Key words: probability of informed trading; private information; firm characteristics; stock returns; macroeconomic factors

Firm characteristics and information risk

Following the work of Easley et al. (2002) in documenting the effect of private information on cross-sectional stock returns, we examine the relationship between a firm's fundamental characteristics and its probability of information-based trading (PIN). We find that asset turnover and dividend yields are important firm characteristics that influence a firm's PIN. The findings also offer an alternative explanation as to why firm characteristics are informative about asset prices.

CHUAN LIAO is an Assistant Professor in Finance at the Rutgers Business School, Newark, New Jersey, USA. Email: liao@business.rutgers.edu

CHIEN-TING LIN is an Associate Professor in Finance at the Graduate Institute of Finance, National Taiwan University of Science and Technology & University of Adelaide Business School. Email: edward.lin@adelaide.edu.au

LEI XU is a Lecturer in Finance at the University of Adelaide Business School. Email: lei.xu@adelaide.edu.au

ONE STRAND OF MARKET MICROSTRUCTURE LITERATURE that has received much attention in recent years is the effect of informed trading on asset returns. It has been widely argued that trading on private information may affect cross-sectional asset returns as uninformed traders require a larger risk premium on assets with greater private information. Laying the theoretical foundations of information asymmetry in the asset pricing context, Easley et al. (1992, 1996) develop a model that examines how information is revealed in the market through a Bayesian Learning process. In their subsequent series of studies, Easley et al. (1998, and 2002) construct a metric, the probability of information-based trading (PIN), to estimate the degree to which informed trading takes place for individual stocks. They show that active (inactive) stocks tend to be associated with low (high) estimated PIN and that these correlations are robust in the presence of size and book-to-market effect. They suggest that it is the PIN risk, a risk component in the bid–ask spread that may shed light on the anomalies within the Fama–French asset pricing framework. Recent studies such as Fletcher (1995), Nyholm (2002), and Owens and Steigerwald (2005), also find similar results on the asymmetric effect of informed trading.

Although there is well-documented evidence of the importance of informed trading on the price discovery process, the required return of securities, and the efficiency of the market (see Easley et al. 1998; Easley and O'Hara 2004), other related and important questions remain unanswered. For example, how does PIN relate to firm characteristics? Since all market participants need to acquire firm information in their search for excess returns, one may also ask which financial characteristics tend to be associated with information-based trading? At the macro level, Demsetz and Lehn (1985) argue that firms operating in an uncertain economic environment are more difficult for outside investors to observe and value. It follows that information about firms may become more opaque for average traders when the state of the economy changes.[1] Therefore, another interesting question is how do business cycles affect PIN?

Our empirical analysis suggests that among the financial ratios we have identified, asset turnover (measured by the sales to total assets ratio) and dividend yields are important firm characteristics that influence a firm's information-based trading. Higher asset turnover is related to higher PIN. We argue that the positive correlation between asset turnover and higher PIN may be due to increased uncertainty of a firm's activities, which leads to greater private information. However, dividend yields are negatively related to a firm's PIN. Higher dividend yields appear to lower information asymmetry between informed and noise traders. These results remain robust after we control for the macroeconomic environment.

Data and summary statistics

Assuming that market makers trade in a competitive environment and that an information event can be classified into good or bad news on a daily basis, Easley and O'Hara (1992) develop a theoretical model in which the stock price converges towards the true and informed underlying price over time, under Bayesian Learning rules. In the process, market makers profit from trading with liquidity traders but lose from trading with fully informed traders. Since information events and the proportion of informed traders are not directly observable, Easley et al. (2002) use trading data on each day to estimate the probabilities of orders from both informed traders and liquidity traders based on different Poisson processes. The estimation of the probabilities is then used to infer probability of information-based trading (PIN) with the Maximum Likelihood method.[2]

We obtain PIN estimates from Easley et al. (2002) for all ordinary common stocks listed on the New York Stock Exchange and the American Stock Exchange from 1983 to 2001.[3] For our purposes, we exclude those stocks with discontinuous PIN estimates. Therefore, all stocks in our sample have 19 years of PIN estimates. The final sample consists of 584 stocks, 292 of which are manufacture companies, 77 are utility companies, 96 are from shops, wholesale, retail and service, 30 are from finance and money industry, and the remaining 89 are from other industries.

To provide a brief overview of the summary statistics of sampled firms, we report only average annual PIN in Table 1 and 2. The mean of each firm's average annual PIN over the sampled period is 0.193, suggesting an overall low level of informed trading in the sample. However, the

TABLE 1: **Summary statistics of sampled firms' average annual PIN**

The sample consists of 584 firms from 1983 to 2001. Firm Average is each firm's average annual PIN, Firm Min is each firm's minimum PIN, Firm Max is each firm's maximum PIN, and Firm Std is each firm's PIN standard deviation.

