Informed Trading Around The World

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Abstract

This study exploits a rich, newly available Global TAQTIC dataset to examine whether and how informed trading and stock price informativeness vary across 27,042 firms from 42 countries worldwide for the period 1996 to 2007. Results show strong evidence of a cross-country variation in informed trading and its role in stock price informativeness. Contrary to the prevailing view, informed trading is more pronounced in emerging than in developed markets. Stock prices, however, are more informative in the developed than in the emerging markets. Varying degrees of financial transparency contribute to these cross-market differences in the level of informed trading and stock price informativeness. Specifically, increasing financial transparency at both firm and country levels helps reduce informed trading but increase price informativeness. Further analysis suggests that while both informed trading and public information enhance price informativeness significantly, private information is a more important source of overall information in emerging than in developed markets.

Keywords: International Financial Markets, Informed Trading, PIN, Price Informativeness

JEL Classification Number: G11, G12, G23

1 Introduction

Informed trading plays an important role in security price behavior. Economic theory analyzes how asymmetric information among informed and uninformed traders could impact stock prices.[1] The literature argues that asymmetric information induces adverse selection in securities markets. The adverse selection problem causes market liquidity to deteriorate, and in severe situations, informed traders could drive out liquidity traders. This problem also induces uninformed traders to demand compensation for the risk of trading against informed investors who have private information.[2]

The literature, on the other hand, argues that more informed trading could enhance informational efficiency of the market by allowing more firm-specific information to be capitalized into stock prices. Roll (1988), in particular, contends that risk arbitrage activities of informed traders can be the primary cause of firm-specific stock price movements. Morck, Yeung, and Yu (2000, MYY) employ Roll's notion of firm-specific return variation (i.e, $1 - R^2$) as a measure of stock price informativeness, and show that prices are more informative in developed than in emerging markets. They attribute this finding to the poor protection of property rights in emerging markets that discourages informed risk arbitrage activities. While MYY present intriguing cross-country variation in the degree of stock price informativeness, their study provides no direct link between informed trading and price informativeness.

To the extent that informed trading exists, our study investigates whether and how informed trading varies across different firms and different countries around the world. We explore what firm fundamentals, financial accounting measures as well as macro information infrastructures and institutional factors can possibly drive the cross-country variation in private information-based trading. Any cross-country evidence will give us a better understanding of the underlying drivers behind the varying levels of informed trading across different international equity markets.

More importantly, our study further tests whether informed trading improves informational efficiency by examining the link between informed trading and stock price informativeness (as

[1] See, for example, Grossman (1976), Grossman and Stiglitz (1980), Kyle (1985), Glosten and Milgrom (1985), Admati and Pfleiderer (1988), Wang (1993), and Easley and O'Hara (2004).

[2] Brennan and Subrahmanyam (1996) and Huang and Stoll (1997), among others, provide empirical evidence that adverse selection reduces market liquidity and increases expected returns.

measured by MYY's $1-R^2$) and whether this link differs between emerging and developed markets.[3] Firm-specific information about fundamentals, as widely recognized, can be incorporated into stock prices through either public information or the trading activity of informed investors who have private information.[4] Thus the composition of private and public information in a market ought to determine the link between stock price informativeness and informed trading. MYY argue that poor protection of property rights may discourage informed trading in emerging markets, while we argue that the opacity of these markets may facilitate private information-based trading. Our empirical framework allows us to differentiate whether and how law enforcement (a proxy for investor protection of property rights) or the level of opacity of a country affects informed trading as well as its relationship with stock price informativeness.

We exploit a newly available Global TAQTIC dataset to estimate the level of informed trading for 27,042 firms from 22 developed and 20 emerging countries over a 12-year period 1996 to 2007. To the best of our knowledge, the current study represents the first to examine the varying degrees of informed trading for this large cross-section of international firms. Our analysis employs the probability of informed trading (PIN), developed by Easley, Kiefer, and O'Hara (1997, EKO), as a proxy for informed trading.[5] Our study documents several important findings.

First, we find significantly more informed trading in emerging markets than in developed markets. On average, PIN is 0.314 in emerging markets, compared with 0.284 in developed markets. On the other hand, firm-specific stock return variation ψ, a proxy for stock price informativeness, is lower in emerging than in developed markets. Taken together, these observations contradict MYY's conjecture that the poor protection of property rights in emerging markets discourages risk arbitrage activities, thereby reducing the level of firm-specific stock return variation. We show

[3]While there are conflicting views on the information implication of the R^2 statistic, our interpretation follows the growing empirical literature, including Durnev et al. (2003, 2004), Ferreira and Laux (2007), Jin and Myers (2006), Wurgler (2000), among others, that links $1-R^2$ to informative stock prices.

[4]We define informed trading in the spirit of Easley et al. (1998a, p.179). Specifically, an information event is classified as public if it does not affect trading, and private if otherwise. A seemingly public information event may contain a private component and therefore affect trading. Such an event is considered as a private information event in our framework. Consistent with this interpretation of informed trading, Vega (2006) provides empirical evidence that informed traders' superior information set can be derived either from private channels or from superior interpretation of public announcements.

[5]Intuitively, PIN measures the fraction of orders that arise from informed traders relative to the overall order flow. It takes into account patterns in the number of trades, but not trade size. Easley et al. (2002) show that trade volume reveals little information beyond the number of trades, suggesting that PIN is an adequate proxy for the degree of informed trading.

how and why country- and firm-level information environments can explain the varying degrees of informed trading and of stock price informativeness across different financial markets, especially across emerging and developed markets.

The intensity of informed trading depends on the quality of information environments. Whether improving information environments encourages the gathering and collection of private information or crowds it out depends on the trade-off between benefits and costs of private information acquisitions (Verrecchia, 2001). Our results show that financial transparency reduces informed trading, but enhances stock price informativeness in a country. The finding is robust to various proxies of country-level financial transparency, and is further confirmed based on a firm-level analysis using several firm-level financial transparency proxies. Specifically, informed trading increases in earnings opacity and in analyst forecast dispersion and errors, but decreases in analyst coverage. In contrast, stock price informativeness decreases in earnings opacity and in analyst forecast dispersion and errors, but increases in analyst coverage. A one-standard-deviation increase in both firm- and country-level financial transparency can lead to as much as 13.9% decrease in the level of informed trading and a 25.5% increase in price informativeness. These findings suggest that while financial transparency crowds out private information acquisitions, it also allows more firm-specific public information to be reflected in stock prices, leading to a more informative pricing.

Second, our analysis provides evidence consistent with the theoretical prediction that informed trading promotes informative stock pricing. Specifically, we document that PIN and ψ are positively correlated in all countries. Their correlation ranges from 0.075 for Greece to 0.496 for Portugal, with a world average correlation coefficient of 0.306. Cross-country multivariate regressions further corroborate this finding that PIN is significantly and positively related to price informativeness ψ.

Third, our results suggest that both public information (as implied by a higher level of financial transparency) and private information-based trading (as proxied by PIN) contribute significantly to the degree of price informativeness ψ in international equity markets. Interestingly, the association between PIN and ψ is stronger in emerging than in developed markets. This finding is consistent with the perceived view that emerging markets are typically opaque and have less public information available, and as a result, private information is a more important source of overall

information in these economies. A one-standard-deviation increase in PIN can produce as much as 7.8% rise in ψ, while the same amount of increase in the level of financial transparency proxy leads to a 14.2% increase in ψ. Furthermore, PIN could have an incremental 9.2% effect on ψ in emerging countries relative to developed countries.

Finally, our cross-country analysis of PIN not only provides substantial insights into what kind of firms and environments are linked to a higher level of information asymmetry, but also bears implications on how such information asymmetry can be effectively reduced. In particular, we show that PIN decreases in firm size, turnover, stock return volatility, $MSCI$ index membership, and financial transparency, but increases in book-to-market ratio, bid-ask spread, profitability, GDP growth volatility, and stock market development. Of particular interest is that improving financial transparency appears to be an effective means of lowering information asymmetry. However, expanding analyst coverage, as opposed to improving earnings quality, appears to be a more effective approach to mitigating information asymmetry associated with firms from more opaque economies or developing economies. This is possibly due to the lack of credible accounting numbers in emerging markets, in general.[6] Alternatively, these results also imply that different policies may have to be implemented to improve the information environments of emerging and developed markets, whose information infrastructures and institutional features are vastly different.

Our study is closely related to the studies of Aslan et al. (2007) and Bardong, Bartram, and Yadav (2008). Both studies link PIN to firm characteristics, but their focuses are different from ours. Aslan et al. emphasize the derivation of a proxy for PIN to study the role of informed trading in asset pricing for longer time periods, whereas Bardong et al. examine the commonality of informed trading and its asset pricing implications. Both studies focus only on the U.S. market that has a well-developed information infrastructure and financial accounting system, while we investigate firms from a cross-section of 42 countries, which differ substantially in their information infrastructure, institutional characteristics, and economic and financial development.

Our research contributes to several strands of finance and accounting literatures. First, our work

[6] Anecdotal evidence suggests accounting numbers are indeed more dubious in emerging markets. For example, a *Wall Street Journal* article on August 14, 2008, titled "Big China Retailer's IPO Held Up by Concerns on Financial Reporting" reports that the Chinese apparel retailer had to suspend its IPO due to apparent inconsistency between its stated sales figures and sales activities in its retail outlets, even though the IPO was underwritten by a group of reputable underwriters, including Goldman Sachs, Morgan Stanley, Merrill Lynch, and Deutsche Bank.

expands existing empirical research that examines the determinants and consequences of informed trading. Informed trading is shown to increase in the dispersion of market participants' beliefs and in noisy public announcements (Pasquariello and Vega, 2008), but to decrease in antitakeover provisions (Ferreira and Laux, 2007), analyst conference calls (Brown, Hillegeist, and Lo, 2004), and corporate disclosure quality (Brown and Hillegeist, 2007). Furthermore, informed trading is shown to contribute to cross-country differences in reaction to news announcements (Griffin et al., 2008) and in stock picking intensity (Bhattacharya and Galpin, 2007), and could be the primary cause of the daily return autocorrelation pattern in the U.S. (Llorente et al., 2002). Our research further shows that informed trading contributes to cross-country differences in stock price informativeness, and the results suggest several additional channels through which informed trading can be intensified or mitigated.

Second, our study also offers significant insights into the usefulness of firm-specific return variation ψ as a measure of stock price informativeness and sometimes as a specific proxy of informed trading.[7] In particular, we show that ψ is significantly related to firm- and country-level information environments and that it varies with the composition of public information (via accounting and country disclosures) and private information (via informed trading). For instance, ψ reflects more private information in emerging markets than in developed markets. Therefore, it is necessary that one carefully controls for cross-sectional differences in the amount of public information before making any valid inference about the extent to which a specific information event is linked to informed trading, as measured by ψ.

Lastly, our analysis adds to a growing empirical literature that successfully applies PIN to explaining various information-based regularities. This measure is used to study informed trading across different markets (Easley et al., 1998b) and types of securities (Easley et al., 1996), the stock price reaction to public and private news surprises (Vega, 2006), the information effect of IPO underpricing (Ellul and Pagano, 2007), the corporate investment sensitivity to stock prices (Chen, Goldstein, and Jiang, 2007), among others. Our study contributes to this literature by employing PIN to investigate the varying degrees of informed trading around the world and to

[7] MYY, Jin and Myers (2006), Fernandes and Ferreira (2008), among others, adopt ψ as a proxy for stock price informativeness, while Chen et al. (2007), Ferreira and Laux (2007), among others, employ it as a proxy for informed trading.

establish a significant link between informed trading and stock price informativeness.

The remaining of the paper is organized as follows. Section 2 briefly describes the model for estimating PIN and summarizes its statistics for our sample of 27,042 firms from 42 countries worldwide. Section 3 describes the sample construction, and Section 4 examines the firm- and country-level analyses of informed trading. In Section 5, we examine whether there is any link between PIN and price informativeness. Section 6 concludes.

2 Measuring PIN Around the World

We employ EKO's structural microstructure model to estimate PIN for each stock in our sample. Under the assumption that informed trading results in abnormal and unbalanced order flows, PIN measures the probability of a trade that comes from an informed investor.

In the model, trades are executed by two groups of investors: informed and uninformed investors. According to independent Poisson processes, uninformed investors submit their buy (sell) orders at a daily rate ε_B (ε_S) for the purpose of liquidity needs or noise trading, while informed investors utilize their private information advantage to perform informed trading. At the beginning of each trading day, a private information event occurs with the daily probability α, where the probability that bad news happens is δ and the probability that good news happens is $1-\delta$. If good (bad) news occurs, informed investors execute buy (sell) orders at a daily rate μ. Given some history of trades, the estimation of the model's parameters can be used to construct the probability that an order is from an informed trader as follows.

$$PIN = \frac{\alpha\mu}{\alpha\mu + \varepsilon_S + \varepsilon_B}, \tag{1}$$

where $\alpha\mu + \varepsilon_S + \varepsilon_B$ is the daily arrival rate of all orders and $\alpha\mu$ is the arrival rate of information-based orders. Hence PIN measures the fraction of orders that arises from informed traders relative to the overall order flow. PIN increases with either the frequency of private information events α or the average daily trading intensity of informed investors μ, but decreases with the average daily trading intensity of uninformed traders.[8]

The set of parameters, $\theta = \{\alpha, \delta, \mu, \varepsilon_S, \varepsilon_B\}$, is estimated by maximizing the following likelihood

[8] A more detailed discussion of PIN is available in Easley et al. (1997) and Easley et al. (2002).

function,

$$L(\theta, B, S) = \prod_{t=1}^{T} L(\theta, B_t, S_t), \tag{2}$$

where T denotes the number of trading days in a year, and B_t (S_t) denotes the number of buy (sell) orders on day t. For a specific day t, the likelihood function is

$$\begin{aligned} L(\theta|B_t, S_t) &= (1-\alpha)e^{-\varepsilon_S}\frac{\varepsilon_S^{S_t}}{S_t!}e^{-\varepsilon_B}\frac{\varepsilon_B^{B_t}}{B_t!} + \alpha\delta e^{-(\varepsilon_S+\mu)}\frac{(\varepsilon_S+\mu)^{S_t}}{S_t!}e^{-\varepsilon_B}\frac{\varepsilon_B^{B_t}}{B_t!} \\ &\quad +\alpha(1-\delta)e^{-\varepsilon_S}\frac{\varepsilon_S^{S_t}}{S_t!}e^{-(\varepsilon_B+\mu)}\frac{(\varepsilon_B+\mu)^{B_t}}{B_t!}. \end{aligned} \tag{3}$$

2.1 Estimation of PIN

Our key data set, Global TAQTIC, contains all intra-day stock trades and quotes across 42 countries over a 12-year period January 2, 1996 to December 31, 2007.[9] Global TAQTIC is a historical market server, managed by Securities Industry Research Center of Asia-Pacific (SIRCA). SIRCA receives the original data directly from Reuters, and provides a full breadth of global intra-day trade, quote, and market depth data for stocks, financial derivatives, indices, bonds, funds, and foreign exchanges since January 2, 1996. Global TAQTIC has an equity coverage of 69 stock exchanges in 43 countries. For our study, we select all securities listed in a country's main exchange from 42 countries, but exclude Iceland, because there is no available firm- and country-level information for Iceland. For China, Japan, and the U.S., we include stocks listed in two major exchanges given their equal importance in the countries. The stock exchanges in our sample as well as the starting year of their automated trading are listed in Appendix A.

A recent study by Jain (2005) shows that automation generally reduces transaction costs but increases liquidity; such a trading system may encourage informed trading. However, only the stock exchanges of Ireland, Israel, the U.K., and the U.S.'s NYSE started automated trading after 1996. Our robustness tests show that excluding the non-automated trading years of these stock exchanges have no impact on our key results. Furthermore, we also control for the bid-ask spread and turnover throughout our empirical analysis, as well as country fixed effects, to take care of other cross-exchange differences in the trading system.

[9] Given the large volume of intra-day trade and quote data around the world, the compressed CSV files are about 300GB. We have spent almost a year in gathering this enormous set of data and in estimating annual PINs for every firm in the sample.

The initial sample covers 54,632 securities. We merge these securities with the Datastream database to obtain their basic firm-level information by using the codes provided by Reuters terminals. For those securities that cannot be matched by Reuters codes, we manually match them by firm names. In total, we are able to match 42,495 securities. Next, we apply filters provided by Datastream to eliminate ADRs, GDRs, warrants, trusts, funds, and non-equity securities from our sample. After filtering, our sample consists of 28,109 domestic stocks that belong to their respective major share class of firms and whose primary listings are in the main stock exchange(s) of the country.

When estimating PIN, we require trades and quotes submitted during the regular trading hours of each stock exchange. Global TAQTIC provides information on trade qualifiers. Thus, trades identified as irregular trades or with negative trading prices are excluded. For quotes, we eliminate those with bid-ask spreads that are greater than half their mid-point quote prices. We employ the Lee and Ready (1991) algorithm to identify buyer- or seller-initiated trades. If quotes are missing during a trading day, we use tick tests to classify trades and then the likelihood function (3) to estimate the yearly PIN parameters. To avoid corner and local optimal solutions, we try a set of 1,600 initial values for each maximization algorithm and obtain full estimation coverage of our sample.[10] Finally, we exclude observations with PIN equal zero or one, and these observations constitute on average about 6% of our total sample size. As a result, our final sample covers 27,042 firms across 42 countries.

Panel A of Table 1 presents the distribution of PIN by country, and Panel B shows that of its components. We estimate PIN for each firm-year across a sample of 17,396 firms from 22 developed countries and 9,646 firms from 20 emerging countries. For the majority of countries, the sample period is between 1996 and 2007. The exceptions are Ireland (period: 2000-2007), Luxembourg (period:1998-2007), Poland (period: 2000-2007) and Saudi Arabia (period: 2001-2007). The number of firms in each country is generally proportional to the size of its economy. The U.S., U.K., Germany, and Japan have the largest number of firms in our sample, whereas Luxembourg and Ireland have the smallest. Remarkably, emerging economies such as India and

[10]There are five parameters needed to estimate PIN. We try five different initial values each for α and δ, and four different starting values for μ, ε_B, and ε_S. In total, the algorithm generates 1,600 ($5 \cdot 5 \cdot 4 \cdot 4 \cdot 4 = 1,600$) maximum likelihood values, and it picks the parameters associated with the largest maximum likelihood value.

China have over 1,000 firms in our sample.

The table shows interesting contrasts between developed and emerging markets. Emerging markets on average have a higher PIN (mean=0.314; median=0.291) than developed markets (mean=0.284; median=0.256). Both the t-test ($t = 4.61$) and Kruskal-Wallis test ($t = 23.42$) indicate that PIN is statistically different in developed and emerging markets. The probability of information events α is also slightly higher in emerging markets (mean = 0.245) than in developed markets (mean = 0.243), while there is no discernable difference in their probabilities of bad news events δ. Interestingly, emerging markets in general have more informed traders as well as liquidity traders than do developed markets. The average μ, ε_B, and ε_S are, respectively, 80.423, 50.467, and 61.521 for emerging markets, and 55.223, 41.843, and 45.210 for developed markets.

Among the developed markets, the U.S. has the smallest PIN of 0.185,[11] while among the emerging markets, China has the smallest PIN of 0.174.[12] Countries such as Chile ($PIN = 0.424$), Indonesia ($PIN = 0.407$) and Argentina ($PIN = 0.403$) have a relatively high PIN, and Taiwan ($\alpha = 0.437$), China ($\alpha = 0.415$), New Zealand ($\alpha = 0.333$), Korea ($\alpha = 0.317$), and the U.S. ($\alpha = 0.296$) exhibit a relatively high α. δ shows a moderate cross-country variation, ranging from 0.208 for Turkey to 0.517 for India. Countries with relatively high (low) μ also tend to have relatively high (low) ε_B and ε_S. For example, Saudi Arabia, China, and Korea all have a high level of μ, ε_B, and ε_S. Luxembourg and New Zealand, however, show an opposite pattern; they have small values of μ, ε_B, and ε_S.

