIN* is consistently positive, which is contrary to our expectations. The association is highly significant in the pooled regression and in 7 of the 11 quarterly regressions. One possible explanation for this finding is that it is driven by the high positive correlation between *Analysts* and *Consensus* (0.89). Unreported results show that this is only a partial explanation as the pooled *Consensus* coefficient remains significantly positive

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[13] Given the importance of *Size* in the regressions, we test whether the associations between *PIN* and conference call frequency are being driven by non-linearities in the relation between *PIN* and *Size* by including higher order terms of *Size* in the regression. Augmenting the regression in this way does not alter any of our inferences.

(though at a reduced level) when we exclude *Analysts* from the regression equation.[14] We also

examine whether our decision to assign the minimum *Consensus* score of zero to firms with less

than two analyst forecasts is causing this result, but restricting the sample to firms with two or

more analysts does not alter our inferences.

Having found that the number of conference calls is negatively associated with the level of

information asymmetry in the cross-section, we now investigate the sources of this association.

Recall from Section 2 that voluntary disclosures will be related to asymmetry through two

channels: a reduction in how frequently investors become aware of private information and a

reduction in the relative trading intensity of informed investors. Thus, we examine how

conference call frequency is related to the frequency of private information events, α, and the

relative amount of uninformed trading, $ln(\mu/\varepsilon)$.

The regression specification is similar to equation 3, except that the dependent variable is

based on the underlying PIN parameters rather than the PIN itself. Panel B of Table 3 presents

these results. The α regression results in row 1 show that the number of conference calls in

period *t-1* is positively and significantly related to probability of an information event in period *t*,

which is unexpected, since PIN is an increasing function of α. Thus, the negative associations

between conference calls and information asymmetry documented in Panel A are not being

driven by a subsequent reduction in the frequency of information events.

The second regression reported in Panel B examines the net effect of disclosure frequency on

the relative arrival rates of informed to uninformed traders, $ln(\mu/\varepsilon)$. Row 2 shows that the *Calls*

coefficient is significantly negative, indicating that more conference calls in one period are

associated with relatively less trading by privately-informed investors in the next period. This

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[14] Unreported results show that the inferences from Table 3 are unchanged when *Consensus* is left out the
regressions. The significance levels for the *Analyst* coefficients, while reduced, remain quite high.

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finding is consistent with our arguments in Section 2 that more frequent conference calls will attract more uninformed investors to the firm and that any increases in informed trading will not be fully offsetting. The coefficient estimates from these two regressions combined with the mean values of α and $\ln(\mu/\varepsilon)$ from Table 1 indicate that the reduction in μ/ε is about four times as large as the increase in α. Whereas each call is associated with a $1/80^{th}$ increase in α (0.49%/39.51%), it is associated with a $1/20^{th}$ decrease in μ/ε (-0.05/-0.61). Thus, the results in Panel B indicate that more conference calls are associated with less information asymmetry via reductions in the relative amount of informed trading, and this effect overcomes the increase in the frequency of information events.

4.6. *Endogeneity between conference calls and information asymmetry*

The results reported above could be biased if the relationship between conference calls and information asymmetry is endogenous. That is, if firms hold more (fewer) conference calls in response to high (low) levels of asymmetry, then the association between calls and PINs documented above will be understated. To determine whether endogeneity is a significant factor, we examine a set of firms for which the decision to hold a conference call is less likely to be a function of the level of information asymmetry in the pre-call period.

We examine a set of firms who are "Regular" callers that routinely host conference calls in conjunction with their earnings announcements. Specifically, a firm is classified as a "Regular" caller in a particular calendar quarter if it had least two calls in conjunction with its quarterly earnings announcements (+/– 1 day) over the previous three calendar quarters.[15] Firms that regularly hold conference calls in conjunction with their earnings announcements are likely following an *ex ante* disclosure policy. As such, the decision to host a call in the current period

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[15] We do not impose the restriction of three calls in three calendar quarters because the interval between quarterly earnings announcements is frequently different than three months.

is unlikely to be affected by the level of asymmetry in the preceding calendar quarter. Following

similar reasoning, we also examine all firms that did not hold a single conference call during the

previous three calendar quarters. These restrictions reduce our sample to 21,259 firm-quarters.