	Firm Average	Firm Min	Firm Max	Firm Std
Min	0.098	0.002	0.129	0.014
Max	0.430	0.296	0.895	0.189
Mean	0.193	0.108	0.292	0.050
Std	0.058	0.041	0.100	0.020

TABLE 2: **Summary statistics of firms' PIN by year**

This table reports the mean, standard deviation, minimum, and maximum of average PIN for each year from 1983 to 2001.

Year	Mean	Std	Min	Max
1983	0.215	0.069	0.071	0.498
1984	0.201	0.064	0.051	0.512
1985	0.208	0.064	0.048	0.691
1986	0.209	0.064	0.074	0.526
1987	0.211	0.071	0.046	0.511
1988	0.207	0.059	0.040	0.434
1989	0.206	0.067	0.031	0.503
1990	0.212	0.069	0.064	0.512
1991	0.210	0.075	0.074	0.629
1992	0.205	0.076	0.065	0.538
1993	0.192	0.072	0.002	0.659
1994	0.189	0.071	0.046	0.713
1995	0.186	0.072	0.052	0.643
1996	0.180	0.077	0.076	0.615
1997	0.165	0.080	0.040	0.569
1998	0.160	0.088	0.035	0.678
1999	0.160	0.088	0.030	0.596
2000	0.164	0.093	0.033	0.614
2001	0.180	0.104	0.034	0.895

average PIN varies substantially from a low of 0.098 to a high of 0.43. Its average standard deviation is about 0.05 but can be as high as 0.189 and as low as 0.014. The lowest average PIN among all firms in all years is 0.002, while the highest PIN is 0.895. This wide dispersion of average PIN among the firms during the sampled period raises the question of which firm characteristics, if any, could affect the variability of a firm's PIN.

Table 2 shows the time-variation in cross-sectional PIN attributes from 1983 to 2001. We find that the average PIN has gradually declined over the sampled period, which suggests that information asymmetry among traders has been declining in recent years. In particular, the lowest average PIN of 0.16 is found in 1998 and 1999 versus the highest average PIN of 0.215 in 1983. The standard deviation of average PIN, however, has increased from 0.069 to 0.104 over the sampled period with the largest dispersion of 0.104 in 2001 compared to the smallest dispersion of 0.059 in 1988. The increase in the difference between the minimum and the maximum average PIN in each year is also further evidence of the increased variability in the average PIN. In the next section, we examine the effect of firm characteristics on PIN.

Firm-specific factors

The predictive power of a firm's characteristics on expected stock returns has well been documented in the voluminous asset pricing literature (see Chan, Hamao and Lakonishok 1991; Fama and French 1992; Jaffe, Keim and Westerfield 1989; and Lakonishok, Shleifer and Vishny 1994). In accounting literature, the effect of different standard of accounting disclosure on market efficiency and transparency has also been thoroughly studied (Baiman and Verrecchia 1996; Botosan 1997; Bushman and Indjejikian 1995; and Dye 1998). Consequently, these studies motivate our selection of firm-specific factors.

In our paper, we focus on how well accounting information may relate to the estimated PIN. We choose one accounting proxy for each financial aspect of the sampled firms. Since most of proxies for the same firm's characteristic are highly correlated, omitting extra proxies will not affect the outcome. We include the following financial ratios and stock returns in our subsequent tests:

- Coverage ratio, leverage ratio, liquidity ratio, profitability ratio, and cash-flow-to-debt ratio measure a firm's default risk. The reliance of bond ratings on these ratios suggests that they are good measurement for a firm's creditworthiness. For example, Altman (1968) develops a discriminant model to predict firm bankruptcy using these financial ratios.
- Earnings before interest and taxes (EBIT) over total assets proxies for the profitability of the operation.
- Asset turnover or activity ratio measures a firm's efficiency in utilising its assets.
- Book-to-market equity and retained earnings to total assets indicate a firm's growth prospect and its future prospect from today's reinvestment.
- Working capital over total assets and current assets over current liabilities provide information on the effectiveness of a firm's asset allocation and liquidity.
- Intangible assets to total assets and R&D investment to total assets are proxies for a firm's cash flow uncertainty.
- Stock return as an indication of market expectation of a firm's future performance.

TABLE 3: Correlation matrix of firm-specific factors

This table reports correlations among firm-specific factors. EBIT/TA is earnings before interest and taxes to total assets ratio, S/TA is sales to total assets, MV/BV is market value to book value ratio, RE/TA is retained earnings to total assets ratio, WC/TA is working capital to total assets ratio, CA/CL is current assets to current liabilities ratio, EBIT/TI is earnings before interest and taxes to total interest ratio, R is annual stock return, D/P is dividend to price ratio, IA/TA is intangible assets to total assets ratio, and R&D/TA is research and development investment to total assets ratio.