3 Construction of Variables and their Predicted Relationships with PIN

This study uses data from several different sources. Besides the Global TAQTIC described in the previous section, we use (a) weekly and monthly stock returns from Datastream,[13] (b) firm-specific

[11] Our estimate of PIN for the U.S. is close to that reported by Easley et al. (2002), where they show the average (median) PIN for NYSE-listed stocks is 0.191 (0.185) over the period 1983-1998.

[12] Our PIN estimate for China is in line with that of Chan, Menkveld, and Yang (2008). They document that PIN is, on average, 0.13 and 0.20 for their small sample of 76 Chinese A and B shares for the year 2000.

[13] To filter out the recording errors in Datastream, for the monthly and weekly returns we adopt the screen suggested by Ince and Porter (2006) and discard observations if $(1 + R_{i,t}) \cdot (1 + R_{i,t-1}) \leq 0.5$, where $R_{i,t}$ and $R_{i,t-1}$ are the stock returns of firm i in month (or week) t and $t-1$, respectively, and at least one is greater than or equal to 300%. In addition, in view of Datastream's practice to set the return index to a constant once a stock ceases trading, we treat those constant values as missing values in the inactive file.

and country financial variables from Worldscope, International I/B/E/S, and World Development Indicators, and (c) mutual fund stockholdings from Thomson Reuters. In subsequent subsections, we describe the summary statistics of firm- and country-level characteristics as well as their predicted relationships with PIN. The detailed definition and data source for each variable are provided in Appendix B.

3.1 Firm Characteristics

Drawn from existing literature, we employ several firm-level characteristics to examine their differential impacts on PIN. For convenience of discussion, we classify them into eight categories. Panel A of Table 2 reports the cross-country distribution of these variables, with their averages for emerging markets EMG, developed markets DEV, and the world reported at the bottom of the panel.

(i) *Basic characteristics*

We consider five basic firm characteristics: firm size ($Size$), book-to-market equity ratio (BM), firm age (Age), dividend yield (DY), and debt-to-equity ratio (DE). Large firms may have greater benefits to voluntarily disclose more information to the public (Diamond and Verrecchia, 1991). High BM firms may have a high default probability and thus subject to more speculative trades, or have a lower growth option and therefore easier to value. Thus the direction of the relationship between BM and PIN is ambiguous. We expect less private information about older than younger firms, and therefore the former would be associated with lower information asymmetry, compared with the latter. Low DY firms may have a higher growth option (based on the pecking order theory of financing), or have a more severe agency problem (La Porta et al., 2000). If it is the latter, low DY firms may discourage the collection of private information. High DE firms generally face a higher default risk but may opt for a higher level of disclosure (Francis, Khurana, and Pereira, 2005), making the relationship between DE and PIN an empirical question.

(ii) *Stock liquidity*

We consider two liquidity proxies: Turnover ratio ($Turn$) and relative bid-ask spread ($Sprd$).

Easley et al. (1996) show that high turnover stocks are associated with low informed trading or PIN. The bid-ask spread is a proxy for the overall liquidity of a stock or the transaction cost of trading. Smaller transaction costs are likely to stimulate the trading activities of both risk arbitragers and discretionary liquidity traders (Admati and Pfleiderer, 1988). But Duarte and Young (2008) argue that there exists a significant liquidity component in PIN. Therefore, the relationship between PIN and $Sprd$ is not clear.

(iii) *Firm growth*

We use the historical net sales growth (g_{Sales}) as a proxy for a firm's growth potential. As argued earlier, a low growth option may result in a low level of information asymmetry. However, growth firms may also opt for more disclosure to attract investors to raise more external financing. Thus there is no clear predicted direction for sales growth and PIN.

(iv) *Firm performance and risk*

We consider two performance measures - historical stock returns (Ret) and the return on equity ratio (RE), and two measures of firm risk - stock return volatility (σ_{Ret}) and operating income volatility (σ_{Inc}). Informed traders may seek out profitable firms for buying opportunities. Firms with greater stock return volatility, however, may lower information precision of traders. In contrast, more uncertainty about a firm's fundamentals, as proxied by σ_{Inc}, could encourage informed trading if traders have superior information about them. We therefore predict that Ret, RE, and σ_{Inc} have a positive, while σ_{Ret} has a negative, relationship with PIN.

(v) *Indexation*

Stocks with $MSCI$ index membership tend to be visible globally and would attract a relatively large number of uninformed traders. In this case, $MSCI$ index membership would be associated with a low PIN.

(vi) *Earnings opacity*

Leuz, Nanda, and Wysocki (2003) suggest three measures of earnings management to capture various dimensions along which insiders can exercise their discretion to manage reported earnings. Our analysis include these measures: the magnitude of accruals ($Accr$), earnings

smoothing ($Smth$), and earnings correlation ($Corr$). $Accr$ measures the extent to which insiders exercise discretion in the accounting component of reported earnings, namely accruals; $Smth$ measures the extent to which insiders reduce the variability of reported earnings by altering the accruals. $Corr$ measures the correlation between the change in accruals and operating cash flows, and therefore captures the extent to which managers use their accounting discretion to conceal economic shocks to their firm's cash flows from operations. Earnings opacity increases in $Accr$, but decreases in $Smth$ and $Corr$. We expect a positive relation between PIN and $Accr$, but a negative relation between PIN and both $Smth$ and $Corr$.

(vii) *Analyst variables*

We employ three analyst variables: the number of financial analysts covering a firm ($Alyst$), analyst forecast dispersion ($Disp$), and analyst forecast errors ($FErr$). More analyst coverage improves the transparency of a firm by allowing firm-specific information to disseminate in a more timely manner (Hong, Lim, and Stein, 2000). High $Disp$ and $FErr$ may suggest low transparency or high uncertainty about a firm's future earnings and cash flows. We expect a negative relationship between PIN and $Alyst$ but a positive relationship between PIN and both $Disp$ and $FErr$.

(viii) *Insider ownership and institutional holdings and trading*

Our study includes insider ownership ($Close$), as well as the holdings (I_{DH} and I_{FH}) and trading (I_{DT} and I_{FT}) of domestic and foreign mutual funds. Given the limited data on institutional ownership in international markets, we only employ the information on international mutual funds that are available to us. Greater ownership stake ($Close$) may reduce insiders' incentives to expropriate outside investors (Durnev and Kim, 2005), thus promoting risk arbitrage activities.[14] Also, more institutional ownership may imply greater monitoring of a firm's performance and hence improving its corporate governance, thereby encouraging informed trading. Institutional trading, in general, contains information (Chen, Jegadeesh, and Wermers, 2000), but it is debatable whether foreigners are informed.[15]

[14]Our data do not permit us to derive the extent of insider trading for our sample firms. To the extent that insider trading is positively correlated with insider ownership, if insiders are informed, we would expect a positive relationship between PIN and $Close$.

[15]For example, Froot, O'Connell, and Seasholes (2001) and Grinblatt and Keloharju (2001) show that foreign investors are informed, while Brennan and Cao (1997) and Choe, Kho, and Stulz (2005) suggest otherwise.

Panel A of Table 2 reveals a few interesting patterns. Firms from developed markets tend to be larger, older, and have smaller BM but larger DY and DE than their counterparts from emerging markets. Furthermore, the former also tend to exhibit a smaller $Sprd$, less σ_{Ret}, a much lower level of earnings opacity (i.e., $Disp$, and $FErr$) but a greater $Alyst$ than the latter. Remarkably, China has the lowest BM ratio among all countries, possibly reflecting its booming stock market valuation during our sample period. Furthermore, about 49% of the shares across the world are closely held, but about 2.34% and 1.87% of the world shares are held by domestic and foreign funds, respectively.

The correlation matrix in Panel A of Appendix C shows that informed trading PIN is more pronounced in smaller, high book-to-market ratio, younger, and illiquid firms. Firms with more earnings management, less analyst coverage, and higher analyst forecast dispersion and errors also have a higher PIN. Most firm-level variables have moderate correlation coefficients, with only correlation coefficients of $Size$ and $Alyst$ and of $Smth$ and $Corr$ slightly exceeding 0.5.

3.2 Country Characteristics

We employ seven categories of country-level characteristics. Panel B of Table 2 presents their summary statistics and Panel B of Appendix C shows their pairwise correlation.

(i) *Economic and financial development*

We include GDP per capita ($GDPC$), the stock market capitalization to GDP ($MCap$), and private credit to GDP ($Credit$) as measures of a country's economic and financial development. Richer countries (those with large $GDPC$) tend to have better protection of property rights, and MYY argue that such countries are generally more conducive to informed trading than poorer countries. We, however, argue that poorer countries, particularly emerging markets, have weak information environments and are less transparent. These information environments could foster private information-based trading.

Levine (2002) argues that better developed equity markets (large $MCap$) can facilitate risk diversification and management, thus encouraging more informed trading. On the other hand, he argues that powerful banking industry may foster stronger bank-firm ties, and such ties can

impede the efficiency of a firm's corporate governance. Alternatively, the strong bank-firm relationship may arguably enhance investment and capital allocation efficiency. Therefore, the relationship between PIN and $Credit$ (a proxy for the development of the banking industry) is unclear.

(ii) *Economic growth*

While informed traders may seek out profitable buying opportunities in fast growing economies, as proxied by GDP growth (g_{GDP}), these economies may take measures to attract more foreign capital by enhancing their overall transparency. The latter may reduce the incentives for investors to gather private information, thus resulting in a lower PIN.

(iii) *Economic and financial risk*

We measure economic risk by GDP growth volatility (σ_{GDP}) and financial risk by stock market volatility (σ_{Mkt}). As we argue earlier, stock market return volatility may lower the information precision of informed investors, leading to a lower PIN. In contrast, greater uncertainties about fundamentals, such as the future GDP growth, could create opportunities for informed traders to profit from their superior information. But a potentially offsetting effect is that trading costs could be larger in such environments.

(iv) *Economic and financial integration*

We use the sum of foreign direct investment inflows and outflows with the U.S. scaled by GDP to proxy for a country's economic integration (FDI) with the rest of the world. A high degree of FDI can facilitate the convergence of domestic corporate governance to the global level and possibly be conducive to informed trading. We also employ the segmentation measure (Seg) proposed by Bekaert et al. (2007) as a proxy for a country's financial integration with the world. Greater financial integration (i.e., lower Seg) may enhance market transparency, in general, therefore reducing PIN.

(v) *Law enforcement*

A good quality of rule of law is likely to promote informed risk arbitrage (MYY, 2000, p. 248). Based on this argument, we expect a positive relation between rule of law and PIN.

(vi) *Financial disclosure environment*

We use four alternative proxies to account for the intensity and timeliness of the disclosure of accounting information in a country. The measures include the financial transparency index ($FTran$) from Bushman et al. (2004), accounting standards index ($AcStd$) from La Porta et al. (1998), disclosure requirement index ($DReq$) from La Porta et al. (2006), and disclosure score index ($Disc$) from Gelos and Wei (2005). Intuitively, more financial transparency decreases the amount of private information available and therefore leads to a lower PIN in the market. Because these four proxies measure similar quality of an information environment, we use only one of them at a time in our empirical analysis.

(vii) *Corporate governance environment*

We use two alternative proxies for corporate governance transparency: the governance transparency index ($GTran$) from Bushman et al. (2004) and anti-self-dealing index ($Antsel$) from Djankov et al. (2008). A higher $GTran$ score indicates more disclosure on shareholdings and remuneration of firms' insiders and major shareholders. A higher $Antsel$ score indicates more disclosure on the approval process of a firm's self-dealing transactions, as well as greater ease with which to hold corporate insiders responsible through litigation. A better corporate governance is likely to encourage the collection of private information. We employ these two alternative proxies, separately, in our analysis.

Panel B of Table 2 show that developed markets have substantially higher $GDPC$, $MCap$, and $Credit$ than emerging markets. The former also have better law enforcement, a higher degree of financial transparency, and better governance transparency. Smaller economies, such as Luxembourg, Belgium, Hong Kong, and Singapore, tend to promote foreign direct investment. On the contrary, economies such as Japan and Saudi Arabia are relatively closed. China and India exhibit the highest real GDP growth (g_{GDP}), while Japan and Italy show the lowest. The Seg measure suggests that the U.S. and Switzerland are the least segmented, while Korea and Thailand are the most.

Panel B of Appendix C shows that PIN is higher in countries with lower GDP per capita but with more volatile GDP growth prospects. PIN is negatively correlated with financial transparency, but positively correlated with governance transparency. As expected, the four financial

transparency proxies are highly correlated with one another. The two corporate governance indexes also have a relatively high correlation of 0.53.

4 What Drives Informed Trading (PIN) Around the World?

As discussed in the introduction section, theoretical research examines how the existence of informed traders introduces information asymmetry and hence induces adverse selection in securities markets. The natural questions that arise are what kind of a firm's information environment and what type of a country's information infrastructure and institutional environments are linked to greater information asymmetry or more informed trading of a stock. The answers to these questions would bear implications on how information asymmetry among investors could be effectively reduced.

4.1 Firm-level analysis

Table 3 presents cross-country regression results of different model specifications. In Models (1)-(10), PIN is regressed on each set of firm-specific variables alone, and in Models (11)-(14), it is regressed on combinations of these firm-specific variables. All regression models include untabulated year and country effects, and all robust $t-$statistics reported are adjusted for heteroskedasticity and clustered standard errors at the firm level.

Several notable observations emerge from Table 3. It is evident that firm-specific characteristics play a significant role in explaining the cross-section of firm-level PINs. The $\bar{R}^2$ value ranges from 9.1% (Model 10) to 25.6% (Models 11-12). Of particular interest is that PIN increases in earnings opacity and analyst forecast dispersion, while decreases in analyst coverage. For example, Model (8) shows that the estimated coefficients for $Accr$, $Smth$, and $Corr$ are, respectively, 0.219 ($t = 10.68$), -0.282 ($t = -2.49$), and -0.448 ($t = -2.99$). Model (9) shows that the estimated coefficients for $Alyst$ and $Disp$ are -0.235 ($t = -22.03$) and 0.930 ($t = 4.18$). Increasing the transparency of a firm's information environment, via reducing earnings opacity or analyst forecast dispersion and through increasing analyst following, can materially impact the level of information asymmetry associated with the firm.

Firms with large $Size$ and low BM, on average, have low probabilities of information-based

trading, an indication that these firms are associated with a low degree of information asymmetry. $Turn$ has a negative effect, while $Sprd$ has a positive effect, on PIN. Their corresponding estimates from Model (3) are -0.052 ($t = -9.38$) and 1.149 ($t = 19.25$). These findings suggest that trades of high volume stocks generally contain less information and that $Sprd$ is positively related to the degree of information asymmetry. Other firm characteristics, such as Age, DY, and DE, however, are not robustly related to PIN.

Furthermore, PIN is positively related to Ret, RE, and σ_{Inc} but negatively related to σ_{Ret}. Informed traders seem to exploit potential buying opportunities in profitable firms and also actively trade on firms with larger operating income uncertainty. However, they are more likely to shy away from firms with greater stock return volatility. We find that $MSCI$ index firms are strongly and negatively related to PIN, suggesting that the global visibility of index membership lowers information asymmetry. For instance, the coefficient on $MSCI$ in Model (7) is -0.067 with a large $t-$statistic of -49.76, indicating that $MSCI$ plays a significant role in explaining the level of informed trading. Additionally, PIN is significantly and positively related to insider ownership and domestic institutional trading, but insignificantly associated with foreign institutional trading and holdings. The results suggest that domestic institutions, while not foreign institutions, are informed and that greater insider ownership promotes informed trading.

At this juncture, it is worthwhile to point out the differences in the number of firm-year observations across models presented in Table 3. The varying sample sizes are due to the availability of analyst variables and institutional holdings information. For example, adding analyst variables to the models reduces the number of firm-year observations from 100,141 in Model (12) to 51,332 in Model (13). The reason is that the I/B/E/S database focuses mainly on large firms and therefore excludes many firms covered in Global TAQTIC. When we consider institutional holdings and trading information in our analysis, our sample size is further reduced to 18,043 observations, less than a fifth of the original sample. Institutional data are from Thomson Reuter's mutual fund stockholding database, which covers only those firms held by international mutual funds. Nevertheless, our untabulated key results based on this small sample of firms remain qualitatively unchanged. To conserve space, in our subsequent analyses, we report results pertaining to our base Models (12)

and (13), which highlight the differences of the results with and without analyst variables.[16]

4.2 Country-level analysis

Table 4 presents the cross-country results of how the country-year median PIN is related to macro information infrastructure and institutional factors at the country level. Models (1)-(9) show the separate effect of each category of country characteristics on PIN, whereas Models (10)-(13) show their combined effects. All regression models include untabulated year effects, and all robust $t-$statistics reported are adjusted for Newey-West heteroskedasticity and serial correlation.

Similar to firm-level variables, country-level variables also exhibit varying influences on the cross-section of PIN, with $\bar{R}^2$ of between 5.9% in Model (2) and 36.2% in Model (10). Interestingly, PIN decreases in various measures of a country's financial disclosure environment. For example, from Models (10)-(13), the coefficient estimates of financial transparency proxies, $FTran$, $AcStd$, and $DReq$ are -0.030 ($t = -2.76$), -0.156 ($t = -2.32$), and -0.106 ($t = -2.82$), respectively. This implies that an effective way of reducing information asymmetry is to increase country-level financial transparency. Governance transparency also plays a role in explaining the level of informed trading. Coefficient estimates of governance transparency proxies, $GTran$ and $Antsel$, are positive and statistically significant at conventional levels. Countries with better corporate governance are likely to encourage investors to gather more private information.

Strikingly, evidence shows that PIN increases in low-income countries. The coefficient estimate of $GDPC$, a proxy for a country's economic development, is all negative and mainly statistically significant at the 10% level. This observation runs contrary to MYY's conjecture that poorer countries are likely associated with less trading by risk arbitrageurs. Moreover, PIN is also driven by other country characteristics. When estimated jointly, proxies of a country's economic and financial integration and rule of law play some role, while less robust, in explaining cross-country variation in PIN. $MCap$ has a positive impact on PIN, implying that stock market development facilitates risk diversification and management and therefore encourages risk arbitrage activities.

[16] Consistent with evidence of earnings opacity and analyst variables, untabulated results suggest that the S&P disclosure score, which measures the extent to which a firm discloses its accounting information, is significantly and negatively related to PIN. Our main analysis excludes this variable, because S&P only provides the disclosure score for a small subset of international firms (only 8,173 firm-year observations are available).

Also, the effect of g_{GDP} is positive, an indication that fast growing economies may have a desire to improve their information environment by reducing information asymmetry in order to attract foreign capital. In contrast, increasing *Credit* might reduce the quality of corporate governance and hence provide little incentive for investors to collect private information. Finally, the coefficients of σ_{GDP} and σ_{MKT} yield the predicted signs. Informed traders tend to avoid more volatile stock markets but are active in markets where fundamentals, such as GDP growth, are more uncertain.

4.3 Interactions of firm and country characteristics

In the preceding section, we have identified significant relationships between PIN and both firm and country characteristics. Further, the evidence suggests that the degree of information asymmetry can be reduced by external efforts of firms and governments, especially through promoting financial transparency at the firm and country levels. This section proceeds to examine whether firm or country characteristics are more important in explaining PIN and also whether proxies of firm- and country-level financial transparency are substitutes or complements. If they are substitutes, then it implies that firms even in opaque countries can act to mitigate their levels of information asymmetry.

As seen in Table 5, the interactions of firm and country variables yield two sets of models, with one set including analyst variables and another without. Each set of regression models includes (i) firm characteristics only; (ii) country characteristics only; (iii) both firm and country characteristics; and (iv) firm characteristics and country-fixed effects. Firm characteristics are the same as those of Models (12) and (13) in Table 3, and country characteristics are the same as those of Model (10) in Table 4.[17] To facilitate the comparison of results, all models consider only firm-year observations with no missing data and also include untabulated year effects. Table 5 reveals a number of interesting findings.