In order to assess the sensitivity of the results in Table 3, Panel A to the potentially

endogenous relation between conference call activity and information asymmetry, we re-estimate

the cross-sectional regression in equation 3 using our restricted sample. The untabulated results

from this analysis show that the *Calls $_{t-1}$* coefficient is significantly negative (t = –13.4). The

magnitude of the coefficient (–0.69) is only slightly larger in magnitude than the magnitude of

the coefficient (–0.59) based on the entire sample. In addition, untabulated tests show that the

magnitudes of the *Calls $_{t-1}$* coefficients in the α and $\ln(\mu/\varepsilon)$ regressions are slightly larger (and

equally significant) compared to their counterparts in Table 3, Panel B. These results suggest

that that any endogeneity between conference call activity and asymmetry only affects the results

in Table 3 to a small extent, and as we discussed in Section 2, makes it more difficult to reject

the null hypothesis.

5. Time-series of PINs Around Changes in Disclosure Policy

While we controlled for several important factors in the cross-sectional tests described in Section

4, it is possible that we have omitted one or more variables that are correlated cross-sectionally

with both *PIN* and *Calls*. It is possible that any such omission(s) could have produced spuriously

the negative associations between *PIN* and *Calls* that were documented in Table 3. In this

section, we present time-series tests that use each firm as its own control in order to mitigate any

omitted correlated variable problem. Similar to the approach in Coller and Yohn (1997), we

examine whether firms experience less information asymmetry after they hold an initial

conference call. We consider a conference call to be an Initiation call for firm *i* if the firm held

no other calls during the previous 13 months. We use a period of 13 months to avoid

misclassifying firms that regularly hold one call a year, perhaps in conjunction with their annual

earnings announcements. Focusing on conference call initiations allows for a relatively powerful

test if the impact of calls on asymmetry is a long-lasting one, as we expect.

Our call initiation sample extends from January 1999 through June 2002. Given our

classification criteria of no calls within the last 13 months, this implies that the earliest Initiation

calls occur in February 2000. Our sample consists of 2,092 Initiations. As our focus is on the

long-term effects of disclosures, we exclude the one-week period surrounding the Initiation call

(-3 to $+3$ calendar days). Week -1 to week -13 inclusive comprises the Pre-Initiation period -1,

weeks -14 to -26 (-27 to -39) comprise period -2 (-3), and likewise for the Post-Initiation

periods. The following timeline summarizes the timing of variable measurement for this

analysis.

		Pre-Initiation			Initiation	Post-Initiation		
Period #	-3	-2	-1	0	$+1$	$+2$	$+3$
Event Week	-39 ... -27	-26 … -14	-13 … -1	0	1 … 13	14 … 26	27 … 39

Thus, the data are aligned in event time according to the date of the Initiation. After applying the

extreme PIN parameter filters described in Section 3, we obtain 8,333 firm-periods.[16]

While this time-series research design minimizes the possibility of omitting cross-sectionally

correlated variables, persistent over-time changes in the average level of information asymmetry

in one direction or the other due to market-wide factors can confound the inferences. For

example, a systematic decline in PINs over time can lead to a significantly lower post-Initiation

PINs compared with pre-Initiation levels even though the decline is not due to the Initiation

event. To prevent this problem from occurring, we specifically control for systematic time

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[16] Employing the four filters for extreme values of the PIN parameters described in Section 3 eliminates 14, 103, 1,359, and 505 observations, respectively.

trends in our analyses. The regression equation is as follows, with i indicating the firm and τ the

time period:

$$PIN_{i,\tau} = \gamma_0 + \gamma_1 PostInitiation_{i,\tau} + \gamma_2 Time_{i,\tau} + e_{i,\tau} \qquad (4)$$

In this equation, *PostInitiation* = 1 if the period is after the Initiation week and 0 otherwise. In

the first specification reported in Table 4, *Time* is a continuous variable corresponding to the

calendar date of the Initiation event. In the second specification, *Time* is a vector of indicator

variables corresponding to the calendar quarter in which the Initiation event occurs.

The results of estimating equation 4 are presented in Table 4, Panel A. Models 1 and 2

include all call initiators with available data and PINs are estimated for the three Pre-Initiation

and three Post-Initiation periods. The results for Model 1 show that PINs are significantly lower

at the 0.1% level (t = -5.33) for firms after they hold an initial conference call. The

PostInitiation coefficient is –1.26, which indicates that PINs fall by over one percentage point on

average after the initial conference call. We find this magnitude to represent a moderate and

economically plausible effect on the level of information asymmetry. Although this coefficient

is about twice as large in magnitude as the cross-sectional coefficient of –0.59 on *Calls* reported

in Table 3, recall that *PostInitiation* is an indicator variable, whereas *Calls* is a count variable

that has 1st and 99th percentile values of 0 and 3, respectively (see Table 1). The results in

Model 2, which uses the quarterly indicator variables, are almost identical.

Lang (1998) observes that the choice to hold a conference call often constitutes a

commitment to a change in disclosure policy as firms that hold a conference call typically

continue to hold them on a regular basis. Economic theory suggests that Initiation events that

represent an *ex ante* commitment to a higher level of disclosure will have a larger impact on the

level of information asymmetry compared to one-time disclosures that do not represent a change

in disclosure policy. While we cannot determine firms' *ex ante* intentions directly from our data, we can use their call behavior after the initial conference call as indications of those intentions. Models 3 – 5 in Table 4 show the results when we analyze firms classified by their post-Initiation call behavior.

In Models 3 and 4, we eliminate all firms that do not have a single conference call in the 39 weeks following the initiation period. In Model 3, we restrict the initiation sample to those firms that had at least one call during any of the three post-initiation quarters. This restriction reduces the sample size to 6,378 firm-quarter observations. In Model 4, we impose a tighter restriction and only include firms that had at least one call in the first post-Initiation period. We impose this restriction in order to increase the likelihood that the sample contains firms that have committed to a policy of regularly holding calls. Assuming that market participants require the subsequent call to confirm the change in disclosure policy, we exclude observations from the first post-Initiation period so that the analysis is not contaminated by information not available to the market. This restriction reduces the sample size to 3,540 firm-quarters. In Model 5, we examine the remaining firms that did not have any conference calls in the 39 weeks subsequent to the initial call. This sample contains 1,955 firm-quarters, which is roughly 25% of the total Initiation sample. We do not expect that holding a single call will lead to a significant long-term decrease in asymmetry because without signifying increased disclosure in the future, it is unlikely to alter the behavior or either uninformed or (potentially) informed investors.

The results show that for both Models 3 and 4, PINs are significantly lower in the post-initiation periods (t = –2.97 and –2.56, respectively). The magnitudes of the two *PostInitiation* coefficients are similar to each other (-0.83 and –0.99, respectively) and are about the same magnitude as in Models 1 and 2. The magnitudes of the coefficients suggest that after adopting a

policy of regularly holding conference calls, on average firms experience a roughly five percent

decrease in the level of information asymmetry. As expected, the *PostInitiation* coefficient (-

0.32) in Model 5 is not significantly different from zero (t = -0.67). Together, these results

suggest that only firms that have demonstrated a commitment to a higher level of disclosure

experience significant decreases in the level of information asymmetry after the initial call.

When the initial call appears to represent a one-time *ex post* disclosure decision, perhaps in

response to an unusual event such as an acquisition or change in CEO, then we find no evidence

that the single call leads to a significant, long-term effect on the level of information asymmetry.

Similar to the analysis presented in Table 3, Panel B, we examine how the PIN parameters

change in the periods surrounding an initial conference call. Specifically, we examine the

change in the frequency of private information events, α, and the relative amount of informed

trading, $ln(\mu/\varepsilon)$ around the Initiation period. The regression specification follows equation 4,

except that the dependent variables are the PIN parameters rather than the PIN itself. The results

are presented in Table 4, Panel B and are based on the full Initiation sample of 8,333 firm-

quarters.

The results from these analyses are consistent with those from the cross-sectional

regressions in Panel B of Table 3. In particular, the α regression results show that the probability

of an information event increases after an initial conference call as the *PostInitiation* coefficient

is significantly positive (t = 4.63), contrary to our expectations. The $ln(\mu/\varepsilon)$ regression results

show that the *PostInitiation* coefficient is significantly negative (t = –6.8), indicating that after

the initial conference call, relatively more uninformed investors trade in the firm. More

uninformed trading reduces the risk of trading with a privately informed investor. This negative

effect on PIN dominates the positive effect on PIN via the increase in α and explains the

negative association documented in Table 4, Panel A.