The $\bar{R}^2$ of Model (1) with only firm characteristics is 18.5%, compared with 7.2% of Model (2) with only country characteristics.[18] The $\bar{R}^2$ increases to 20.8% in Model (3) when country

[17] Recall that we use firm characteristics from Models (12) and (13) of Table 3 based on the sample size consideration. We use Model (10) of Table 4 as our base model for country characteristics, because it yields the largest $\bar{R}^2$ and also has the largest sample size.

[18] The untabulated results show that the $\bar{R}^2$s of the regression models with only year effects are 0.58% and 1.70%, respectively, for the sample without and with analyst coverage variables.

characteristics are added to firm characteristics, and to 25.0% in Model (4) when the country fixed-effects are added instead. Both firm and country characteristics have material impacts on PIN, but the firm characteristics exert a stronger influence than the country characteristics. Models (5)-(8) confirm the importance of both groups of characteristics in explaining PIN. For example, the $\bar{R}^2$ of Model (5) with firm characteristics and analyst variables is 11.3%, whereas that of Model (6) with country characteristics is 8.8%. Expanding Model (6) to include country characteristics (Model 7) or country fixed-effects (Model 8) does increase the $\bar{R}^2$ to 15.2% or 18.1%.

Results of Table 5 lend further support to our earlier evidence that enhancing financial transparency at the country level as well as reducing earnings opacity and improving analyst coverage at the firm level can help lower the degree of information asymmetry or PIN. For example, $FTran$, together with earnings opacity variables, particularly $Smth$ and $Corr$, are all negative and mostly statistically significant. Similarly, $Disp$ and $FErr$ yield mainly significantly positive, while $Alyst$ bears negative, coefficients. Estimates of Model (7) suggest that a one-standard-deviation increase in these proxies for firm- and country-level financial transparency can lead to as much as a 13.9% fall in PIN.

To the extent that both firm and country characteristics affect PIN significantly and that the quality of firm- and country-level information environments can be improved, it is interesting to examine the following questions. Are firm- and country-level financial transparency substitutes or complements? Can firms in opaque countries effectively reduce information asymmetry via firm-level measures? To address these questions, we expand our analysis of Table 5 by incorporating an emerging market dummy EMG and an opacity dummy OPA as well as their interaction effects, namely EMG×earnings opacity, EMG×analyst variables, OPA×earnings opacity, and OPA×analyst variables. EMG and OPA are proxies for country-level transparency, whereas earnings opacity ($Accr$, $Smth$, and $Corr$) and analyst variables ($Alyst$, $Disp$, and $FErr$) are proxies for firm-level transparency. Note that EMG is constructed based on a country's $GDPC$, and OPA is constructed based on $FTran$. In light of this, we employ the two dummy variables in place of $GDPC$ and $FTran$, and more importantly, using these dummies allows us to better differentiate the effects of emerging and opaque markets from those of developed and transparent markets. Evidence of these effects are presented in Table 6. The model specifications are similar to Models

(3)-(4) and (7)-(8) of Table 5. To conserve space, we highlight only the variables of interest, leaving the other firm- and country-level variables untabulated.

There is strong evidence that firms in opaque and emerging countries are generally associated with a high level of information asymmetry. Both EMG and OPA produce positive and mainly statistically significant coefficient estimates. On average, PIN is 17.9% (17.4%) higher for firms in emerging (opaque) countries, compared with their counterparts in developed (transparent) countries.[19] Further, the results show that whether firm- and country-level financial transparency are complements or substitutes depends on the proxies employed. We find that earnings opacity variables complement a country's level of transparency. PIN increases in earnings opacity, but the interaction effects of $EMG \times$ earnings opacity and $OPA \times$ earnings opacity are marginally significant with opposite signs. Conversely, analyst coverage can substitute for the transparency of a country. PIN decreases in analyst coverage, and effects of $EMG \times Alyst$ and $OPA \times Alyst$ are statistically significant and negative, with $EMG \times Alyst$ and $OPA \times Alyst$ of -0.118 ($t = -3.25$) and -0.095 ($t = -3.18$), respectively.

Overall, the evidence suggests that a more effective way of reducing information asymmetry of firms from emerging or opaque countries is by increasing analyst coverage rather than by reducing earnings opacity. This observation perhaps suggests that the market perceives accounting information from opaque emerging countries as less reliable. Alternatively, it also suggests that different policies may have to be implemented to improve the quality of information environment in emerging vs. developed markets.

4.4 Additional tests

We have established how and why PIN varies across different firms and countries worldwide. In this subsection, we perform several additional tests. We first provide further insights on whether information events and the arrival rates of informed and uninformed traders are related to the general environment of a firm. We therefore examine the relationships between PIN components (α, δ, μ, ε_S, and ε_B) and the same set of firm and country characteristics employed earlier. We

[19] The average PIN for the sample in Models (4) and (8) is 0.246, and the coefficient estimate of EMG is 0.044 and that of OPA is 0.043. These estimates suggest that PIN is 17.9% and 17.4% higher in firms from the respective emerging and opaque economies.

next show the robustness of our key findings by investigating our sample separately for the U.S. vs. non-U.S. markets, pre-2001 (inclusive) period vs. post-2001 period, and using the Fama-MacBeth method and weighted least square (WLS) approach.

In Table 7, we re-estimate Models (3) and (7) of Table 5, with each of the PIN parameters as the dependent variable. Several interesting observations emerge from the table. First, the probability of information events α is affected by the amount of private information available in the market and by the incentives of informed traders to collect private information. In particular, younger firms and firms with a lower *Sprd* and higher *Disp* tend to have a higher α. Generally, higher probability of information events occurs in countries with developed equity markets and stringent rule of law, but reduces in those with greater transparency.

Second, *Alyst* is positively related to α, suggesting that analysts help uncover private information or are skillful in interpreting public information. This finding differs from that of Easley, O'Hara, and Paperman (1998), who report insignificant differences in the α between U.S. firms of high and low analyst coverage. Their result, however, is based on a univariate analysis of a relatively short sample period from October to December 1991, while ours is based on a much longer and more recent sample period 1996 to 2007 covering a broad cross-section of 42 countries.

Third, the arrival rate of informed (μ) and uninformed traders (ε_S and ε_B) are driven by similar factors. For example, they both prefer larger and younger firms and firms whose stocks are more liquid, widely followed by analysts, and experience more volatile returns and have $MSCI$ index memberships. Further, μ, ε_S, and ε_B all increase in $MCap$, $Credit$, σ_{Mkt}, and g_{GDP}, but decrease in $GDPC$, $FTran$, and $GTran$. This is consistent with microstructure theory (e.g., Admati and Pfleiderer, 1988) that (discrepancy) liquidity traders and informed traders both prefer to trade when the market is thick and that liquidity-trading induces informed-trading. As a result, both types of traders concentrate their trades in the same market.[20] Furthermore, the regression $\bar{R}^2$ for the probability of bad news event (δ) is not surprisingly low with an average of about 3.19%, suggesting that bad news events are likely to occur in a random fashion.

Table 8 presents results of the robustness tests. The U.S. results, shown in Models (1)-(2), are

[20]In their model, the introduction of more informed traders improves the welfare of liquidity traders if the former observe the same private information. With diverse information, however, more informed traders may worsen the trades of and potentially drive out liquidity traders.

broadly consistent with those reported by Aslan et al. (2007). Specifically, PIN decreases in size, age, number of analyst coveraged, turnover, while increases in sales growth and profitability. They, however, find that PIN is positively related to BM but insignificantly related to $Accr$, while we find the former to be insignificant but the latter positively significant. The differences are likely due to the sample period difference. Their sample period covers 1983 to 1999, while ours is 1996 to 2007. The results of non-U.S. markets, as shown in Models (3)-(4), are consistent with those of the U.S., except for some noticeable differences. The net sales growth effect is mainly confined to the U.S. sample. On the other hand, the $MSCI$ index effect is much stronger in non-U.S. markets, suggesting that visibility induced by the $MSCI$ index membership plays a more important role in these markets.

Sub-sample results are depicted in Models (5)-(8). It is worthwhile emphasizing that the first sub-period is a more atypical period, which includes the 1997 Asian financial crisis, 1998 Russian financial crisis, and the late 1990s-2000 Internet bubble period. Thus, we expect the results to be weaker in this sub-period. The firm- and country-level variables can explain $14.1 - 17.1\%$ of cross-sectional variation of PIN during the first sub-period, compared with $16.2 - 24.3\%$ during the second sub-period. In addition, we observe that the coefficient estimates of earnings opacity, analyst variables, and financial transparency variables are more significant in the second than first sub-period. For example, the estimate of $FTran$ coefficient increases from -0.017 ($t = -4.75$) for the first sub-period in Model (6) to -0.033 ($t = -14.86$) for the second sub-period in Model (8). Other key variables are qualitatively the same across sub-periods.

Earlier estimation of the models based on pooled firm-year regressions helps maximize the statistical power of our tests. Estimates of Models (9)-(12) suggest that our main findings are robust to alternative estimation procedures. Using the Fama-MacBeth approach, we estimate the cross-sectional regression of yearly firm-level PIN and next take average the estimates of the coefficients and calculate their robust errors. Results strongly corroborate our key findings estimated using pooled regressions. For the WLS approach,[21] its advantage is that it gives each country an equal weight, whereas its disadvantage is that the estimation results can be unduly affected by some small countries with relatively few observations. Consequently, all earnings opacity variables reduce their

[21] The method uses the inverse of the number of observations in each country as the weight.

level of statistical significance, possibly due to the increased weight of emerging countries, whose accounting numbers are generally perceived to be less reliable.

5 Informed Trading and Stock Price Informativeness

While informed trading increases the adverse selection problem, it also improves the informative pricing of stocks. Thus far, little work has been done internationally to test the theoretical implication that informed trading enhances informative pricing. In this section, we first discuss and estimate a popular measure of stock price informativeness. Then we examine whether and to what extent informed trading contributes to stock price informativeness and also whether its role in stock price informativeness differs across emerging and developed countries.

5.1 Correlation of PIN and price informativeness

Following MYY, we employ the firm-specific return variation to measure the extent of informative pricing of a stock.[22] The measure is based on $1 - R^2$, where R^2 is obtained from the following regression,

$$r_{i,j,t} = \alpha_i + \beta_{i,t} r_{m,j,t} + \gamma_{i,t}(r_{US,t} + e_{j,t}) + \epsilon_{i,j,t}. \tag{4}$$

In Equation (4), $r_{i,j,t}$ is the return on firm i's stock in country j at time t, $r_{m,j,t}$ is the return on the market index of country j at time t, $r_{US,t}$ is the return of the U.S. market index at time t, $e_{j,t}$ refers to a change in the exchange rate per U.S. dollar for the currency of country j at time t, and $\epsilon_{i,j,t}$ is a random error. For each year, we estimate (4) using weekly data. Based on the intuition provided by Roll (1988) and MYY, a higher value of $1 - R^2$ indicates that more firm-specific information is being capitalized into the stock price. That is, the stock price becomes more informative. Given the bounded nature of $1 - R^2$, our empirical analysis uses the log transformation of $1 - R^2$ for each firm. Accordingly, price informativeness ψ is measured as follows.

$$\psi_i = log(\frac{1 - R_i^2}{R_i^2}).$$

Table 9 summarizes the descriptive statistics of ψ and also reports the average correlation coefficient between PIN and ψ, by country. Note that Saudi Arabia is excluded from Table 9,

[22] A growing literature has successfully employed this measure to proxy for stock price informativeness. For example, Jin and Myers (2006), Durnev et al. (2003), Ferreira and Laux (2007), among others.

because no weekly return data on its stocks are available. The number of firm-year observations for each country is slightly smaller than that in Table 1, because we require that firms have at least three months of weekly returns for estimating ψ.

Stock prices are most informative in the U.S. ($\psi = 2.597$), followed by the U.K. ($\psi = 2.531$), but are least informative in Turkey ($\psi = 0.445$), followed by China ($\psi = 0.600$). Consistent with the finding of MYY, stock prices are, on average, less synchronous in developed ($\psi = 1.923$) than in emerging markets ($\psi = 1.476$). The average correlation between ψ and PIN is positive for all countries, ranging from 0.075 for Germany to 0.496 for Portugal. Interestingly, the correlation of ψ and PIN is higher in emerging ($\rho = 0.337$) than in developed ($\rho = 0.280$) markets, with the world average correlation coefficient of 0.306. Countries such as Argentina ($\rho = 0.430$), India ($\rho = 0.405$), Mexico ($\rho = 0.407$), Poland ($\rho = 0.465$), Portugal ($\rho = 0.496$), and Thailand ($\rho = 0.413$) show a remarkably high correlation. We test the hypothesis that the correlation coefficients of PIN and ψ are equal in developed and developing countries. Both the $t-$test and Kruskal-Wallis test statistics soundly reject the hypothesis of equal correlation coefficients. The $t-$statistic is 5.28 and the Kruskal-Wallis statistic is 24.0.

Overall, our univariate analysis possibly supports the theoretical prediction that informed trading improves information efficiency. Intriguingly, the association between informed trading and price informativeness varies substantially across countries and is stronger in emerging than in developed markets.

5.2 Analysis of stock price informativeness

In the previous subsection, we have shown that informed trading is positively related to stock price informativeness in every country in our sample. If informed trading is indeed the primary driver of firm-specific return variation, as argued in the literature (e.g., Roll, 1988; and MYY, 2000), the same underlying fundamental factors should explain the cross-country differences of the two information variables, PIN and ψ. To offer insights into this issue, we replicate the regression analysis of Tables 4 and 5, but using price informativeness ψ as the dependent variable. The objective of this analysis is not only to facilitate the comparison of results from these two information variables, but also to gain a deeper understanding of what firm fundamentals, information infrastructures, and country

characteristics can affect cross-country variation in stock price informativeness.

Table 10 reports cross-country regression results of models similar to Models (10)-(13) of Table 4, but substitute the country-year median ψ for PIN. The table shows a strikingly interesting finding. While financial transparency reduces PIN in Table 4, it increases ψ in Table 10. The coefficients of the four financial transparency measures, $FTran$, $AcStd$, $DReq$, and $Disc$ are all positive and mostly statistically significant at conventional levels, compared with their corresponding counterparts in Table 4 whose coefficients are all negative. The results suggest that public information is more readily available in financially transparent countries and that more public disclosure leads to more informative pricing.[23] On the other hand, increasing public disclosure tends to discourage private information gathering and hence decrease informed trading PIN.

Table 11 replicates the firm-level results of Table 5, using ψ as the dependent variable. Comparing the results from these two tables reveals stark differences between ψ and PIN. Specifically, firm-level proxies for financial transparency (i.e., earnings opacity and analyst variables) have negative effects on PIN, but have positive impacts on ψ. For instance, the coefficients of earnings opacity and analyst variables bear opposite signs from their counterparts in Table 5. In fact, the estimates of Model (7) in Table 11 suggest that a one-standard-deviation increase in the firm- and country-level financial transparency proxies combined can produce a 25.5% increase in ψ. It is therefore evident that a more transparent environment, as characterized by low earnings opacity or improved analyst coverage and forecasts, not only helps reduce the degree of information asymmetry, but also allows more firm-specific information to be reflected in the stock price.

The table also highlights a couple of other interesting observations. ψ decreases in $Size$ and $MSCI$ membership, consistent with existing evidence that large firms tend to comove more with the market than do small firms. Furthermore, stock prices are less informative in countries with less stringent rule of law, therefore confirming the finding of MYY. It is worthwhile pointing out that MYY show that stock prices are more informative in countries with better protection of property rights. They use a good government index and the rule of law index [p. 248], separately, to measure the extent to which a country's authorities respect property rights.[24] The two indexes

[23] Jin and Myers (2006) show that stock price synchronicity (i.e., R^2) is higher in less transparent countries.

[24] Their good government index comprises three sub-indexes - government corruption, the risk of expropriation of private property by the government, and the risk of the government repudiating contracts. The index measures how

measure similar quality of a country's institutional features. Our study therefore employs only the rule of law index in the analysis of both ψ and PIN.

5.3 The role of PIN in stock price informativeness

Our analysis has, thus far, suggested that public information plays an important role in informative pricing. This result appears consistent with the notion that stock price impounds firm-specific information about fundamentals through either public information or the trading activity of risk arbitrageurs who have private information. We argue that public information is less available in emerging markets with poor information infrastructures than in developed markets with better information infrastructures. As a result, private informed trading is a more important source of overall information in the emerging than in developed markets. In this section, we test whether both private and public information contribute to informative pricing and also examine their relative contribution to the overall information environment of emerging vs. developed economies.

To perform the tests, we expand Models (3)-(4) and (7)-(8) of Table 11 to incorporate PIN; results of which are reported in Models (1)-(4) of Table 12. We further add the two opacity dummies, EMG and OPA, and their interaction effects, and the results are offered in Models (5)-(12) of the same table. Similar to those of Table 6, these two dummies are employed in place of $GDPC$ and $FTran$.

If informed trading contributes to informative pricing, then we expect PIN to be significantly positive. Similarly, if public information enhances stock price informativeness, it would be likely that the financial transparency measures (both at the country- and firm-levels) also increase in price informativeness ψ, even after controlling for PIN. Furthermore, if less public information is available in emerging and opaque countries than in transparent and developed countries, then the relationship between ψ and PIN should be stronger in the former than latter. We expect the coefficients associated with the interaction effects of $PIN \times EMG$ and $PIN \times OPA$ to be positive. Table 12 reports these estimation results.

The table shows two distinct results. First, the coefficient of PIN is consistently and signifi-

politicians in a country respect the law. The rule of law index measures how well the law is enforced in a country. The correlation between the two indexes is 0.75 in our sample.

cantly positive at the 1% level, with its estimated coefficient ranging from 0.203 in Model (7) to 0.987 in Model (2). This strongly shows the importance of PIN in determining price informativeness. Moreover, adding PIN to the regression models has virtually no qualitative influence on the transparency proxies as well as the untabulated firm and country characteristics. The country-level transparency proxy, $FTran$, and firm-level transparency measures, especially earnings opacity variables, generate economically significant coefficients with predicted signs. The coefficient estimate of $FTran$ varies from 0.368 to 0.380, and for example in Model (4), those of $Accr$, $Corr$, and $Disp$ are -0.013 ($t = -4.07$), 0.090 ($t = 4.07$), and -0.094 ($t = -3.18$), respectively. These estimates suggest that a one-standard-deviation increase in PIN produces a $2.8 - 7.8\%$ rise in ψ. Correspondingly, a one-standard-deviation increase in $FTran$ generates a $13.7 - 14.2\%$ increase in ψ, and the same increase in the combined effects of $Accr$, $Corr$, and $Disp$ produce an average of 8.0% rise in ψ.

Second, the interaction terms, $PIN \times EMG$ and $PIN \times OPA$, are consistently positive across all models. The coefficient estimate of $PIN \times EMG$ varies from 0.570 to 1.306, whereas that of $PIN \times OPA$ is between 0.408 and 0.890. These estimates imply that a one-standard-deviation increase in PIN generates, respectively, additional $4.0 - 9.2\%$ and $2.9 - 6.3\%$ increase in ψ in emerging and opaque countries, compared to those of their counterparts in developed and transparent countries. Also, consistent with our earlier univariate results, the negative EMG and OPA coefficients indicate that stock prices are generally less informative in emerging and opaque countries than in developed and transparent countries.

In summary, the overall evidence is consistent with the argument that both private informed trading and public information disclosure play a significant role in enhancing stock price informativeness. Interestingly, informed trading is significantly more pronounced in emerging (opaque) countries than in developed (transparent) countries.