Some caution should be taken in interpreting the results in this section since the decision to hold an initial conference call might be endogenously related to the prior level of information asymmetry. For example, unusual events (mergers, top management changes, etc.) might cause both a higher level of asymmetry in the pre-Initiation period and lead the firm to hold the initial call. In such cases, the level of uncertainty would fall mechanically after the uncertainty about the event resolves itself in the post-Initiation periods, thereby inducing our results. However, one-time events that would lead to such a mechanical effect would likely result in firms holding a single conference call, rather than implementing a policy of increased disclosure that results in subsequent conference calls. Our findings that the post-Initiation decrease in asymmetry is only significant for firms that hold additional calls provides confidence that it is the firm's change in disclosure policy that is leading to the decrease in *PIN*, rather than a mechanical decline due to the resolution of event-related uncertainty.

6. Summary and Conclusions

In this paper, we investigate the long-run association between conference calls and the level of information asymmetry between investors. This research question is important because prior research demonstrates that the level of information asymmetry is positively associated with the cost of equity capital (Easley et al., 2002). We use the Probability of Informed Trade (PIN) as our measure of information asymmetry, which is based on the EKO market microstructure model (Easley, Kiefer, and O'Hara, 1997).

We find strong evidence supporting our hypothesis, which is in contrast to the suggestion in Leuz and Verrecchia (2000) that the disclosure environment in the U.S. is uniformly too rich to allow researchers to detect measurable economic benefits of higher disclosure levels. We find

that there is a highly significant and negative association between conference call frequency and the subsequent level of information asymmetry in the cross-section after controlling for potentially confounding factors. We also examine whether information asymmetry is lower for firms after they hold an initial conference call. We find that firms whose initial calls are followed by subsequent calls experience a significant reduction in asymmetry after the initial call. At the same time, firms that do not hold additional calls in subsequent quarters do not experience a decrease in asymmetry. These results suggest that only *ex ante* commitments to increased disclosure result in sustained decreases in asymmetry, consistent with economic theory.

We also examine the underlying causes of the negative relation between conference calls and information asymmetry. We find that more frequent conference calls are associated with less trading by privately informed investors relative to the amount of trading by uninformed investors. These findings are consistent with the theoretical results in Fishman and Hagerty (1989) and Merton (1987) that more informative disclosures by firms increase the amount of uninformed trading.

Finally, our results should be interpreted with some caution, as it is a partial analysis that does not take account of other avenues of voluntary disclosure. If conference calls are complements for other disclosures used by firms, the reduction in information asymmetry that we find may be driven by those other disclosures rather than the conference calls themselves. To clarify this matter requires the examination of the association between a more comprehensive measure of voluntary disclosure activity and information asymmetry, and whether such additional disclosure activities complement or substitute for conference calls.