6 Conclusion

We present the first comprehensive cross-country study to investigate whether and how informed trading varies across different firms and countries around the globe. It further examines whether

informed trading is linked to stock price informativeness and how the link differs across 20 emerging and 22 developed markets during the period 1996 to 2007. We employ the probability of information-based trading (PIN) as a proxy for informed trading and the firm-specific stock return variation as a proxy for stock price informativeness. Results indicate more informed trading in emerging than developed markets, but more stock price informativeness in developed than in emerging markets. The evidence motivates us to investigate what firm fundamentals and country characteristics can possibly explain the cross-country variation in the degrees of informed trading and stock price informativeness.

We find that a host of variables that commonly employed as proxies for country- and firm-level information environments can explain the varying degrees of informed trading and stock price informativeness across emerging and developed markets. Informed trading increases in earnings opacity and analyst forecast dispersion and forecast errors, but decreases in analyst coverage. Similarly, $MSCI$ index membership, stock return volatility, and especially greater financial transparency discourage private information acquisitions and hence reduce informed trading in a country.

Our research provides empirical evidence consistent with the theoretical prediction that informed trading promotes stock price informativeness. PIN is positively and strongly associated with stock price informativeness in every country in our sample. Both public information disclosures and private information-based trading (i.e., PIN) contribute significantly to the varying degrees of price informativeness across international equity markets. Interestingly, the relationship between PIN and stock price informativeness is stronger in emerging than in developed markets, implying that private information is a more significant source of information in emerging economies.

Finally, our findings offer an important implication – increasing financial transparency is an effective approach to mitigating information asymmetry or informed trading. For firms in opaque or emerging markets, promoting greater analyst coverage, as opposed to improving earnings quality, seems to be a more effective mechanism to reduce the degree of information asymmetry or informed trading. The results suggest that accounting information in emerging markets is possibly perceived to be less credible and that different policies might have to be implemented to foster better information environments of emerging and developed markets.

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Appendix A
Stock Exchanges and Automated Trading Start Year by Country

This table lists the main exchange(s) whose stocks are included in this study by country and the year when its (their) automated trading system started. The latter information is obtained from Jain (2005).

Country	Automated Trading Start Year	Stock Exchanges
Argentina	1995	Buenos Aires Stock Exchange
Australia	1987	Australian Stock Exchange
Austria	1996	Vienna Stock Exchange
Belgium	1996	Euronext Brussels
Brazil	1990	Sao Paolo Stock Exchange
Canada	1977	Toronto Stock Exchange
Chile	1989	Santiago Stock Exchange
China	1990	Shanghai Stock Exchange and Shenzhen Stock Exchange
Denmark	1988	Copenhagan Stock Exchange
Finland	1988	Helsinki Stock Exchange
France	1986	Euronext Paris
Germany	1991	Frankfurt Stock Exchange
Greece	1992	Athens Stock Exchange
Hong Kong	1986	Hong Kong Stock Exchange
India	1995	Mumbai Stock Exchange
Indonesia	1995	Jakarta Stock Exchange
Ireland	2000	Irish Stock Exchange
Israel	1997	Tel Aviv Stock Exchange
Italy	1994	Milano Stock Exchange
Japan	1982	Tokyo Stock Exchange and Osaka Securities Exchange
Korea	1988	Korea Stock Exchange
Luxembourg	1991	Luxembourg Stock Exchange
Malaysia	1992	Kuala Lumpur Stock Exchange
Mexico	1996	Bolsa Mexicana de Valores
Netherlands	1994	Euronext Amsterdam
New Zealand	1991	New Zealand Stock Exchange
Norway	1988	Oslo Stock Exchange
Philippines	1993	Philippine Stock Exchange
Poland	1996	Warsaw Stock Exchange
Portugal	1991	Euronext Lisbon
Russia	1994	Russian Trading System
Saudi Arabia	1990	Saudi Stock Exchange
Singapore	1989	Singapore Stock Exchange
South Africa	1996	Johannesburg Stock Exchange
Spain	1989	SIBE-Mercado Continuo Espanol
Sweden	1989	Stockholm Stock Exchange
Switzerland	1996	Swiss Exchange
Taiwan	1985	Taiwan Stock Exchange
Thailand	1991	Thailand Stock Exchange
Turkey	1993	Istanbul Stock Exchange
U.K.	1997	London Stock Exchange
U.S.	2000 (NYSE)	American Stock Exchange and New York Stock Exchange

Appendix B
Variable Acronym, Definition, and Source of Information

VARIABLE	ACRONYM	DESCRIPTION & SOURCE OF INFORMATION
PIN and its Components		
	PIN	Probability of informed trading (TAQTIC)
	α	Probability of an information event (TAQTIC)
	δ	Probability of bad news (TAQTIC)
	μ	Arrival rate of informed traders (TAQTIC)
	ϵ_b	Arrival rate of uninformed buyers (TAQTIC)
	ϵ_s	Arrival rate of uninformed sellers (TAQTIC)
Firm Characteristics		
(i) Basic Characteristics		
Firm size	$Size$	Log of market capitalization denominated in US$ at end of year $t-1$ (Datastream)
Book-to-market	BM	Log of book-to-market equity ratio at June of year $t-1$ (Datastream and Worldscope)
Firm age	Age	Number of years from the listed date to current date (Datastream)
Dividend yield	DY	Average dividend yield during year $t-1$ (Worldscope)
Debt-equity ratio	DE	Ratio of long-term debt to common equity in year $t-1$ (Worldscope)
(ii) Stock Liquidity		
Turnover	$Turn$	Average of monthly trading volume divided by common share outstanding in year $t-1$ (Datastream and Worldscope)
Relative spread	$Sprd$	Daily average of $(Ask - Bid)/(0.5 \cdot (Ask + Bid))$ in year t (TAQTIC)
(iii) Firm Growth		
Sales growth	g_{Sales}	Average of annual net sales growth for years $t-2$ and $t-1$ (Worldscope)
(iv) Firm Performance and Risk		
Stock return	Ret	Average of monthly stock returns over year $t-1$ (Worldscope)
Return on equity	RE	Return on equity ratio in year $t-1$ (Worldscope)
Return volatility	σ_{Ret}	Standard deviation of monthly stock returns over year $t-1$ (Datastream)
Operating income volatility	σ_{Inc}	Standard deviation of annual operating income scaled by lagged total assets over the last 5 years (A minimum of 3 years is required) (Worldscope)
(v) Indexation		
MSCI membership	$MSCI$	MSCI member dummy, which equals one if the firm is included in an MSCI country index (Datastream)
(vi) Earnings Opacity		
Accruals	$Accr$	Magnitude of accruals; $Accr = \lvert ACC/CF \rvert$, where $Acc = (\Delta CA - \Delta CASH) - (\Delta CL - \Delta SD - \Delta TP) - DEPN$, where ΔCA is a change in total current total assets; $\Delta CASH$ is a change in cash and equivalent; ΔCL is a change in total current liability; ΔSD is a change in short-term debt included in current liabilities; ΔTP is a change in income taxes payable; $DEPN$ is depreciation and amortization expenses; when short-term debt and taxes payable are not available for a firm, and then their changes are assumed zero; $CF = Inc - Acc$; CF is operating cash flow and Inc is operating income; All accounting variables are scaled by lagged total assets and measured in year $t-1$; (Worldscope)
Earnings smoothing	$Smth$	Smoothness of accounting reports, and is the ratio of the standard deviation of operating income to standard deviation of CF over the last 5 years (A minimum of 3 years is required) (Worldscope)
Earnings correlation	$Corr$	Correlation coefficient between $\Delta Accr$ and ΔCF over the last 5 years (A minimum of 3 years is required) (Worldscope)
(vii) Analyst Variables		
Analyst coverage	$Alyst$	Number of financial analysts covering a firm in year $t-1$ (I/B/E/S)
Forecast dispersion	$Disp$	Standard deviation of analyst forecasts scaled by mean of analyst forecasts in year $t-1$ (I/B/E/S)
Forecast errors	$FErr$	Absolute value of the difference between announced earnings and mean of estimated earnings scaled by mean of analyst forecasts in year $t-1$ (I/B/E/S)
(vii) Insider Ownership and Institutional Holding and Trading		
Closely-held ownership	$Close$	Fraction of shares closely held by insiders and controlling shareholders in year $t-1$ (Worldscope)
Domestic fund holding	I_{DH}	Fraction of shares held by domestic mutual funds in year $t-1$ (Thomson Reuters)
Foreign fund holding	I_{FH}	Fraction of shares held by foreign mutual funds in year $t-1$ (Thomson Reuters)
Domestic fund trading	I_{DT}	Fraction of shares traded by domestic mutual funds in year t (Thomson Reuters)
Foreign fund trading	I_{FT}	Fraction of shares traded by foreign mutual funds in year t (Thomson Reuters)

Appendix B (*Continued*)
Variable Acronym, Definition, and Source of Information

VARIABLE	ACRONYM	DESCRIPTION & SOURCE OF INFORMATION
Country Characteristics		
(i) Economic & Financial Development		
GDP per capita	$GDPC$	Log of per capita GDP measured in US$ in year $t-1$ (World Development Indicators, WDI)
Stock market cap to GDP	$MCap$	Ratio of stock market capitalization to GDP in year $t-1$ (WDI)
Private credit to GDP	$Credit$	Ratio of private credit to GDP in year $t-1$ (WDI) Private credit refers to financial resources available to the private sector, through loans, purchases of non-equity securities, and trade credits and other accounts receivable
(ii) Economic Growth		
GDP growth	g_{GDP}	Annual GDP growth in year $t-1$ (WDI)
(iii) Economic & Financial Risk		
GDP growth volatility	σ_{GDP}	Standard deviation of annual GDP growth over the last 5 years (WDI)
Stock market volatility	σ_{Mkt}	Annualized standard deviation of daily stock returns over year $t-1$ (WDI)
(iv) Economic & Financial Integration		
FDI to GDP	FDI	Ratio of the sum of absolute values of FDI inflows and outflows with the U.S. to GDP in year $t-1$ (WDI)
Segmentation measure	Seg	Bekaert et al.'s (2007) measure of stock market segmentation, $Seg_{i,t} = \sum_{j=1}^{N} W_{i,j,t} \lvert EY_{i,j,t} - EY_{w,j,t} \rvert$, where $W_{i,j,t}$ denotes industry j's share in country i's portfolio at time t, $EY_{i,j,t}$ is i's local industry earnings yield and $EY_{w,j,t}$ is the corresponding global industry earnings yield (Datastream)
(v) Law Enforcement		
Rule of law	Law	Annual law and order index of year $t-1$ (International Country Risk Guide)
(vi) Financial Disclosure Environment		
Financial transparency factor	$FTran$	It measures the intensity and timeliness of financial disclosures by firms, and interpretation and dissemination of a firm's news by financial analysts and the media (Bushman et al., 2004)
Accounting standards index	$AcStd$	It examines and rates companies' 1990 annual reports on 90 items for 36 countries, covering general information, income statements, balance sheets, fund flow statements, accounting standards, stock data, and other special items. (La Porta et al., 1998)
Disclosure requirements index	$DReq$	The average score of six sub-indexes: prospectus delivering, insider compensations, large shareholder ownership, insider ownership, contracts outside the normal course of business, and related parties transactions. All these sub-indexes are dummy variables, and for each sub-index, the value of 1 is assigned to the index if it signifies high quality disclosure and 0 if otherwise. (La Porta et al., 2006)
Disclosure score index	$Disc$	It is based on survey results about the level and availability of financial disclosure in the annual Global Competitiveness Report issued by the World Economic Forum Average scores for 1999 and 2000 divided by 10 such that the score falls in a $0-1$ range (Gelos and Wei, 2005)
(vii) Corporate Governance Environment		
Governance transparency factor	$GTran$	It provides the extent of governance disclosure on shareholdings and remuneration of firms' insiders and major shareholders (Bushman, el al., 2004)
Anti-self-dealing index	$Antsel$	It focuses on a country's disclosure quality, approval, and litigation governing self-dealing transactions (Djankov et al., 2008)
Other Variables		
Emerging market dummy	EMG	EMG equals 1 if the country is an emerging market, and 0 if otherwise Classification of a country into an emerging or a developed market is according to the International Financial Corporation of World Bank Group
Opacity dummy	OPA	OPA equals 1 if a country's $FTran$ is below the median index, and 0 if otherwise

Appendix C
Cross-Correlation Matrices for Firm- and Country level Variables and PIN

Panel A: Cross-Correlation Matrix of Firm Characteristics and PIN

Var.	PIN	$Size$	BM	Age	DY	DE	$Turn$	$Sprd$	g_{Sales}	Ret	RE	σ_{Ret}	σ_{Inc}	$Accr$	$Smth$	$Corr$	$Alyst$	$Disp$	$FErr$	$Close$	I_{DH}	I_{FH}	I_{DT}
PIN																							
$Size$	-0.22																						
BM	0.11	-0.36																					
Age	-0.10	0.43	0.02																				
DY	0.03	-0.04	0.07	0.02																			
DE	-0.04	0.13	-0.08	0.11	-0.01																		
$Turn$	-0.14	0.18	-0.13	0.03	-0.07	0.00																	
$Sprd$	0.23	-0.28	0.06	-0.12	-0.02	-0.03	-0.02																
g_{Sales}	-0.01	-0.02	-0.12	-0.15	-0.04	-0.03	0.06	0.03															
Ret	-0.05	0.12	-0.28	-0.03	0.00	-0.05	0.11	-0.10	0.16														
RE	-0.03	0.26	-0.18	0.06	0.13	-0.08	-0.03	-0.22	-0.04	0.18													
σ_{Ret}	0.02	-0.30	0.05	-0.26	-0.09	-0.05	0.19	0.23	0.10	0.17	-0.27												
σ_{Inc}	0.01	-0.01	-0.01	-0.01	0.00	-0.01	0.00	0.01	0.02	0.01	0.00	0.01											
$Accr$	0.04	-0.15	0.08	-0.09	-0.03	0.00	0.00	0.06	0.02	-0.02	-0.12	0.10	0.01										
$Smth$	-0.04	0.02	-0.11	-0.04	-0.05	-0.07	0.10	0.07	0.04	0.01	-0.06	0.12	0.01	-0.04									
$Corr$	-0.05	0.03	-0.11	-0.04	-0.05	-0.06	0.12	0.08	0.08	0.02	-0.09	0.13	0.03	-0.03	0.53								
$Alyst$	-0.13	0.69	-0.25	0.22	0.00	0.06	0.15	-0.12	-0.04	-0.02	0.14	-0.13	-0.01	-0.08	0.04	0.06							
$Disp$	0.10	-0.27	0.22	-0.12	-0.07	0.05	-0.01	0.15	-0.01	-0.15	-0.28	0.27	0.01	0.12	0.02	0.03	-0.13						
$FErr$	0.07	-0.23	0.16	-0.06	-0.06	0.06	-0.01	0.11	-0.03	-0.12	-0.31	0.18	0.00	0.12	0.01	0.00	-0.13	0.46					
$Close$	0.18	-0.33	0.17	-0.32	0.07	-0.09	-0.33	0.02	-0.03	-0.03	0.01	0.06	0.00	0.07	-0.08	-0.09	-0.26	0.13	0.07				
I_{DH}	-0.19	0.25	-0.25	0.09	-0.22	0.05	0.40	-0.04	0.02	0.03	0.05	-0.01	-0.01	-0.06	0.12	0.13	0.21	-0.19	-0.13	-0.43			
I_{FH}	-0.01	0.03	-0.01	-0.02	0.01	-0.01	0.00	-0.02	0.01	0.01	0.02	-0.01	0.00	0.00	0.00	-0.01	0.04	0.01	0.00	0.01	-0.01		
I_{DT}	0.01	-0.11	-0.14	-0.15	0.00	-0.05	0.14	0.02	0.09	0.11	0.05	0.06	0.01	0.02	0.05	0.06	-0.09	-0.03	-0.02	-0.12	0.46	0.09	
I_{FT}	-0.04	0.11	-0.16	-0.09	-0.03	-0.02	0.16	-0.03	0.07	0.11	0.06	0.02	0.00	0.01	0.05	0.05	0.14	-0.03	-0.04	-0.17	0.14	0.46	0.26

Panel B: Cross-Correlation Matrix of Country Characteristics and PIN

Variable	PIN	$GDPC$	$MCap$	$Credit$	g_{GDP}	σ_{GDP}	σ_{Mkt}	FDI	Seg	Law	$FTran$	$AcStd$	$DReq$	$Disc$	$GTran$
PIN															
$GDPC$	-0.32														
$MCap$	-0.08	0.24													
$Credit$	-0.30	0.47	0.42												
g_{GDP}	-0.08	-0.19	0.15	-0.16											
σ_{GDP}	0.22	-0.30	-0.01	-0.28	0.22										
σ_{Mkt}	0.07	-0.35	-0.12	-0.26	-0.18	0.30									
FDI	-0.18	0.18	0.12	0.08	0.04	0.01	-0.07								
Seg	0.14	-0.27	-0.21	-0.26	-0.04	0.38	0.36	0.30							
Law	-0.17	0.68	0.08	0.40	-0.10	-0.28	-0.30	0.12	-0.29						
$FTran$	-0.26	0.53	0.19	0.39	-0.26	-0.30	-0.31	-0.12	-0.42	0.37					
$AcStd$	-0.20	0.35	0.38	0.39	0.04	-0.20	-0.14	0.14	-0.22	0.33	0.43				
$DReq$	-0.04	-0.14	0.40	0.38	0.19	0.11	-0.04	0.01	-0.08	0.03	0.13	0.55			
$Disc$	-0.16	0.74	0.22	0.32	-0.16	-0.43	-0.36	0.23	-0.49	0.72	0.61	0.49	-0.20		
$GTran$	0.03	0.30	0.42	0.43	0.13	-0.11	-0.22	0.16	-0.18	0.41	0.05	0.64	0.32	0.51	
$Antsel$	0.18	-0.02	0.37	0.37	0.19	0.13	-0.07	-0.09	-0.13	0.15	-0.05	0.44	0.67	0.11	0.53

Table 1 (Panel A)

Summary Statistics of PIN and its Components

Panel A of this table reports mean, median, standard deviation, minimum, and maximum of the probability of informed trading (PIN), together with the starting year of the sample period for each emerging (EMG) or developed (DEV) country, and the number of firms ($NFirms$). Panel B presents the mean and standard deviation of PIN's components, α, δ, μ, ε_B, and ε_S. All variables are defined in Appendix B. The sample period is 1996 to 2007.

Panel A: Distribution of PIN

				PIN				
Country	*Year*	*DEV/EMG*	*NFirms*	*Mean*	*Median*	*Std*	*Min*	*Max*
Argentina	1996	EMG	82	0.403	0.392	0.185	0.025	0.867
Australia	1996	DEV	1608	0.308	0.290	0.126	0.004	0.964
Austria	1996	DEV	96	0.260	0.248	0.101	0.071	0.545
Belgium	1996	DEV	163	0.346	0.313	0.188	0.026	0.849
Brazil	1996	EMG	91	0.372	0.340	0.176	0.049	0.856
Canada	1996	DEV	1140	0.261	0.247	0.104	0.006	0.807
Chile	1996	EMG	191	0.424	0.421	0.200	0.015	0.975
China	1996	EMG	1322	0.174	0.162	0.085	0.003	0.577
Denmark	1996	DEV	185	0.373	0.325	0.186	0.064	0.899
Finland	1996	DEV	131	0.297	0.284	0.121	0.081	0.656
France	1996	DEV	873	0.312	0.261	0.180	0.005	0.905
Germany	1996	DEV	2658	0.234	0.200	0.160	0.003	0.968
Greece	1996	EMG	295	0.238	0.222	0.079	0.074	0.597
Hong Kong	1996	DEV	954	0.337	0.314	0.131	0.019	0.939
India	1996	EMG	2443	0.297	0.279	0.120	0.003	0.956
Indonesia	1996	EMG	336	0.407	0.389	0.146	0.032	0.947
Ireland	2000	DEV	46	0.263	0.245	0.106	0.092	0.599
Israel	1996	EMG	550	0.335	0.294	0.179	0.025	0.908
Italy	1996	DEV	256	0.224	0.213	0.083	0.044	0.580
Japan	1996	DEV	2650	0.272	0.222	0.169	0.000	0.980
Korea	1996	EMG	721	0.230	0.220	0.079	0.032	0.613
Luxembourg	1998	DEV	21	0.283	0.195	0.252	0.035	0.729
Malaysia	1996	EMG	922	0.311	0.303	0.078	0.063	0.762
Mexico	1996	EMG	161	0.344	0.313	0.184	0.035	0.874
Netherlands	1996	DEV	142	0.254	0.212	0.159	0.031	0.877
New Zealand	1996	DEV	135	0.387	0.372	0.123	0.089	0.741
Norway	1996	DEV	234	0.341	0.307	0.156	0.070	0.852
Philippines	1996	EMG	212	0.368	0.346	0.154	0.026	0.934
Poland	2000	EMG	258	0.274	0.249	0.104	0.078	0.710
Portugal	1996	EMG	72	0.394	0.341	0.210	0.038	0.888
Russia	1996	EMG	112	0.343	0.292	0.199	0.086	0.797
Saudi Arabia	2001	EMG	80	0.238	0.227	0.105	0.039	0.582
Singapore	1996	DEV	592	0.312	0.297	0.095	0.052	0.795
South Africa	1996	EMG	340	0.327	0.311	0.142	0.029	0.865
Spain	1996	DEV	134	0.211	0.196	0.087	0.048	0.630
Sweden	1996	DEV	277	0.249	0.235	0.082	0.083	0.646
Switzerland	1996	DEV	351	0.290	0.260	0.146	0.024	0.856
Taiwan	1996	EMG	723	0.225	0.205	0.107	0.006	0.688
Thailand	1996	EMG	470	0.360	0.309	0.158	0.048	0.929
Turkey	1996	EMG	265	0.212	0.202	0.054	0.085	0.525
U.K.	1996	DEV	2186	0.252	0.230	0.132	0.001	0.908
U.S.	1996	DEV	2564	0.185	0.158	0.108	0.000	0.909
DEV			17,396	0.284	0.256	0.136	0.039	0.802
EMG			9,646	0.314	0.291	0.137	0.039	0.793
World			27,042	0.298	0.272	0.137	0.039	0.797

Table 1 (Panel B)
Summary Statistics of PIN and its Components

Panel B: Distribution of PIN Components

	α		δ		μ		ε_B		ε_S	
Country	*Mean*	*Std*	*Mean*	*Std*	*Mean*	*Std*	*Mean*	*Std*	*Mean*	*Std*
Argentina	0.226	0.125	0.385	0.252	19.609	29.293	7.969	18.487	9.281	20.177
Australia	0.206	0.130	0.408	0.244	28.157	50.637	15.492	51.527	16.897	54.226
Austria	0.265	0.134	0.379	0.207	43.779	44.540	25.172	32.669	25.968	33.633
Belgium	0.275	0.197	0.422	0.260	28.539	60.503	14.256	42.503	14.833	43.273
Brazil	0.186	0.138	0.448	0.271	31.273	41.566	17.542	32.264	18.045	32.865
Canada	0.220	0.119	0.378	0.238	45.942	81.739	30.873	89.520	31.356	83.990
Chile	0.195	0.137	0.416	0.301	6.305	10.663	2.185	5.069	2.337	5.134
China	0.415	0.184	0.334	0.282	212.438	112.786	210.664	138.335	248.428	153.867
Denmark	0.243	0.124	0.381	0.239	28.811	49.785	15.006	34.217	15.476	33.848
Finland	0.236	0.107	0.399	0.202	44.105	89.112	34.735	126.077	36.176	127.790
France	0.278	0.188	0.447	0.251	60.527	145.744	51.260	162.270	59.248	193.758
Germany	0.255	0.219	0.319	0.274	22.090	62.690	15.946	90.161	17.626	93.616
Greece	0.270	0.105	0.370	0.222	91.287	116.730	41.865	58.645	52.553	83.129
Hong Kong	0.195	0.112	0.371	0.260	63.131	82.957	20.397	49.299	25.837	51.629
India	0.207	0.120	0.517	0.285	50.672	74.257	32.252	87.912	32.645	82.683
Indonesia	0.149	0.105	0.296	0.251	51.817	59.978	8.405	17.701	11.231	20.766
Ireland	0.223	0.109	0.388	0.241	17.846	25.840	9.513	14.933	10.537	17.708
Israel	0.268	0.189	0.435	0.268	19.388	31.735	8.943	24.808	9.443	26.411
Italy	0.226	0.112	0.307	0.225	146.457	189.490	96.691	197.682	113.726	220.199
Japan	0.254	0.151	0.411	0.239	57.044	70.006	37.410	66.593	43.155	74.250
Korea	0.317	0.140	0.401	0.252	156.013	141.361	110.138	170.545	126.991	180.021
Luxembourg	0.277	0.317	0.400	0.322	2.105	1.559	0.689	0.691	0.744	0.698
Malaysia	0.200	0.091	0.374	0.238	66.950	64.310	15.214	24.569	21.675	29.362
Mexico	0.202	0.156	0.441	0.273	22.256	32.922	13.083	28.908	13.849	31.073
Netherlands	0.238	0.129	0.346	0.220	98.294	157.976	103.417	231.060	108.620	234.694
New Zealand	0.333	0.154	0.453	0.217	11.056	18.369	3.770	7.269	4.034	7.552
Norway	0.229	0.109	0.404	0.225	31.762	46.095	16.587	35.470	19.457	39.685
Philippines	0.159	0.110	0.362	0.273	22.986	26.181	4.664	7.935	6.473	9.845
Poland	0.254	0.121	0.368	0.259	61.973	76.744	22.071	37.939	31.290	57.652
Portugal	0.202	0.146	0.401	0.258	32.562	47.998	12.265	23.640	16.555	34.968
Russia	0.245	0.144	0.453	0.283	92.884	214.401	106.806	351.717	111.537	344.883
Saudi Arabia	0.265	0.156	0.307	0.292	347.713	284.312	228.868	263.866	316.042	293.445
Singapore	0.184	0.089	0.384	0.241	61.320	69.219	15.454	26.662	19.047	28.115
South Africa	0.234	0.122	0.412	0.227	21.226	35.142	13.201	30.260	13.822	31.683
Spain	0.275	0.120	0.381	0.231	166.660	231.715	126.417	238.532	150.519	270.868
Sweden	0.247	0.105	0.346	0.193	51.895	75.574	31.673	75.033	35.099	77.054
Switzerland	0.204	0.116	0.395	0.237	30.907	51.174	22.968	66.551	23.919	70.927
Taiwan	0.437	0.218	0.413	0.258	73.593	37.563	60.786	49.142	70.467	51.265
Thailand	0.223	0.118	0.347	0.253	65.534	72.985	20.939	36.284	27.395	41.376
Turkey	0.249	0.080	0.208	0.163	161.988	118.914	71.480	72.438	90.353	87.829
U.K.	0.187	0.138	0.379	0.257	39.311	83.060	27.547	94.198	30.690	104.845
U.S.	0.296	0.147	0.352	0.234	135.174	141.136	205.271	287.555	191.654	271.364
DEV	0.243	0.142	0.384	0.239	55.223	83.133	41.843	91.839	45.210	96.987
EMG	0.245	0.135	0.384	0.258	80.423	81.492	50.467	74.023	61.521	80.922
World	0.244	0.139	0.384	0.248	67.223	82.351	45.950	83.356	52.977	89.337

Table 2 (Panel A)
Firm- and Country-level Characteristics by Country

This table reports means of country-year median firm-specific characteristics (Panel A) and country-level characteristics (Panel B). All variables are defined in Appendix B. Average values of DY, $Sprd$, σ_{Inc}, I_{DH}, I_{FH}, I_{DT}, I_{FT}, g_{GDP}, σ_{Mkt}, and Seg are multiplied by 100. The sample period is 1996 to 2007.

Panel A: Firm-Level Characteristics

Country	$Size$	BM	Age	DY	DE	$Turn$	$Sprd$	g_{Sales}	Ret	RE	σ_{Ret}	σ_{Inc}	$Accr$	$Smth$	$Corr$	$Alyst$	$Disp$	$FErr$	$Close$	I_{DH}	I_{FH}	I_{DT}	I_{FT}
Argentina	4.29	-0.13	8.50	0.37	0.25	0.01	3.36	0.05	0.55	0.05	0.13	3.63	0.54	0.61	-0.94	4.42	0.29	0.59	0.64				
Australia	3.03	-0.49	5.67	1.14	0.10	0.03	3.09	0.14	1.40	0.03	0.14	6.67	0.43	0.71	-0.92	3.44	0.07	0.15	0.38	1.40	0.61	2.76	0.79
Austria	6.04	-0.50	6.54	1.85	0.37	0.04	1.00	0.10	1.19	0.11	0.08	2.51	0.58	0.41	-0.98	4.83	0.10	0.26	0.53	1.38	4.48	0.66	2.66
Belgium	4.64	-0.41	6.50	1.93	0.25	0.01	1.66	0.11	1.05	0.10	0.07	2.94	0.61	0.48	-0.96	4.01	0.11	0.31	0.54	2.62	0.44	1.02	0.82
Brazil	5.18	0.09	5.79	3.32	0.29	0.09	6.50	0.10	1.78	0.11	0.15	3.93	0.52	0.55	-0.95	5.56	0.28	0.50	0.73	0.85	0.49	0.42	1.32
Canada	4.10	-0.58	8.25	0.00	0.10	0.03	2.74	0.17	1.41	0.05	0.14	5.86	0.46	0.73	-0.90	3.06	0.13	0.26	0.21	8.46	1.57	4.05	0.95
Chile	4.70	-0.12	12.33	3.32	0.19	0.00	4.23	0.09	0.82	0.10	0.09	2.44	0.45	0.52	-0.96	1.75	0.14	0.28	0.65				
China	5.43	-1.23	4.75	0.30	0.05	0.13	0.23	0.13	0.86	0.06	0.11	2.73	0.75	0.35	-0.99	1.60	0.18	0.27	0.60				
Denmark	4.14	-0.24	13.25	1.64	0.24	0.02	2.14	0.08	1.48	0.11	0.07	3.73	0.53	0.56	-0.93	3.67	0.12	0.22	0.31	1.53	0.44	1.00	1.83
Finland	4.96	-0.59	5.50	3.63	0.36	0.03	1.73	0.10	1.59	0.13	0.09	4.45	0.46	0.66	-0.90	5.15	0.14	0.28	0.37	2.87	4.82	1.88	2.48
France	4.52	-0.66	6.92	1.60	0.26	0.02	2.58	0.09	1.42	0.11	0.10	3.40	0.54	0.54	-0.95	5.63	0.10	0.22	0.59	2.79	0.72	1.59	1.39
Germany	6.16	-0.88	8.08	0.47	0.18	0.06	2.30	0.11	1.10	0.09	0.12	5.45	0.52	0.68	-0.91	10.38	0.09	0.21	0.29	6.64	2.01	1.61	2.21
Greece	4.19	-0.57	6.58	1.74	0.11	0.05	1.21	0.11	1.65	0.08	0.15	3.86	0.72	0.39	-0.98	2.77	0.15	0.36	0.59	2.05	0.20	2.12	0.26
Hong Kong	4.05	0.04	7.08	1.07	0.05	0.03	2.65	0.08	0.89	0.06	0.15	4.14	0.67	0.53	-0.96	4.27	0.12	0.26	0.59	0.00	1.40	0.95	1.76
India	3.31	-0.14	9.83	2.02	0.41	0.01	4.03	0.10	1.25	0.15	0.17	4.05	0.55	0.51	-0.97	2.40	0.12	0.18	0.52	1.92	0.05	1.93	1.62
Indonesia	3.20	-0.08	8.33	0.29	0.11	0.02	5.60	0.13	-2.21	0.06	0.24	5.08	0.70	0.53	-0.96	2.95	0.25	0.51	0.67				
Ireland	5.77	-0.73	15.31	1.55	0.36	0.03	2.34	0.13	1.69	0.15	0.10	2.99	0.42	0.55	-0.94	4.13	0.04	0.12	0.29				
Israel	3.29	-0.38	8.50	1.39	0.55	0.02	7.13	0.08	1.27	0.08	0.12	2.22	0.55	0.50	-0.96	2.38	0.15	0.23	0.63				
Italy	5.64	-0.41	7.75	1.83	0.34	0.04	0.89	0.09	0.93	0.07	0.09	2.71	0.66	0.48	-0.96	5.31	0.16	0.35	0.54	1.26	1.30	1.12	1.02
Japan	5.40	-0.18	13.92	1.20	0.21	0.03	0.94	0.01	0.23	0.04	0.10	1.62	0.54	0.46	-0.96	2.69	0.10	0.28	0.40	1.13	0.78	0.75	0.55
Korea	3.67	0.52	13.08	1.86	0.24	0.18	0.99	0.08	1.20	0.06	0.18	3.08	0.60	0.47	-0.97	1.75	0.22	0.67	0.34				
Luxembourg	5.22	-0.34	10.25	2.37	0.08	0.00	1.56	1.54	0.78	0.11	0.07	2.57	0.55	0.48	-0.95	1.25	0.07	0.07	0.69				
Malaysia	3.59	-0.06	7.00	1.32	0.08	0.02	1.90	0.06	0.20	0.06	0.14	3.49	0.69	0.51	-0.96	2.77	0.15	0.31	0.50	1.10	0.12	0.83	0.38
Mexico	6.00	-0.26	8.33	0.74	0.24	0.01	3.04	0.10	1.16	0.13	0.10	2.96	0.39	0.63	-0.94	6.44	0.17	0.26	0.44	2.38	0.99	0.91	0.77
Netherlands	5.62	-0.77	15.33	2.39	0.30	0.06	0.95	0.08	1.06	0.16	0.09	3.60	0.49	0.53	-0.95	11.69	0.09	0.18	0.38	1.55	8.11	0.97	4.36
New Zealand	4.22	-0.42	6.92	4.32	0.37	0.02	1.88	0.10	1.39	0.11	0.09	3.98	0.39	0.53	-0.96	4.90	0.09	0.13	0.52	0.01	0.90	1.18	1.70
Norway	4.59	-0.47	5.67	1.30	0.50	0.04	2.58	0.14	1.51	0.11	0.10	5.39	0.58	0.64	-0.91	3.54	0.17	0.41	0.42	3.76	0.93	2.81	2.15
Philippines	3.11	0.17	8.83	0.00	0.06	0.01	6.30	0.05	0.63	0.04	0.16	3.46	0.75	0.51	-0.95	5.13	0.16	0.34	0.70				
Poland	3.27	-0.38	5.00	0.00	0.10	0.03	2.39	0.12	2.44	0.10	0.13	4.54	0.76	0.52	-0.97	2.94	0.16	0.37	0.61				
Portugal	3.63	0.01	11.88	1.23	0.48	0.02	3.03	0.07	0.95	0.07	0.09	2.39	0.77	0.37	-0.97	4.08	0.18	0.31	0.61	1.52	0.63	1.28	0.46
Russia	6.46	0.24	5.50	0.79	0.08	0.01	5.38	0.12	4.24	0.08	0.19	5.68	0.45	0.87	-0.76	3.45	0.46	0.45	0.71				
Saudi Arabia	7.14	-0.95	2.93	3.13	0.15	0.04	0.55	0.16	1.99	0.16	0.07	1.24	0.62	0.45	-1.00				0.48				
Singapore	3.93	-0.22	5.50	1.68	0.09	0.03	2.54	0.08	0.67	0.07	0.13	3.45	0.67	0.51	-0.97	2.81	0.13	0.30	0.59	0.02	0.66	0.66	1.26
South Africa	4.18	-0.46	10.04	2.41	0.10	0.02	2.93	0.09	1.66	0.18	0.13	5.19	0.44	0.66	-0.92	3.08	0.06	0.11	0.53	4.97	0.15	2.64	0.73
Spain	6.60	-0.72	11.88	1.99	0.36	0.05	0.52	0.12	1.51	0.14	0.08	2.51	0.51	0.50	-0.95	12.25	0.11	0.22	0.44	3.58	2.92	1.09	1.88
Sweden	4.78	-0.69	5.83	1.93	0.22	0.05	1.36	0.11	1.65	0.11	0.10	5.51	0.45	0.73	-0.88	3.15	0.13	0.28	0.33	7.10	2.22	2.86	2.58
Switzerland	7.86	-0.77	22.67	1.91	0.45	0.05	1.24	0.06	1.41	0.13	0.08	2.39	0.41	0.63	-0.91	13.27	0.07	0.12	0.20	7.55	3.35	1.44	2.59
Taiwan	5.00	-0.30	6.92	1.25	0.12	0.15	0.52	0.08	0.30	0.07	0.13	2.80	0.67	0.49	-0.97	2.08	0.18	0.34	0.22	0.64	0.10	1.94	0.99
Thailand	3.20	0.09	9.67	2.38	0.12	0.07	2.96	0.06	0.95	0.08	0.15	4.24	0.63	0.56	-0.95	2.65	0.22	0.44	0.55	0.44	1.40	0.68	1.88
Turkey	3.79	-0.29	8.33	2.38	0.04	0.13	1.26	0.10	2.27	0.16	0.20	7.23	0.54	0.62	-0.90	3.88	0.25	0.48	0.66				
U.K.	4.47	-0.68	7.42	1.52	0.09	0.04	3.94	0.13	1.27	0.09	0.10	5.09	0.43	0.64	-0.93	2.54	0.07	0.17	0.30	5.28	0.77	5.01	1.60
U.S.	6.67	-0.68	13.71	0.67	0.45	0.08	0.47	0.10	1.38	0.12	0.09	3.62	0.37	0.70	-0.90	6.51	0.03	0.09	0.17	17.77	0.39	5.63	0.92
DEV	5.11	-0.52	9.54	1.73	0.26	0.04	1.87	0.17	1.23	0.10	0.10	3.84	0.51	0.58	-0.93	5.38	0.10	0.22	0.41	3.55	2.43	1.95	1.77
EMG	4.18	-0.17	8.11	1.51	0.19	0.05	3.18	0.09	1.16	0.09	0.15	3.71	0.60	0.53	-0.95	3.27	0.20	0.37	0.57	0.93	1.22	1.42	0.93
World	4.68	-0.36	8.86	1.62	0.23	0.04	2.49	0.13	1.19	0.10	0.12	3.78	0.56	0.55	-0.94	4.40	0.15	0.29	0.49	2.34	1.87	1.79	1.51