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Figure 1 – Game Tree for EKO Model
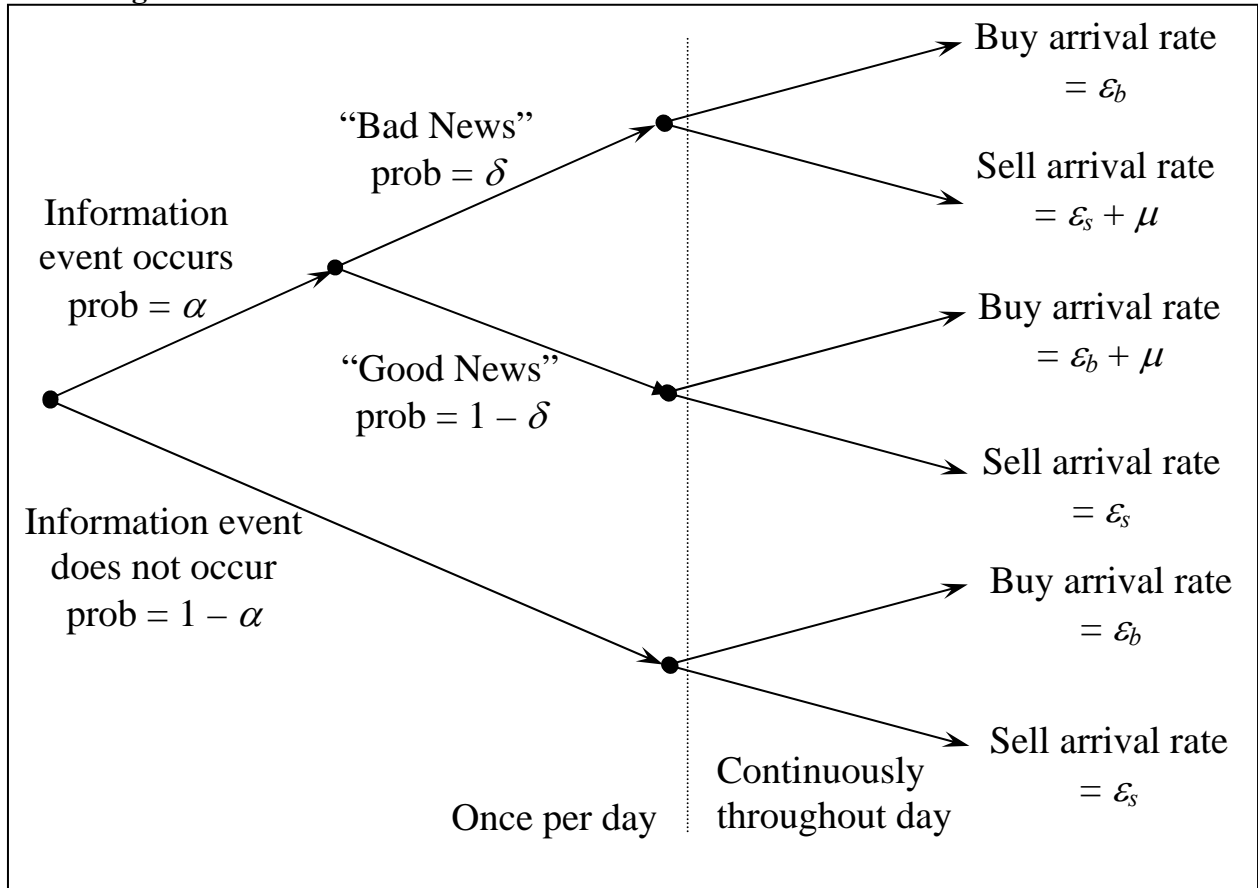
Notes:

α is the probability of an information event

δ is the probability that the information event contains bad news

μ is the daily rate of informed trade arrival,

ε_B (ε_S) is the daily rate of uninformed buy (sell) trade arrivals.

Nodes to left of the dotted line occur once per day while trade occurs continuously throughout the day to the right of the line.

Table 1 – Descriptive statistics for cross-sectional analysis

Panel A – Descriptive statistics for cross-sectional regression variables

PIN is the Probability of Informed Trade in calendar quarter *t* according to the EKO microstructure model. α is the probability of a private information event. $ln(\mu/\varepsilon)$ is the natural log of the ratio of the daily rate of informed trading on information event days to the daily rate of uninformed trades. *Calls* is the number of conference calls held in calendar quarter *t-1*. *Size* is the natural log of market value at the beginning of quarter *t*. *Inside* is the ratio of shares and derivatives owned by insiders to the number of shares outstanding. *InstOwn* is the proportion of outstanding shares owned by institutional shareholders. *Analysts* is the number of analysts making earnings forecasts during quarter *t*. *Consensus = ln(1+1/STD)* where *STD* is the standard deviation of EPS forecasts, averaged over the quarter. n = 34,035.

	Mean	Std	1%	Median	99%
PIN (%)	18.24	7.68	5.41	17.16	38.80
α	39.51	11.79	12.74	39.67	66.29
$ln(\mu/\varepsilon)$	–0.61	0.69	–2.14	–0.60	0.90
Calls	0.86	0.70	0	1	3
Size	12.79	1.81	9.14	12.71	17.29
Inside	0.30	0.28	0.00	0.20	1.00
InstOwn	0.43	0.26	0.01	0.43	0.93
Analyst	2.08	3.44	0	0	16
Consensus	2.64	3.53	0	0	12.05

Panel B – Conference calls and PINs by calendar quarter

Quarter	Firms	PIN (%)		Calls		
		Mean	Std	Total	Mean/Firm	Std
Q1 1999	2,682	N/A	N/A	1,180	0.44	0.59
Q2 1999	2,726	18.16	6.97	1,519	0.56	0.69
Q3 1999	2,875	18.32	7.14	2,132	0.74	0.69
Q4 1999	3,047	18.57	7.25	2,448	0.80	0.66
Q1 2000	3,011	16.63	6.85	2,677	0.89	0.65
Q2 2000	3,083	17.85	7.51	2,753	0.89	0.65
Q3 2000	3,109	18.23	7.53	2,849	0.92	0.62
Q4 2000	3,214	18.43	7.79	3,192	0.99	0.66
Q1 2001	3,347	18.61	8.37	3,594	1.07	0.69
Q2 2001	3,203	19.13	8.51	3,585	1.12	0.70
Q3 2001	3,237	18.61	8.10	3,363	1.04	0.61
Q4 2001	3,183	18.56	8.22	3,540	1.11	0.66