Table 2 (Panel B)
Firm- and Country-level Characteristics by Country

	Panel B: Country-Level Characteristics														
Country	$GDPC$	$MCap$	$Credit$	g_{GDP}	σ_{Mkt}	σ_{GDP}	FDI	Seg	Law	$FTran$	$AcStd$	$DReq$	$Disc$	$GTran$	$Antsel$
Argentina	8.95	0.40	0.18	6.20	0.28	3.50	0.04	3.29	0.65	0.22	0.45	0.50	0.70	-0.60	0.34
Australia	9.97	1.02	0.90	0.82	0.17	3.41	0.05	1.26	1.00	0.36	0.75	0.75	0.90	1.08	0.76
Austria	10.09	0.26	1.05	1.00	0.15	2.35	0.04	2.28	1.00	-0.11	0.54	0.25	0.86	-0.08	0.21
Belgium	10.03	0.73	0.77	1.28	0.16	2.27	0.44	1.66	0.85	0.50	0.61	0.42	0.84	-0.07	0.54
Brazil	8.24	0.40	0.34	1.88	0.29	2.61	0.04	3.86	0.38	0.10	0.54	0.25		-0.87	0.27
Canada	10.07	1.08	1.46	1.44	0.16	3.26	0.07	1.89	1.00	1.17	0.74	0.92	0.90	-0.57	0.64
Chile	8.55	0.97	0.75	2.41	0.15	4.17	0.09	2.27	0.83	-0.09	0.52	0.58	0.83	0.21	0.63
China	6.99	0.42	1.11	1.25	0.25	9.37	0.04	2.31	0.78				0.54		0.76
Denmark	10.31	0.61	1.17	1.34	0.17	2.29	0.10	2.05	1.00	0.48	0.62	0.58	0.89	-0.08	0.46
Finland	10.08	1.29	0.62	1.81	0.29	3.96	0.09	2.17	1.00	0.56	0.77	0.50	0.93	0.75	0.46
France	10.02	0.80	0.88	1.05	0.18	2.18	0.08	1.62	0.83	1.27	0.69	0.75	0.84	-0.63	0.38
Germany	10.04	0.49	1.13	1.10	0.18	1.57	0.04	2.01	0.90	1.62	0.62	0.42	0.86	-0.38	0.28
Greece	9.55	0.56	0.49	0.89	0.24	3.97	0.02	2.31	0.58	-0.87	0.55	0.33		-1.02	0.22
Hong Kong	10.18	4.52	1.52	3.55	0.23	4.37	0.34	2.07	0.81	0.66	0.69	0.92	0.83	0.57	0.96
India	6.20	0.47	0.32	1.84	0.25	6.88	0.01	3.25	0.67	-0.64	0.57	0.92	0.69	0.04	0.58
Indonesia	6.77	0.27	0.31	3.96	0.39	3.29	0.02	4.36	0.46			0.50			0.65
Ireland	10.25	0.66	1.38	1.71	0.18	5.85	0.18	1.85	1.00	-0.18		0.67	0.80	1.05	0.79
Israel	9.83	0.67	0.83	2.50	0.21	3.69	0.07	3.75	0.83	0.09	0.64	0.67		-0.40	0.73
Italy	9.85	0.46	0.77	1.11	0.19	1.40	0.02	1.52	0.82	1.16	0.62	0.67		-0.58	0.42
Japan	10.53	0.78	1.99	1.43	0.21	1.32	0.01	2.38	0.89	0.68	0.65	0.75	0.80	0.36	0.50
Korea	9.35	0.57	0.91	3.83	0.36	4.63	0.02	5.20	0.75	-0.49	0.62	0.75	0.67	-0.25	0.47
Luxembourg	10.78	1.55	1.19	2.42	0.18	5.11	6.71	6.13	1.00	-0.51				0.94	0.28
Malaysia	8.29	1.56	1.63	3.87	0.23	4.89	0.06	2.54	0.64	0.23	0.76	0.92	0.73	1.24	0.95
Mexico	8.67	0.28	0.20	3.37	0.23	3.82	0.04	4.34	0.42	0.39	0.60	0.58	0.66	-0.81	0.17
Netherlands	10.08	1.18	1.40	1.09	0.18	2.65	0.17	2.14	1.00	1.34	0.64	0.50	0.87	0.38	0.20
New Zealand	9.55	0.43	1.18	1.74	0.17	2.83	0.05	1.92	1.00	-0.03	0.70	0.67	0.86	1.16	0.95
Norway	10.55	0.49	0.83	1.12	0.21	2.94	0.06	3.34	1.00	0.28	0.74	0.58	0.83	0.55	0.42
Philippines	6.94	0.51	0.41	2.07	0.24	4.42	0.02	2.46	0.46	-0.12	0.65	0.83	0.66	-0.62	0.22
Poland	8.51	0.26	0.29	1.66	0.24	4.00	0.05	2.19	0.67				0.67		0.29
Portugal	9.28	0.43	1.26	1.55	0.15	2.24	0.06	2.36	0.85	-0.26	0.36	0.42	0.73	-0.34	0.44
Russia	7.58	0.46	0.19	4.09	0.35	4.42	0.03	9.25	0.60				0.54		0.44
Saudi Arabia	9.16	0.95	0.54	2.80	0.22	4.04	0.00		0.83						
Singapore	10.05	1.87	1.12	4.00	0.20	5.67	0.23	2.45	0.93	0.46	0.78	1.00	0.84	1.34	1.00
South Africa	8.06	1.88	1.33	1.38	0.24	3.62	0.03	2.84	0.40	-0.41	0.70	0.83	0.79	1.13	0.81
Spain	9.58	0.78	1.12	1.03	0.18	3.70	0.08	1.45	0.79	0.88	0.64	0.50	0.80	0.15	0.37
Sweden	10.22	1.16	1.00	1.70	0.23	3.03	0.13	2.15	1.00	0.80	0.83	0.58	0.90	1.06	0.33
Switzerland	10.43	2.49	1.64	1.09	0.16	1.83	0.14	1.12	0.92	0.81	0.68	0.67	0.81	0.56	0.27
Taiwan	9.56	1.15	1.28	6.14	0.26	2.82	0.03	2.09	0.68		0.65	0.75	0.77		0.56
Thailand	7.70	0.51	1.14	4.07	0.32	3.22	0.04	5.23	0.66	-0.36	0.64	0.92	0.61	-0.82	0.81
Turkey	8.03	0.33	0.25	5.77	0.49	4.59	0.02	3.67	0.68	-0.79	0.51	0.50	0.73	-0.78	0.43
U.K.	10.12	1.53	1.42	0.78	0.16	2.81	0.11	1.20	1.00	0.75	0.78	0.83	0.90	1.03	0.95
U.S.	10.45	1.40	1.77	1.12	0.17	3.21	0.03	0.62	0.93	1.59	0.71	1.00		-0.34	0.65
DEV	10.15	1.16	1.20	1.53	0.19	3.09	0.42	2.06	0.94	0.66	0.69	0.66	0.86	0.37	0.54
EMG	8.31	0.65	0.69	3.08	0.27	4.21	0.03	3.56	0.64	-0.21	0.58	0.64	0.69	-0.28	0.51
World	9.27	0.92	0.95	2.27	0.23	3.62	0.23	2.75	0.80	0.32	0.64	0.65	0.78	0.12	0.53

Table 3
Firm-Level Evidence of Informed Trading

This table reports coefficient estimates of cross-country firm-level regressions of PIN on various combinations of firm-specific characteristics. The latter include $Size$, BM, Age, DY, DE, $Turn$, $Sprd$, g_{Sales}, Ret, RE, σ_{Ret}, σ_{Inc}, $MSCI$, $Accr$, $Smth$, $Corr$, $Alyst$, $Disp$, $FErr$, $Close$, I_{DH}, and I_{FH}, I_{DT}, and I_{FT}. All variables are defined in Appendix B. Coefficients of Age, g_{Sales}, σ_{Inc}, $Accr$, $Smth$, $Corr$, $Alyst$, $Disp$, and $FErr$ are multiplied by 100. NObs is the number of observations; $\bar{R}^2$ is the adjusted R^2. Country and year effects are untabulated. Robust t-statistics are in parentheses. The sample period is 1996 to 2007.

Para.	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14
$Size$	-0.019										-0.010	-0.010	-0.003	-0.003
	(-45.39)										(-16.65)	(-16.57)	(-3.78)	(-3.19)
BM	0.003										0.002	0.002	0.003	0.005
	(3.19)										(2.46)	(2.10)	(2.88)	(2.87)
Age	-0.008										0.003	0.002	-0.005	-0.002
	(-1.03)										(0.35)	(0.21)	(-0.64)	(-0.19)
DY		-0.053									-0.016	-0.017	-0.012	-0.027
		(-2.97)									(-1.34)	(-1.43)	(-1.25)	(-0.51)
DE		-0.004									0.001	0.001	0.000	0.000
		(-5.11)									(1.43)	(1.13)	(0.08)	(0.01)
$Turn$			-0.052								-0.014	-0.013	-0.014	0.044
			(-9.38)								(-3.79)	(-3.65)	(-2.10)	(2.42)
$Sprd$			1.149								0.852	0.854	1.357	2.113
			(19.25)								(13.70)	(13.70)	(15.32)	(14.12)
g_{Sales}				-0.065							-0.010	-0.007	0.128	0.083
				(-1.53)							(-0.20)	(-0.15)	(1.27)	(0.82)
Ret					-0.089						0.089	0.086	0.073	0.160
					(-10.58)						(8.44)	(8.24)	(5.19)	(6.49)
RE					-0.023						0.013	0.012	0.015	0.010
					(-13.66)						(6.68)	(6.33)	(5.17)	(2.01)
σ_{Ret}						0.020					-0.122	-0.119	-0.096	-0.153
						(3.00)					(-15.87)	(-15.57)	(-9.22)	(-9.62)
σ_{Inc}						0.004					0.003	0.004	0.004	0.030
						(4.07)					(1.82)	(2.00)	(1.67)	(11.73)
$MSCI$							-0.067				-0.031	-0.031	-0.020	-0.020
							(-49.76)				(-21.63)	(-21.57)	(-13.31)	(-9.18)
$Accr$								0.219				-0.006	0.023	
								(10.68)				(-0.33)	(0.79)	
$Smth$								-0.282				-0.319	-0.159	
								(-2.49)				(-3.13)	(-1.21)	
$Corr$								-0.448				-0.296	-0.436	
								(-2.99)				(-2.12)	(-2.41)	
$Alyst$									-0.235				-0.042	
									(-22.03)				(-2.76)	
$Disp$									0.930				0.831	
									(4.18)				(3.31)	
$FErr$									0.015				0.025	
									(0.33)				(0.48)	
$Close$										0.055				0.036
										(10.76)				(6.97)
I_{DT}										0.068				0.054
										(4.06)				(3.40)
I_{FT}										-0.038				0.000
										(-1.76)				(0.02)
I_{DH}										-0.005				0.015
										(-0.35)				(0.99)
I_{FH}										-0.095				-0.011
										(-3.33)				(-0.88)
NObs	111,242	111,242	111,242	111,242	111,242	111,242	111,242	100,141	66,317	20,972	100,141	100,141	51,332	18,043
$\bar{R}^2$	22.2%	15.6%	22.3%	15.5%	15.8%	15.5%	20.6%	15.6%	15.2%	9.1%	25.6%	25.6%	17.9%	17.3%
$Year$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$Country$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 4

Country-Level Evidence of Informed Trading

This table reports coefficient estimates of cross-country regressions of country-year median PIN on various combinations of country characteristics. The independent variables are log per capita GDP ($GDPC$), stock market capitalization to GDP ($MCap$), private credit to GDP ($Credit$), GDP growth (g_{GDP}), standard deviation of annual GDP growth (σ_{GDP}), stock market return volatility (σ_{Mkt}), foreign direct investment to GDP (FDI), a measure of stock market segmentation (Seg), law and order index (Law), financial transparency factor ($FTran$), accounting standards index ($AcStd$), disclosure requirements index ($DReq$), disclosure score index ($Disc$), governance transparency factor ($GTran$), and anti-self-dealing index ($Antsel$). All variables are defined in Appendix B. NObs is the number of observations; $\bar{R}^2$ is the adjusted R^2. Year effects are untabulated. Robust t-statistics are in parentheses. The sample period is 1996 to 2007.

Parameter	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13
$GDPC$	-0.017									-0.015	-0.015	-0.025	-0.007
	(-3.28)									(-1.87)	(-1.89)	(-3.51)	(-0.81)
$MCap$	0.009									0.012	0.012	0.013	0.007
	(2.25)									(2.77)	(1.94)	(2.54)	(1.64)
$Credit$	-0.030									-0.053	-0.064	-0.051	-0.067
	(-2.66)									(-4.90)	(-5.21)	(-4.15)	(-5.27)
g_{GDP}		-0.055								-0.942	-0.771	-0.770	-0.841
		(-0.27)								(-5.12)	(-4.05)	(-4.01)	(-4.47)
σ_{GDP}			0.995							0.852	0.374	0.586	0.422
			(3.20)							(2.64)	(1.19)	(1.75)	(1.32)
σ_{Mkt}			-0.081							-0.313	-0.255	-0.268	-0.272
			(-1.18)							(-3.68)	(-2.97)	(-3.05)	(-3.28)
FDI				-0.020						-0.022	-0.003	-0.016	-0.028
				(-6.89)						(-6.43)	(-0.09)	(-0.46)	(-1.01)
Seg				0.877						0.349	0.598	0.571	-0.041
				(2.29)						(0.96)	(1.51)	(1.61)	(-0.09)
Law					-0.073					0.025	0.034	0.035	0.023
					(-3.22)					(0.73)	(1.01)	(1.15)	(0.61)
$FTran$						-0.031				-0.030			
						(-3.22)				(-2.76)			
$AcStd$							-0.259				-0.156		
							(-3.72)				(-2.32)		
$DReq$								-0.096				-0.106	
								(-1.99)				(-2.82)	
$Disc$									-0.161				-0.138
									(-2.45)				(-1.12)
$GTran$						0.006				0.020			
						(0.67)				(2.39)			
$Antsel$							0.096	0.101	0.060		0.107	0.125	0.099
							(3.86)	(2.48)	(2.81)		(3.67)	(3.74)	(3.60)
NObs	426	426	426	409	426	426	408	416	356	409	395	403	346
$\bar{R}^2$	17.9%	5.9%	10.2%	11.0%	9.9%	13.0%	17.7%	11.8%	12.0%	36.2%	34.2%	35.1%	29.4%
$Year$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 5

Effects of Firm- and Country-Level Characteristics on Informed Trading

This table reports coefficient estimates of cross-country firm-level regressions of PIN on various combinations of firm- and country-specific characteristics. The firm-level characteristics are $Size$, BM, Age, DY, DE, $Turn$, $Sprd$, g_{Sales}, Ret, RE, σ_{Ret}, σ_{Inc}, $MSCI$, $Accr$, $Smth$, $Corr$, $Alyst$, $Disp$, and $FErr$. The country-level characteristics are $GDPC$, $MCap$, $Credit$, g_{GDP}, σ_{GDP}, σ_{Mkt}, FDI, Seg, Law, $FTran$, and $GTran$. The acronyms of all variables are defined in Appendix B. Coefficients of Age, g_{Sales}, σ_{Inc}, $Accr$, $Smth$, $Corr$, $Alyst$, $Disp$, and $FErr$ are multiplied by 100. NObs is the number of observations; $\bar{R}^2$ is the adjusted R^2. Country and year effects are untabulated. Robust t-statistics are in parentheses. The sample period is 1996 to 2007.

Parameter	M1	M2	M3	M4	M5	M6	M7	M8
$Size$	-0.013		-0.010	-0.010	-0.007		-0.004	-0.003
	(-19.19)		(-15.06)	(-15.73)	(-8.70)		(-5.15)	(-3.89)
BM	0.008		0.003	0.003	0.008		0.003	0.003
	(8.27)		(2.75)	(2.66)	(7.24)		(3.14)	(3.14)
Age	-0.047		-0.033	0.001	-0.033		-0.029	-0.004
	(-5.91)		(-4.03)	(0.07)	(-3.76)		(-3.36)	(-0.53)
DY	0.024		-0.036	-0.017	0.023		-0.040	-0.018
	(1.55)		(-2.59)	(-1.44)	(1.45)		(-2.54)	(-1.65)
DE	-0.001		0.000	0.001	-0.003		0.000	0.000
	(-1.50)		(0.45)	(1.23)	(-3.35)		(-0.50)	(0.22)
$Turn$	-0.071		-0.059	-0.020	-0.106		-0.071	-0.027
	(-7.84)		(-7.46)	(-4.82)	(-4.43)		(-4.10)	(-3.30)
$Sprd$	0.901		0.915	0.864	1.382		1.383	1.365
	(15.11)		(14.60)	(13.18)	(17.03)		(15.73)	(15.05)
g_{Sales}	-0.052		-0.027	-0.009	-0.018		0.149	0.121
	(-0.87)		(-0.52)	(-0.17)	(-0.18)		(1.51)	(1.19)
Ret	0.148		0.164	0.122	0.135		0.129	0.082
	(12.51)		(14.15)	(11.08)	(8.86)		(8.66)	(5.57)
RE	0.012		0.010	0.012	0.018		0.011	0.014
	(5.80)		(4.97)	(5.90)	(6.07)		(3.80)	(4.87)
σ_{Ret}	-0.171		-0.176	-0.138	-0.138		-0.124	-0.100
	(-17.98)		(-19.04)	(-16.97)	(-8.76)		(-9.41)	(-9.03)
σ_{Inc}	0.004		0.003	0.004	0.005		0.005	0.004
	(1.68)		(1.31)	(1.97)	(1.54)		(1.36)	(1.64)
$MSCI$	-0.021		-0.028	-0.032	-0.007		-0.018	-0.021
	(-12.97)		(-17.98)	(-21.49)	(-3.67)		(-10.40)	(-13.22)
$Accr$	0.013		0.014	-0.005	0.044		0.068	0.033
	(0.59)		(0.61)	(-0.26)	(1.43)		(2.26)	(1.10)
$Smth$	-0.594		-0.374	-0.335	-0.447		-0.158	-0.139
	(-5.01)		(-3.27)	(-3.07)	(-3.09)		(-1.14)	(-1.04)
$Corr$	-0.691		-0.448	-0.334	-0.686		-0.548	-0.516
	(-4.31)		(-2.90)	(-2.29)	(-3.31)		(-2.81)	(-2.82)
$Alyst$					0.006		0.027	-0.036
					(0.33)		(1.70)	(-2.28)
$Disp$					2.006		1.156	0.630
					(7.03)		(4.29)	(2.44)
$FErr$					0.142		0.029	0.028
					(2.57)		(0.53)	(0.53)
$GDPC$		-0.001	0.002			-0.002	0.002	
		(-0.91)	(1.46)			(-1.60)	(1.24)	
$MCap$		0.009	0.005			0.001	0.001	
		(6.95)	(5.58)			(1.51)	(1.32)	
$Credit$		-0.022	-0.005			-0.016	-0.001	
		(-8.02)	(-2.38)			(-7.06)	(-0.62)	
g_{GDP}		-1.097	-0.896			-0.979	-0.797	
		(-27.42)	(-24.60)			(-20.62)	(-17.80)	
σ_{GDP}		0.356	0.483			0.487	0.637	
		(5.98)	(9.67)			(7.03)	(9.94)	
σ_{Mkt}		-0.172	-0.072			-0.174	-0.117	
		(-13.14)	(-6.41)			(-11.83)	(-8.79)	
FDI		0.033	0.021			0.087	0.052	
		(1.60)	(1.49)			(8.02)	(6.38)	
Seg		0.024	-0.113			0.788	0.418	
		(0.33)	(-1.76)			(8.87)	(5.22)	
Law		-0.055	-0.055			0.016	-0.002	
		(-7.29)	(-9.75)			(2.05)	(-0.39)	
$FTran$		-0.035	-0.027			-0.030	-0.032	
		(-17.97)	(-14.96)			(-14.93)	(-15.15)	
$GTran$		0.027	0.011			0.020	0.012	
		(18.09)	(9.09)			(12.25)	(8.97)	
NObs	89,481	89,481	89,481	89,481	48,945	48,945	48,945	48,945
$\bar{R}^2$	18.5%	7.2%	20.8%	25.0%	11.3%	8.8%	15.2%	18.1%
$Year$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$Country$	No	No	No	Yes	No	No	No	Yes

Table 6

Effects of the Interactions of Firm and Country-Level Information Transparency

This table highlights only key coefficient estimates of variables from cross-country firm-level regressions of M1-M4 that correspond to models M3-4 and M7-8 of Table 5, except with an EMG dummy variable and its interactions with $Accr$, $Smth$, $Corr$, $Alyst$, $Disp$, and $FErr$ variables. M5-M8 replicates M1-M4 except EMG is replaced by OPA. Given that EMG and OPA are constructed from GDP and $FTran$ and that the dummies are highly correlated the latter, we exclude GDP and $FTran$ from all model regressions. The dependent variable is PIN, and independent variables are firm- and country-level characteristics, as defined in Appendix B. NObs is the number of observations; $\bar{R}^2$ is the adjusted R^2. Country and year effects are untabulated. Robust t-statistics are in parentheses. The sample period is 1996 to 2007.

	With EMG Dummy Variable				With OPA Dummy Variable			
Parameter	M1	M2	M3	M4	M5	M6	M7	M8
$Accr$	0.031	0.005	0.065	0.033	0.028	0.008	0.060	0.033
	(1.13)	(0.19)	(2.12)	(1.12)	(1.02)	(0.31)	(1.98)	(1.10)
$Smth$	-0.594	-0.389	-0.235	-0.135	-0.618	-0.406	-0.222	-0.136
	(-4.50)	(-3.09)	(-1.68)	(-1.01)	(-4.64)	(-3.19)	(-1.59)	(-1.02)
$Corr$	-0.620	-0.378	-0.616	-0.512	-0.598	-0.318	-0.625	-0.512
	(-3.60)	(-2.32)	(-3.11)	(-2.81)	(-3.42)	(-1.92)	(-3.17)	(-2.81)
$Alyst$			-0.002	-0.028			-0.001	-0.030
			(-0.11)	(-1.76)			(-0.06)	(-1.87)
$Disp$			1.285	0.524			1.228	0.479
			(4.21)	(1.83)			(3.95)	(1.64)
$FErr$			0.064	0.029			0.095	0.050
			(1.00)	(0.46)			(1.45)	(0.78)
EMG	0.006	0.026	0.016	0.044				
	(1.11)	(5.28)	(3.71)	(10.41)				
OPA					0.013	0.022	0.030	0.043
					(2.70)	(4.66)	(7.98)	(10.79)
$Accr \times EMG$	-0.081	-0.038						
	(-1.75)	(-0.89)						
$Accr \times OPA$					-0.076	-0.047		
					(-1.66)	(-1.10)		
$Smth \times EMG$	0.609	0.291						
	(2.36)	(1.25)						
$Smth \times OPA$					0.688	0.364		
					(2.73)	(1.61)		
$Corr \times EMG$	0.683	0.362						
	(1.75)	(1.07)						
$Corr \times OPA$					0.490	-0.051		
					(1.33)	(-0.16)		
$Alyst \times EMG$			-0.074	-0.118				
			(-1.83)	(-3.25)				
$Alyst \times OPA$							-0.071	-0.095
							(-2.14)	(-3.18)
$Disp \times EMG$			0.309	0.587				
			(0.47)	(0.99)				
$Disp \times OPA$							0.291	0.716
							(0.49)	(1.32)
$FErr \times EMG$			-0.164	-0.015				
			(-1.45)	(-0.15)				
$FErr \times OPA$							-0.266	-0.099
							(-2.37)	(-0.99)
NObs	89,481	89,481	48,945	48,945	89,481	89,481	48,945	48,945
$\bar{R}^2$	20.3%	25.0%	14.5%	18.1%	20.4%	25.0%	14.7%	18.1%
$Year$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$Country$	No	Yes	No	Yes	No	Yes	No	Yes
Firm char.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country char.	Yes	No	Yes	No	Yes	No	Yes	No

Table 7
Firm- and Country-Level Regressions using Components of PIN

This table reports coefficient estimates of two cross-country firm-level regressions for each PIN component similar to M2 and M7 of Table 5. The five dependent variables are the probability of an information event (α), probability of bad news (δ), arrival rate of bad news (μ), arrival rate of buyers (ϵ_b), and arrival rate of sellers (ϵ_s). The log of μ, ϵ_b and ϵ_s are employed in the regressions. All firm- and country-specific characteristics are defined in Appendix B. Coefficients of Age, g_{Sales}, σ_{Inc}, $Accr$, $Smth$, $Corr$, $Alyst$, $Disp$, and $FErr$ are multiplied by 100. NObs is the number of observations; $\bar{R}^2$ is the adjusted R^2. Country and year effects are untabulated. Robust t-statistics are in parentheses. The sample period is 1996 to 2007.

	α		δ		μ		ε_B		ε_S	
Parameter	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10
$Size$	0.012	0.005	0.002	0.005	0.137	0.045	0.240	0.081	0.259	0.098
	(19.08)	(6.04)	(2.83)	(4.12)	(17.26)	(4.46)	(18.69)	(5.33)	(19.75)	(5.94)
BM	0.004	0.006	0.011	0.011	-0.023	-0.013	-0.023	-0.024	-0.013	-0.002
	(4.87)	(4.40)	(7.83)	(5.66)	(-2.15)	(-0.95)	(-1.43)	(-1.23)	(-0.77)	(-0.07)
Age	-0.110	-0.080	-0.026	-0.021	-0.761	-0.867	-1.350	-1.305	-1.480	-1.505
	(-13.46)	(-8.40)	(-2.23)	(-1.46)	(-8.10)	(-8.10)	(-9.47)	(-8.24)	(-9.61)	(-8.52)
DY	0.088	0.076	0.042	0.005	-0.560	0.610	-0.061	1.083	0.460	1.640
	(2.59)	(2.09)	(1.54)	(0.23)	(-2.09)	(3.18)	(-0.29)	(2.96)	(2.09)	(2.75)
DE	0.003	0.001	0.005	0.005	0.041	0.019	0.045	0.030	0.060	0.037
	(3.50)	(1.10)	(4.12)	(3.17)	(4.58)	(1.81)	(3.34)	(1.98)	(4.03)	(2.10)
$Turn$	-0.016	-0.043	-0.087	-0.087	1.208	0.251	1.547	0.573	1.271	0.072
	(-3.01)	(-3.33)	(-6.86)	(-4.73)	(8.08)	(2.22)	(8.45)	(3.37)	(7.97)	(0.52)
$Sprd$	-0.788	-2.008	0.580	1.183	-14.875	-27.081	-25.102	-43.766	-25.188	-45.322
	(-14.07)	(-26.94)	(12.25)	(16.27)	(-16.39)	(-28.16)	(-16.71)	(-29.92)	(-16.51)	(-28.73)
g_{Sales}	-0.079	0.014	-0.717	-0.995	1.782	3.781	1.452	1.136	2.292	4.003
	(-1.67)	(0.10)	(-5.78)	(-3.99)	(3.38)	(3.18)	(2.42)	(0.77)	(3.28)	(2.08)
Ret	0.017	0.009	0.156	0.128	-1.977	-0.918	-3.211	-2.172	-2.339	-0.963
	(1.49)	(0.58)	(7.30)	(4.34)	(-17.39)	(-6.09)	(-19.47)	(-10.15)	(-13.43)	(-3.93)
RE	-0.001	-0.005	0.003	-0.002	-0.167	-0.137	-0.234	-0.220	-0.178	-0.139
	(-0.67)	(-1.45)	(0.79)	(-0.31)	(-7.09)	(-4.08)	(-7.18)	(-4.88)	(-4.86)	(-2.54)
σ_{Ret}	-0.061	0.005	-0.231	-0.213	2.759	2.440	4.005	3.491	3.421	3.453
	(-7.11)	(0.38)	(-16.19)	(-9.86)	(26.85)	(19.33)	(27.41)	(19.88)	(23.05)	(17.97)
σ_{Inc}	0.000	0.000	0.003	0.002	-0.009	-0.009	-0.002	-0.008	-0.004	-0.001
	(-0.59)	(-0.09)	(8.08)	(3.18)	(-1.03)	(-4.27)	(-0.29)	(-1.51)	(-0.45)	(-0.21)
$MSCI$	-0.003	-0.004	-0.009	-0.006	0.236	0.138	0.396	0.245	0.310	0.150
	(-1.58)	(-2.14)	(-3.53)	(-1.88)	(11.99)	(6.41)	(14.47)	(8.49)	(10.13)	(4.36)
$Accr$	0.013	-0.035	-0.078	-0.049	1.779	1.193	1.885	0.950	2.057	1.464
	(0.54)	(-0.96)	(-1.81)	(-0.72)	(7.73)	(3.37)	(6.14)	(2.07)	(5.92)	(2.61)
$Smth$	-0.038	-0.264	-0.544	-0.170	1.950	-1.304	4.541	-0.781	3.503	-1.410
	(-0.34)	(-1.75)	(-2.77)	(-0.65)	(1.65)	(-0.86)	(2.72)	(-0.37)	(1.88)	(-0.56)
$Corr$	-0.474	-0.170	-0.367	-0.362	-9.644	-9.941	-6.213	-4.602	-9.208	-9.144
	(-2.97)	(-0.79)	(-1.33)	(-0.99)	(-5.45)	(-4.62)	(-2.54)	(-1.53)	(-3.33)	(-2.55)
$Alyst$		0.123		0.024		2.030		1.980		2.923
		(7.13)		(0.92)		(10.46)		(6.92)		(9.25)
$Disp$		1.355		-2.623		41.642		36.445		43.103
		(4.21)		(-5.11)		(13.28)		(8.73)		(8.67)
$FErr$		-0.025		0.045		2.244		1.903		1.631
		(-0.38)		(0.41)		(3.11)		(2.02)		(1.53)
$GDPC$	0.005	-0.003	-0.014	-0.029	-0.057	-0.038	-0.079	-0.090	-0.033	-0.085
	(4.18)	(-1.59)	(-6.27)	(-9.95)	(-4.44)	(-1.94)	(-4.40)	(-3.57)	(-1.71)	(-2.94)
$MCap$	0.003	0.010	-0.005	-0.003	0.110	0.158	0.090	0.177	0.132	0.285
	(5.59)	(9.57)	(-4.98)	(-1.79)	(16.19)	(11.51)	(8.66)	(9.70)	(11.35)	(13.37)
$Credit$	0.053	0.051	0.017	0.013	0.802	0.896	1.015	1.056	1.267	1.419
	(25.24)	(19.65)	(6.36)	(3.83)	(28.90)	(28.23)	(24.96)	(24.34)	(28.54)	(28.00)
σ_{GDP}	-0.411	-0.489	-0.636	-0.709	5.924	2.780	2.383	-0.905	-1.860	-7.505
	(-8.58)	(-6.34)	(-7.37)	(-5.77)	(11.70)	(3.60)	(3.20)	(-0.89)	(-2.45)	(-6.34)
σ_{Mkt}	0.206	0.132	0.037	-0.055	1.275	1.815	2.485	2.879	2.863	3.367
	(16.45)	(8.24)	(1.91)	(-2.36)	(10.71)	(11.11)	(14.63)	(13.16)	(15.84)	(13.86)
g_{GDP}	0.789	0.687	-0.003	-0.242	14.184	12.065	22.519	19.379	25.681	22.464
	(21.85)	(13.22)	(-0.05)	(-3.10)	(29.56)	(19.86)	(32.77)	(22.47)	(34.57)	(23.13)
FDI	-0.018	-0.037	-0.001	0.063	-0.327	-0.244	-0.536	-0.625	-0.564	-0.784
	(-4.34)	(-3.44)	(-0.09)	(4.66)	(-7.79)	(-2.14)	(-5.71)	(-4.29)	(-4.79)	(-4.78)
Seg	-2.138	-2.964	1.230	0.887	-21.354	-39.654	-27.376	-52.929	-38.931	-68.747
	(-28.93)	(-25.33)	(11.06)	(5.84)	(-23.49)	(-28.06)	(-21.69)	(-27.15)	(-27.77)	(-30.10)
Law	0.076	0.106	0.025	0.024	1.152	0.853	1.792	1.219	2.044	1.659
	(13.06)	(12.11)	(2.75)	(1.99)	(16.57)	(8.65)	(18.55)	(9.33)	(19.97)	(11.27)
$FTran$	-0.074	-0.081	0.002	-0.006	-0.922	-1.015	-0.928	-0.991	-1.384	-1.534
	(-36.18)	(-28.20)	(0.72)	(-1.88)	(-38.73)	(-30.95)	(-26.78)	(-22.42)	(-35.19)	(-28.45)
$GTran$	-0.030	-0.028	0.004	0.013	-0.415	-0.494	-0.585	-0.664	-0.726	-0.840
	(-22.26)	(-15.11)	(2.19)	(4.97)	(-24.69)	(-22.16)	(-24.40)	(-23.01)	(-27.76)	(-24.92)
NObs	97,497	54,946	97,311	55,038	97,396	54,803	97,484	54,846	97,237	54,641
$\bar{R}^2$	19.7%	29.0%	2.9%	3.5%	41.1%	45.7%	41.0%	42.5%	39.6%	43.4%
$Year$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$Country$	No	No	No	No	No	No	No	No	No	No

Table 8
Robustness Tests

This table shows results of various robustness tests and reports coefficient estimates of only main cross-country firm-level regressions similar to M3 and M7 of Table 5. Below M1-M2 contain results using the U.S. sample, M3-M4 show those using non-U.S. sample, M5-M8 report results of 2 sub-sample periods (1996-2001 and 2002-2006), M9-M10 replicate the results of M3 and M7 of table 5 using the Fama-Macbeth approach, and finally M11-M12 use the weighted least square approach (WLS). The dependent variable is PIN, and the independent variables are firm- and country-level characteristics as defined in Appendix B. Coefficients of Age, g_{Sales}, σ_{Inc}, $Accr$, $Smth$, $Corr$, $Alyst$, $Disp$, and $FErr$ are multiplied by 100. NObs is the number of observations; $\bar{R}^2$ is the adjusted R^2. Country and year effects are untabulated. Robust t-statistics are in parentheses. The sample period is 1996 to 2007.

	U.S. Only		Non-US Markets		1996-2001		2002-2006		Fama-Macbeth Method		WLS Method	
Parameter	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
$Size$	-0.019	-0.008	-0.008	-0.003	-0.007	-0.001	-0.011	-0.006	-0.009	-0.003	-0.013	-0.008
	(-18.29)	(-5.80)	(-11.24)	(-2.82)	(-7.23)	(-1.01)	(-16.01)	(-7.24)	(-20.25)	(-5.30)	(-10.99)	(-5.15)
BM	0.001	-0.001	0.004	0.004	0.003	0.004	0.003	0.004	0.002	0.003	0.000	0.001
	(0.33)	(-0.49)	(3.59)	(2.95)	(2.14)	(2.33)	(2.72)	(2.91)	(4.89)	(13.50)	(-0.07)	(0.44)
Age	0.002	-0.026	-0.028	-0.023	-0.139	-0.098	0.026	0.023	-0.063	-0.038	0.046	-0.020
	(0.22)	(-3.01)	(-2.89)	(-2.19)	(-10.44)	(-7.08)	(3.02)	(2.52)	(-4.34)	(-3.91)	(2.80)	(-1.26)
DY	-0.331	-0.204	-0.015	-0.021	-0.036	-0.037	0.031	-0.088	-0.008	-0.083	-0.011	-0.009
	(-5.52)	(-4.05)	(-1.28)	(-2.00)	(-2.53)	(-2.57)	(0.99)	(-2.50)	(-0.85)	(-16.27)	(-1.11)	(-0.88)
DE	-0.001	-0.002	0.002	0.001	0.001	0.001	0.000	-0.001	0.001	0.000	-0.001	-0.001
	(-1.54)	(-2.30)	(2.07)	(0.57)	(0.87)	(0.86)	(-0.34)	(-1.18)	(2.84)	(0.59)	(-0.28)	(-0.38)
$Turn$	-0.118	-0.038	-0.044	-0.060	-0.046	-0.024	-0.051	-0.099	-0.041	-0.061	-0.018	-0.014
	(-8.07)	(-2.42)	(-6.53)	(-3.64)	(-2.79)	(-2.10)	(-6.96)	(-10.70)	(-10.78)	(-8.55)	(-2.08)	(-1.94)
$Sprd$	0.956	2.984	0.913	1.281	0.720	1.431	0.993	1.343	1.141	1.668	1.244	2.131
	(5.49)	(7.25)	(14.24)	(14.36)	(7.20)	(10.32)	(15.43)	(13.20)	(19.04)	(18.44)	(16.77)	(12.82)
g_{Sales}	1.836	2.023	-0.026	0.039	-0.677	-0.165	0.041	0.264	-0.292	0.060	-0.172	-0.305
	(6.30)	(5.48)	(-0.49)	(0.38)	(-3.01)	(-0.57)	(0.82)	(2.61)	(-6.63)	(1.84)	(-1.48)	(-1.93)
Ret	0.147	0.123	0.159	0.105	0.118	0.065	0.191	0.156	0.215	0.130	0.244	0.202
	(6.02)	(4.34)	(12.30)	(5.99)	(5.90)	(2.71)	(13.42)	(8.22)	(26.93)	(31.43)	(7.89)	(6.28)
RE	0.000	-0.004	0.013	0.016	0.004	0.006	0.014	0.015	0.013	0.013	0.021	0.018
	(-0.04)	(-0.69)	(5.93)	(5.01)	(0.87)	(1.16)	(6.21)	(4.23)	(10.90)	(12.17)	(3.73)	(2.73)
σ_{Ret}	-0.034	-0.026	-0.200	-0.154	-0.154	-0.109	-0.186	-0.118	-0.188	-0.098	-0.234	-0.212
	(-1.87)	(-1.30)	(-20.31)	(-10.78)	(-10.10)	(-6.19)	(-17.54)	(-8.20)	(-35.76)	(-13.19)	(-10.44)	(-6.50)
σ_{Inc}	-0.014	-0.011	0.003	0.004	-0.829	-1.706	0.004	0.004	-0.880	-0.548	0.003	0.006
	(-1.21)	(-0.42)	(1.17)	(1.38)	(-1.89)	(-3.26)	(1.25)	(1.29)	(-4.49)	(-5.84)	(1.41)	(1.97)
$MSCI$	-0.006	-0.004	-0.033	-0.023	-0.030	-0.016	-0.028	-0.019	-0.028	-0.016	-0.036	-0.019
	(-2.45)	(-1.71)	(-18.96)	(-11.47)	(-11.95)	(-6.12)	(-17.32)	(-10.45)	(-65.99)	(-26.46)	(-9.71)	(-5.40)
$Accr$	0.215	0.238	-0.015	0.019	0.069	0.087	-0.018	0.020	0.008	0.054	0.009	0.046
	(2.90)	(2.28)	(-0.67)	(0.63)	(1.39)	(1.60)	(-0.77)	(0.57)	(1.34)	(7.30)	(0.14)	(0.48)
$Smth$	0.022	-0.200	-0.302	-0.072	-0.136	-0.206	-0.344	0.001	-0.203	-0.047	-0.434	-0.384
	(0.12)	(-1.08)	(-2.39)	(-0.44)	(-0.63)	(-0.89)	(-2.73)	(0.01)	(-5.45)	(-1.63)	(-1.95)	(-1.62)
$Corr$	-0.083	-0.108	-0.469	-0.559	-0.393	-0.282	-0.408	-0.535	-0.135	-0.239	0.373	0.627
	(-0.32)	(-0.41)	(-2.72)	(-2.42)	(-1.20)	(-0.80)	(-2.46)	(-2.47)	(-2.36)	(-6.24)	(1.04)	(1.51)
$Alyst$		-0.078		0.029		-0.026		0.074		0.006		-0.050
		(-3.50)		(1.59)		(-1.17)		(4.00)		(0.57)		(-2.05)
$Disp$		3.390		0.929		0.342		1.109		0.353		0.343
		(3.97)		(3.32)		(0.73)		(3.62)		(2.90)		(0.46)
$FErr$		-0.434		0.062		-0.055		0.031		-0.009		0.226
		(-1.85)		(1.13)		(-0.67)		(0.44)		(-0.41)		(1.10)
$GDPC$			0.000	0.001	0.006	0.007	0.001	-0.003	-0.002	-0.005	-0.004	-0.006
			(0.34)	(0.49)	(3.37)	(3.46)	(0.82)	(-1.83)	(-1.42)	(-4.50)	(-2.14)	(-2.82)
$MCap$			0.005	0.003	-0.023	-0.030	0.008	0.001	-0.021	-0.026	0.003	0.001
			(7.30)	(3.32)	(-8.61)	(-10.04)	(9.36)	(1.33)	(-3.23)	(-3.75)	(2.45)	(1.07)
$Credit$			0.004	0.008	0.010	0.002	-0.025	-0.008	-0.007	-0.006	-0.013	-0.009
			(1.99)	(3.77)	(3.24)	(0.48)	(-9.77)	(-3.24)	(-2.14)	(-2.27)	(-3.04)	(-2.23)
g_{GDP}			-0.549	-0.448	-0.674	-0.598	-0.936	-0.979	-1.454	-1.366	-0.722	-0.642
			(-15.29)	(-10.11)	(-13.30)	(-9.98)	(-18.34)	(-15.26)	(-38.96)	(-27.90)	(-10.65)	(-10.40)
σ_{GDP}			0.481	0.689	0.771	1.035	0.376	0.498	1.386	1.282	0.630	0.697
			(9.54)	(10.62)	(8.85)	(9.09)	(7.10)	(7.72)	(19.91)	(14.44)	(6.51)	(6.21)
σ_{Mkt}			-0.062	-0.093	-0.060	-0.099	-0.100	-0.139	-0.188	-0.181	-0.138	-0.133
			(-5.46)	(-6.78)	(-3.57)	(-4.89)	(-7.08)	(-9.31)	(-13.67)	(-19.11)	(-7.66)	(-6.26)
FDI			0.011	0.022	0.073	0.043	0.013	0.147	0.126	0.207	-0.016	0.002
			(1.16)	(3.07)	(6.58)	(4.64)	(0.97)	(9.24)	(3.87)	(5.61)	(-4.45)	(0.28)
Seg			-0.513	-0.179	0.379	0.434	-0.558	-0.002	0.042	-0.024	0.173	-0.055
			(-7.86)	(-2.03)	(2.87)	(3.20)	(-8.16)	(-0.02)	(0.40)	(-0.22)	(1.07)	(-0.40)
Law			-0.053	-0.008	-0.015	-0.014	-0.063	-0.007	-0.049	-0.025	0.007	0.007
			(-9.03)	(-1.13)	(-1.42)	(-1.19)	(-9.56)	(-1.01)	(-5.47)	(-2.25)	(0.80)	(0.63)
$FTran$			-0.020	-0.024	-0.018	-0.017	-0.026	-0.033	-0.019	-0.018	-0.014	-0.014
			(-10.79)	(-11.05)	(-5.23)	(-4.53)	(-13.47)	(-14.86)	(-10.32)	(-6.01)	(-4.75)	(-4.69)
$GTran$			0.003	0.004	0.012	0.018	0.012	0.014	0.012	0.018	0.006	0.014
			(2.62)	(2.86)	(5.42)	(7.24)	(9.34)	(9.73)	(35.69)	(23.72)	(2.40)	(5.64)
NObs	12,099	9,454	77,382	39,491	28,681	18,976	60,800	29,969			89,481	48,945
$\bar{R}^2$	34.3%	22.6%	16.9%	9.9%	17.1%	14.1%	24.3%	16.2%			28.1%	26.4%
$Year$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$Country$	Yes	Yes	No	No	No	No	No	No	No	No	No	No