Table 2 – Spearman Rank Correlations

All correlations are significant at the 5% level or less. See Table 1 for variable definitions.

	PIN	α	$ln(\mu/\varepsilon)$	Calls	Size	Inside	InstOwn	Analyst	Consensus
PIN	1								
α	–0.20	1							
$ln(\mu/\varepsilon)$	0.86	0.63	1						
Calls	–0.25	0.22	–0.31	1					
Size	–0.76	0.45	–0.82	0.26	1				
Inside	0.35	–0.15	0.34	–0.06	–0.40	1			
InstOwn	–0.44	0.28	–0.48	0.27	0.58	–0.35	1		
Analyst	–0.08	0.07	–0.10	0.06	0.12	–0.04	0.16	1	
Consensus	–0.09	0.08	–0.11	0.04	0.16	–0.04	0.18	0.89	1

Table 3 – Cross-Sectional Associations with Conference Call Frequency
This table tests the cross-sectional association between PINs (PIN parameters) in period t and the number of conference calls made by each firm in period $t\text{-}1$. Periods are calendar quarters. *Size* is the natural log of market value at the beginning of quarter t. *Inside* is the ratio of shares and derivatives owned by insiders to the number of shares outstanding. *InstOwn* is the proportion of outstanding shares owned by institutional shareholders. *Analysts* is the number of analysts making earnings forecasts during quarter t. *Consensus* = $ln(1+1/STD)$ where *STD* is the standard deviation of EPS forecasts, averaged over the quarter. Other variable definitions are in Table 1. All regressions include stock exchange indicators and industry indicators based on Fama and French (1997). Pooled regression with data from all quarters includes calendar quarter indicators. Samples exclude outliers having studentized residuals with absolute value > 3. Huber-White t-statistics are presented below the coefficients. *, **, *** denote significance at the 5%, 1%, and 0.1% levels, respectively (one-tailed test).

Panel A – Using PINs as the dependent variable

	Calls	Size	Inside	InstOwn	Analysts	Consensus	R^2 (%)	n
Predicted sign	–	–	+	+	–	–		
Pooled sample	–0.59***	–2.91***	1.48***	0.28*	–0.17***	0.13	58.5	33,571
t-statistic	*–14.27*	*–142.54*	*13.36*	*2.05*	*–16.86*	*11.55*		
Q2 1999	–0.30*	–2.56***	1.96***	0.31	–0.07*	0.07	52.6	2,698
	–1.94	*–35.71*	*4.58*	*0.65*	*–2.14*	*1.77*		
Q3 1999	–0.54***	–2.78***	1.95***	1.68***	–0.07*	0.02	55.7	2,838
	–3.93	*–37.90*	*5.00*	*3.46*	*–2.26*	*0.66*		
Q4 1999	–0.79***	–2.82***	0.94**	0.28	–0.09**	0.06	56.2	3,006
	–5.90	*–41.03*	*2.51*	*0.59*	*–3.02*	*1.58*		
Q1 2000	–0.56***	–2.48***	1.47***	0.55	–0.14***	0.12	55.6	2,966
	–4.28	*–39.41*	*4.35*	*1.20*	*–4.29*	*3.58*		
Q2 2000	–0.72***	–3.03***	1.60***	0.84*	–0.07*	0.04	63.0	3,035
	–5.52	*–47.66*	*4.94*	*1.99*	*–2.26*	*1.27*		
Q3 2000	–0.58***	–3.00***	2.10***	2.43***	–0.13***	0.09	57.7	3,069
	–4.08	*–45.91*	*5.79*	*5.32*	*–3.90*	*2.34*		
Q4 2000	–0.91***	–3.00***	1.66***	1.13**	–0.23***	0.20	58.3	3,167
	–6.17	*–45.26*	*4.55*	*2.52*	*–6.46*	*5.29*		
Q1 2001	–0.77***	–2.90***	1.41***	–0.11	–0.24***	0.15	60.7	3,298
	–5.31	*–44.80*	*3.71*	*–0.23*	*–6.77*	*3.88*		
Q2 2001	–0.45***	–3.34***	1.11**	0.39	–0.23***	0.19	62.2	3,157
	–3.15	*–44.99*	*2.84*	*0.81*	*–6.81*	*4.84*		
Q3 2001	–0.60***	–3.15***	1.06***	–1.13	–0.21***	0.18	65.3	3,185
	–4.92	*–45.67*	*3.04*	*–2.79*	*–6.74*	*5.03*		
Q4 2001	–0.58***	–3.14***	0.97**	–1.18	–0.29***	0.25	63.7	3,139
	–3.94	*–44.80*	*2.69*	*–2.58*	*–9.43*	*6.48*		