Table 9

Stock Price Informativeness and its Correlation with PIN Around the World

This table reports mean, median, standard deviation, minimum, and maximum of price informativeness, ψ, together with the number of firms ($NFirms$) and the correlation of ψ with PIN by country. The variables are defined in Appendix B. $\psi_i = log(\frac{1-R_i^2}{R_i^2})$, and R_i^2 is obtained from the regression, $r_{i,j,t} = \alpha_i + \beta_{i,t} r_{m,j,t} + \gamma_{i,t}(r_{US,t} + e_{j,t}) + \epsilon_{i,j,t}$. $r_{i,j,t}$ is the weekly return on firm i's stock in country j at time t, $r_{m,j,t}$ is the weekly return on the market index of country j at time t, $r_{US,t}$ is the weekly return of the U.S. market index at time t, $e_{j,t}$ refers to a weekly change in the exchange rate per U.S. dollar for the currency of country j at time t, and $\epsilon_{i,j,t}$ is a random error. The sample period is 1996 to 2007.

Country	$NFirms$	$Mean$	$Median$	Std	Min	Max	$\rho(\psi, PIN)$
Argentina	81	1.515	1.301	1.493	-1.218	5.326	0.430
Australia	1600	2.136	2.071	1.359	-1.183	6.246	0.322
Austria	93	1.393	1.254	1.083	-0.439	4.500	0.217
Belgium	161	1.946	1.805	1.253	-0.559	5.720	0.224
Brazil	91	1.426	1.381	1.432	-0.930	5.082	0.378
Canada	1137	2.312	2.250	1.362	-0.696	6.523	0.243
Chile	190	1.851	1.665	1.356	-0.652	6.095	0.246
China	1322	0.600	0.498	0.818	-1.412	4.059	0.127
Denmark	183	2.198	2.036	1.197	-0.195	6.074	0.340
Finland	130	2.338	2.213	1.205	-0.383	5.573	0.374
France	873	2.354	2.260	1.343	-0.484	6.294	0.308
Germany	2637	1.985	1.772	1.496	-0.941	7.787	0.075
Greece	294	1.102	0.956	0.981	-0.905	4.274	0.399
Hong Kong	954	2.425	2.292	1.402	-0.763	6.664	0.370
India	1461	1.907	1.771	1.143	-0.367	6.054	0.405
Indonesia	336	1.412	1.320	1.242	-1.189	5.265	0.295
Ireland	46	2.218	2.078	1.437	-0.369	5.936	0.305
Israel	550	2.044	1.975	1.422	-0.641	6.273	0.400
Italy	256	1.404	1.315	1.098	-1.020	4.838	0.379
Japan	2650	1.261	1.118	0.990	-0.897	4.887	0.222
Korea	717	1.302	1.179	0.963	-0.741	4.842	0.221
Luxembourg	21	1.957	1.865	1.387	-0.369	4.421	0.218
Malaysia	922	1.104	0.951	0.981	-1.048	4.824	0.218
Mexico	159	1.232	1.004	1.407	-1.315	5.427	0.407
Netherlands	141	1.843	1.661	1.316	-0.902	5.920	0.329
New Zealand	134	1.409	1.276	1.172	-1.000	4.911	0.154
Norway	234	1.917	1.816	1.179	-0.465	5.545	0.402
Philippines	211	2.096	2.010	1.463	-0.896	6.407	0.311
Poland	257	1.427	1.331	1.107	-0.931	4.888	0.465
Portugal	70	1.863	1.654	1.357	-0.562	5.340	0.496
Russia	102	2.245	2.260	1.833	-1.172	6.506	0.357
Singapore	592	1.553	1.418	1.131	-0.749	5.553	0.319
South Africa	339	1.628	1.465	1.351	-0.810	5.829	0.335
Spain	132	1.403	1.315	1.111	-1.110	4.765	0.312
Sweden	277	1.609	1.485	1.151	-0.984	5.258	0.388
Switzerland	349	1.520	1.438	1.254	-1.170	5.579	0.197
Taiwan	722	1.063	0.951	0.943	-0.942	4.345	0.139
Thailand	470	1.778	1.647	1.361	-1.010	5.792	0.413
Turkey	263	0.445	0.339	1.037	-1.644	4.157	0.355
U.K.	2181	2.531	2.445	1.315	-0.806	6.572	0.119
U.S.	2547	2.597	2.171	1.903	-0.732	10.141	0.343
DEV	17,328	1.923	1.789	1.279	-0.737	5.896	0.280
EMG	8,557	1.476	1.350	1.247	-0.968	5.305	0.337
World	25,885	1.716	1.586	1.264	-0.844	5.622	0.306

Table 10
Country-level Analysis of Stock Price Informativeness

This table reports coefficient estimates of cross-country regressions of country-year median price informativeness ψ on various combinations of country characteristics. ψ is defined in Table 9. The independent variables are log per capita GDP ($GDPC$), stock market capitalization to GDP ($MCap$), private credit to GDP ($Credit$), GDP growth (g_{GDP}), standard deviation of annual GDP growth (σ_{GDP}), stock market return volatility (σ_{Mkt}), foreign direct investment to GDP (FDI), a measure of stock market segmentation (Seg), law and order index (Law), financial transparency factor ($FTran$), accounting standards index ($AcStd$), disclosure requirements index ($DReq$), disclosure score index ($Disc$), governance transparency factor ($GTran$), anti-self-dealing index ($Antsel$). All variables are defined in Appendix B. NObs is the number of observations; $\bar{R}^2$ is the adjusted R^2. Year effects are untabulated. Robust t-statistics are in parentheses. The sample period is 1996 to 2007.

Parameter	M1	M2	M3	M4
$GDPC$	-0.171	-0.102	-0.001	-0.045
	(-2.97)	(-1.85)	(-0.01)	(-0.73)
$MCap$	0.219	0.191	0.150	0.200
	(5.32)	(4.50)	(3.37)	(5.22)
$Credit$	-0.278	-0.392	-0.490	-0.484
	(-2.78)	(-3.75)	(-4.81)	(-4.73)
g_{GDP}	0.579	-2.828	-2.039	-0.948
	(0.43)	(-2.11)	(-1.58)	(-0.71)
σ_{GDP}	-4.849	-4.500	-6.427	-8.807
	(-1.71)	(-1.32)	(-2.14)	(-2.82)
σ_{Mkt}	-2.789	-3.162	-2.971	-2.861
	(-4.09)	(-4.77)	(-4.59)	(-4.16)
FDI	-0.024	-0.298	-0.103	-0.314
	(-0.89)	(-1.53)	(-0.46)	(-1.77)
Seg	7.042	5.275	5.855	7.688
	(2.42)	(1.69)	(1.93)	(2.57)
Law	1.066	0.756	0.749	0.591
	(3.04)	(2.22)	(2.19)	(1.54)
$FTran$	0.224			
	(2.47)			
$AcStd$		1.113		
		(2.27)		
$DReq$			0.976	
			(2.88)	
$Disc$				0.531
				(0.68)
$GTran$	-0.043			
	(-0.58)			
$Antsel$		0.305	0.130	0.479
		(1.45)	(0.57)	(2.37)
NObs	444	425	438	377
$\bar{R}^2$	35.6%	36.4%	38.9%	42.1%
$Year$	Yes	Yes	Yes	Yes

Table 11
Firm- and Country-Level Analysis of Stock Price Informativeness

This table reports coefficient estimates of cross-country firm-level regressions of price informativeness ψ on various combinations of firm- and country-specific characteristics. ψ is defined in Table 9. The firm-level characteristics are $Size$, BM, Age, DY, DE, $Turn$, $Sprd$, g_{Sales}, Ret, RE, σ_{Ret}, σ_{Inc}, $MSCI$, $Accr$, $Smth$, $Corr$, $Alyst$, $Disp$, and $FErr$. The country-level characteristics are $GDPC$, $MCap$, $Credit$, g_{GDP}, σ_{GDP}, σ_{Mkt}, FDI, Seg, Law, $FTran$, and $GTran$. The acronyms of all variables are defined in Appendix B. Coefficients of Age, g_{Sales}, σ_{Inc}, $Accr$, $Smth$, $Corr$, $Alyst$, $Disp$, and $FErr$ are multiplied by 100. NObs is the number of observations; $\bar{R}^2$ is the adjusted R^2. Country and year effects are untabulated. Robust t-statistics are in parentheses. The sample period is 1996 to 2007.

Parameter	M1	M2	M3	M4	M5	M6	M7	M8
$Size$	-0.175		-0.237	-0.240	-0.189		-0.226	-0.216
	(-29.19)		(-43.65)	(-45.85)	(-21.45)		(-27.62)	(-26.28)
BM	-1.091		0.233	-0.262	-1.069		0.323	0.172
	(-3.92)		(2.01)	(-1.40)	(-3.02)		(2.95)	(1.46)
Age	0.001		0.000	-0.002	-0.002		-0.004	-0.006
	(1.10)		(-0.50)	(-3.01)	(-1.51)		(-3.68)	(-5.99)
DY	0.038		0.026	0.009	0.078		0.039	0.026
	(4.23)		(3.51)	(1.29)	(6.79)		(4.11)	(2.82)
DE	-0.159		-0.012	-0.028	-0.098		0.008	-0.002
	(-16.73)		(-1.33)	(-3.27)	(-7.19)		(0.65)	(-0.15)
$Turn$	-0.088		0.103	-0.183	0.347		0.160	-0.161
	(-1.94)		(2.64)	(-3.50)	(4.28)		(2.72)	(-1.88)
$Sprd$	6.810		4.482	4.427	6.390		4.171	4.291
	(16.63)		(13.40)	(12.42)	(18.22)		(11.88)	(11.44)
g_{Sales}	0.044		0.027	0.026	0.089		0.033	0.046
	(5.78)		(4.48)	(4.43)	(5.09)		(2.29)	(3.12)
Ret	-1.017		-0.856	-0.838	-1.267		-1.195	-1.079
	(-7.95)		(-6.98)	(-6.96)	(-6.91)		(-6.72)	(-6.21)
RE	-0.087		-0.043	-0.081	-0.158		-0.038	-0.085
	(-3.82)		(-2.05)	(-3.93)	(-4.53)		(-1.17)	(-2.65)
σ_{Ret}	-1.002		-0.656	-0.896	-1.918		-1.335	-1.451
	(-11.01)		(-8.06)	(-11.03)	(-13.46)		(-10.44)	(-11.36)
σ_{Inc}	0.000		0.000	0.000	0.000		0.000	0.000
	(-1.45)		(-1.89)	(-1.63)	(-1.27)		(-0.45)	(-0.79)
$MSCI$	-0.359		-0.221	-0.193	-0.287		-0.114	-0.077
	(-18.96)		(-14.11)	(-12.99)	(-13.04)		(-6.02)	(-4.21)
$Accr$	-0.006		-0.011	-0.006	-0.012		-0.020	-0.015
	(-2.42)		(-5.01)	(-2.86)	(-3.28)		(-6.00)	(-4.63)
$Smth$	0.087		0.028	0.016	0.065		0.009	0.013
	(6.92)		(2.46)	(1.44)	(3.97)		(0.57)	(0.87)
$Corr$	0.118		0.075	0.051	0.145		0.122	0.107
	(6.45)		(4.51)	(3.14)	(6.01)		(5.51)	(4.96)
$Alyst$					0.005		0.000	-0.001
					(2.57)		(-0.13)	(-0.55)
$Disp$					-0.326		-0.145	-0.127
					(-9.57)		(-4.82)	(-4.28)
$FErr$					-0.030		0.000	-0.006
					(-4.49)		(0.02)	(-1.02)
$GDPC$		-0.163	-0.118			-0.159	-0.117	
		(-12.20)	(-11.69)			(-9.87)	(-8.24)	
$MCap$		0.269	0.229			0.261	0.277	
		(37.42)	(30.67)			(22.88)	(27.15)	
$Credit$		-0.239	-0.105			-0.201	-0.119	
		(-11.57)	(-6.09)			(-8.92)	(-5.93)	
g_{GDP}		2.418	4.104			2.299	2.927	
		(6.22)	(12.97)			(5.00)	(7.28)	
σ_{GDP}		-9.854	-10.737			-10.672	-11.195	
		(-17.33)	(-22.38)			(-14.82)	(-16.34)	
σ_{Mkt}		-3.614	-2.916			-2.953	-2.839	
		(-28.60)	(-27.28)			(-17.74)	(-19.24)	
FDI		-0.195	-0.288			-0.605	-1.055	
		(-3.10)	(-2.79)			(-5.71)	(-10.15)	
Seg		1.300	-2.234			-0.273	-3.847	
		(1.89)	(-3.93)			(-0.31)	(-4.86)	
Law		1.375	1.123			1.378	0.988	
		(21.17)	(22.52)			(17.92)	(14.76)	
$FTran$		0.192	0.349			0.283	0.366	
		(10.74)	(23.38)			(13.82)	(18.85)	
$GTran$		-0.069	-0.221			-0.057	-0.115	
		(-4.79)	(-19.17)			(-3.22)	(-7.47)	
NObs	97,624	97,624	97,624	97,624	55,206	55,206	55,206	55,206
$\bar{R}^2$	23.5%	15.0%	33.8%	34.6%	20.6%	19.4%	30.6%	31.2%
$Year$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$Country$	No	No	No	Yes	No	No	No	Yes

Table 12
Effects of Informed Trading on Price Informativeness

This table reports coefficient estimates of cross-country firm-level regressions shown in M1-M4, (or M5-M8), which correspond to models M1, M4, M7, and M8 of Table 11, except with the inclusion of EMG, OPA, and PIN, and their interactions. M1-M4 incorporate the dummy variable EMG, whereas M5-M8 incorporate the dummy variable OPA. The dependent variable is ψ, and the independent variables are firm- and country-level characteristics and PIN. ψ is defined in Table 9, and all variables are defined in Appendix B. *NObs* is the number of observations; $\bar{R}^2$ is the adjusted R^2. Country and year effects are untabulated. Robust t-statistics are in parentheses. The sample period is 1996 to 2007.

	Base Models				With EMG Dummy Variable				With OPA Dummy Variable			
Parameter	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
$Accr$	-0.011	-0.005	-0.019	-0.013	-0.010	-0.005	-0.018	-0.013	-0.010	-0.005	-0.018	-0.013
	(-4.83)	(-2.41)	(-5.63)	(-4.07)	(-4.37)	(-2.35)	(-5.39)	(-4.05)	(-4.35)	(-2.36)	(-5.37)	(-4.07)
$Smth$	0.037	0.024	0.011	0.014	0.052	0.024	0.021	0.015	0.052	0.024	0.020	0.014
	(3.29)	(2.15)	(0.74)	(0.97)	(4.56)	(2.14)	(1.36)	(0.98)	(4.60)	(2.13)	(1.35)	(0.97)
$Corr$	0.071	0.043	0.105	0.090	0.084	0.043	0.112	0.090	0.084	0.043	0.113	0.090
	(4.21)	(2.63)	(4.64)	(4.07)	(4.96)	(2.61)	(4.93)	(4.07)	(5.00)	(2.62)	(4.97)	(4.07)
$Alyst$			-0.002	-0.002			0.002	-0.002			0.002	-0.002
			(-1.14)	(-1.16)			(0.98)	(-1.25)			(1.03)	(-1.22)
$Disp$			-0.125	-0.094			-0.149	-0.094			-0.147	-0.094
			(-4.16)	(-3.18)			(-4.96)	(-3.20)			(-4.87)	(-3.19)
$FErr$			-0.001	-0.007			-0.002	-0.007			-0.002	-0.007
			(-0.08)	(-1.12)			(-0.25)	(-1.12)			(-0.27)	(-1.11)
PIN	0.842	0.987	0.356	0.503	0.629	0.926	0.203	0.473	0.651	0.928	0.236	0.481
	(20.51)	(24.19)	(7.02)	(10.05)	(15.25)	(22.21)	(3.93)	(9.31)	(15.85)	(22.24)	(4.62)	(9.44)
EMG					-0.258	-2.688	-0.289	-2.800				
					(-6.32)	(-47.56)	(-4.23)	(-38.37)				
OPA									-0.278	-2.678	-0.226	-2.741
									(-7.01)	(-47.55)	(-3.44)	(-37.91)
$PIN \times EMG$					1.133	0.570	1.306	0.717				
					(9.45)	(5.04)	(5.68)	(3.16)				
$PIN \times OPA$									0.890	0.515	0.571	0.408
									(7.62)	(4.76)	(2.37)	(1.88)
$FTran$	0.380		0.368									
	(24.98)		(18.25)									
NObs	88,341	88,341	48,374	48,374	88,341	88,341	48,374	48,374	88,341	88,341	48,374	48,374
$\bar{R}^2$	35.1%	36.1%	32.1%	32.9%	34.3%	36.1%	31.3%	32.9%	34.2%	36.1%	31.3%	32.9%
$Year$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$Country$	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Firm char.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country char.	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No