Table 3 – Cross-Sectional Associations with Conference Call Frequency – continued

Panel B – Using the PIN parameters as the dependent variables
Results based on a pooled sample with data from all calendar quarters.

	Calls	Size	Inside	InstOwn	Analysts	Consensus	R^2 (%)	n
Predicted sign	−	−	+	+	−	−		
α - Probability (in %) of a private information event	0.49	3.42	−0.64	1.88***	0.12	−0.09***	31.4	36,443
	5.70	*85.09*	*−3.17*	*7.07*	*5.71*	*−4.32*		
$\ln(\mu/\varepsilon)$ – Relative amount of informed trading	−0.05***	−0.32***	0.14***	0.01	−0.02***	0.02	75.0	36,250
	−17.93	*−225.72*	*18.10*	*1.38*	*−26.09*	*22.12*		

Table 4 – Time-series tests around conference call initiations

This table shows results of analyzing whether PINs (PIN parameters) decrease subsequent to a firm's initial conference call. An initiation event is determined as a conference call that was preceded no call activity in the preceding 13 months. PINs are estimated over 13 week periods, with three pre-initiation and three post-initiation periods. The initiation period of seven calendar days centered on the initiation event is excluded from the analysis. *PostInitiation* = 1 if the period is after the initiation event. *Time* is a continuous variable for the calendar date of the initial conference call. Data spans 14 calendar quarters from January, 1999 through June, 2002. Huber-White t-statistics reported below coefficients. *, **, *** denote respectively significant coefficients at the 5%, 1%, and 0.1% levels (one-tailed test).

Panel A: Using PINs (in %) as the dependent variable

Model	Sample Includes		Constant	Post Initiation	Time	R^2 (%)	n
Predicted sign[‡]				–			
1.	All firm-periods with data	Coefficient	20.1	–1.26***	0.29	0.63	8,333
		t-statistic	*60.78*	*–5.33*	*6.91*		
2.	All firm-periods with data[9]	Coefficient	13.5	–1.24***	quarterly	1.75	8,333
		t-statistic	*2.06*	*–5.11*	indicators		
3.	Firms with calls in post-initiation periods	Coefficient	20.1	–0.83**	0.19	0.24	6,378
		t-statistic	*51.80*	*–2.97*	*3.72*		
4.	Include only firms that have calls in period +1[†]	Coefficient	19.9	–0.99**	0.15	0.20	3,540
		t-statistic	*39.15*	*–2.56*	*2.21*		
5	Firms with zero calls in post-initiation periods	Coefficient	23.1	–0.32	0.13	0.14	1,955
		t-statistic	*34.21*	*–0.67*	*1.67*		

[‡] Predicted sign does not apply to Model 5, which has a predicted coefficient of zero.
[9] Time is replaced by calendar quarter indicator variables that correspond to the initial call date.
[†] Post-initiation period excludes period +1 to ensure that call information is available to market.

Panel B: Using the PIN parameters as the dependent variable

Model	Dependent variable		Constant	Post Initiation	Time	R^2 (%)	n
Predicted sign				–			
1.	α – Probability (in %) of a private information event	Coefficient	45.9	1.63***	0.34	1.17	8,333
		t-statistic	*92.93*	*4.63*	*5.41*		
2.	$Ln(\mu/\varepsilon)$ – Relative amount of informed trading	Coefficient	–0.63	–0.12***	0.01	0.55	8,333
		t-statistic	*–25.83*	*–6.79*	*2.89*		