	EBIT/TA	S/TA	MV/BV	RE/TA	WC/TA	CA/CL	EBIT/TI	R	D/P	IA/TA	R&D/TA
EBIT/TA	1.00										
S/TA	0.21	1.00									
MV/BV	0.41	0.02	1.00								
RE/TA	0.33	0.10	0.26	1.00							
WC/TA	0.13	0.31	0.29	0.26	1.00						
CA/CL	0.04	0.05	0.43	0.21	0.72	1.00					
EBIT/TI	0.07	0.01	0.13	0.05	0.04	0.05	1.00				
R	-0.09	0.01	-0.03	-0.20	-0.07	-0.01	0.00	1.00			
D/P	0.03	-0.16	-0.05	-0.02	-0.23	-0.16	-0.01	-0.01	1.00		
IA/TA	0.10	-0.01	0.03	0.02	-0.13	-0.10	-0.02	0.04	0.01	1.00	
R&D/TA	-0.16	-0.14	0.07	-0.09	0.13	0.00	-0.04	0.10	0.00	-0.03	1.00

We compute the financial ratios from CRSP/COMPUSTAT Industrial Annual merged database but exclude 78 stocks from the sample due to missing observations. Our final sample consists of 506 firms. To match a firm's estimated PIN, we also lag the financial ratios for a year to account for the delay of information disclosure as accounting information is not available until several months after the fiscal year-end.

Table 3 reports the correlation matrix of the financial ratios. Among them, working capital/total assets and liquidity ratio (current assets/current liabilities), which measure firm liquidity, have the highest correlation of 0.72. Asset return (EBIT/Total asset) and equity/debt are also correlated but with a lower correlation of 0.43. Another notable correlation is between asset return and retained earnings to total assets. It is not surprising that firms with higher retained earnings are also related to more investment opportunities and therefore higher asset return. Overall, we find that correlations among the financial ratios tend to be weak and represent a good selection to examine the effect of the firm's characteristics on its PIN.

For each year from 1983 to 2001, we run the following regression:

$$PIN_i = \alpha + \beta_1 EBIT/TA_i + \beta_2 S/TA_i + \beta_3 RE/TA_i + \beta_4 WC/TA_i + \beta_5 CA/CL_i + \beta_6 EBIT/I_i + \beta_7 R_i + \beta_8 D/P_i + \beta_9 INT/TA_i + \beta_{10} RD/TA_i + \varepsilon_i \quad (1)$$

where for firm i, $EBIT/TA_i$ is EBIT to total assets; S/TA_i is sales to total assets; RE/TA_i is retained earnings to total assets; WC/TA_i is working capital to total assets; CA/CL_i is current assets to current liabilities; $EBIT/I_i$ is EBIT to total interest; R_i is annual stock return; D/P_i is dividend to price; INT/TA_i is intangible assets to total assets; and RD/TA_i is R&D investment to total assets.[4]

The results of the regression analysis of Equation 1 are reported in Table 4. We find that firms with higher profitability (EBIT/TA) tend to be associated with less informed trading. Ranging from -0.25 to -0.10, the average coefficient of the profitability ratio is -0.207. A 1% standard deviation increase in profitability corresponds with an average decline of 1.9% in a firm's PIN. This is consistent with the notion that a firm with higher profitability tends to reduce uncertainty around it.

Contrary to the finding on firms' profitability, higher asset turnover, as measured by Sales/TA, is positively related to PIN. The effect of higher sales revenue, however, is relatively weak with coefficients ranging from 0.01 to 0.02. A firm with asset turnover six times in a year versus a firm with once in a year will have an 8% higher PIN. Our results indicate that a higher turnover implies more opportunity for informed traders.

As expected, dividend yields (dividend/price) are informative. Similar to higher profitability, higher dividends are related to lower private information. This negative effect of dividend yields on PIN suggests that dividends may matter in terms of lowering information asymmetry between traders. Our results also complement the dividend signalling hypothesis, which suggests that an increase in dividend payouts reveals information on the future prospects of the firm.

TABLE 4: Cross-sectional regressions of PIN on firm-specific factors

This table reports estimates of regressions relating PIN to firm-specific factors according to Equation 1. The regression model is as follows:

$$PIN_i = \alpha + \beta_1 EBIT/TA_i + \beta_2 S/TA_i + \beta_3 RE/TA_i + \beta_4 WC/TA_i + \beta_5 CA/CL_i + \beta_6 EBIT/I_i + \beta_7 R_i + \beta_8 D/P_i + \beta_9 INT/TA_i + \beta_{10} RD/TA_i + \varepsilon_i$$

Where EBIT/TA is earnings before interest and taxes to total assets ratio, S/TA is sales to total assets, CA/CL is current assets to current liabilities ratio, RE/TA is retained earnings to total assets ratio, WC/TA is working capital to total assets ratio, EBIT/TI is earnings before interest and taxes to total interest ratio, R is annual stock return, D/P is dividend to price ratio, IA/TA is intangible assets to total assets ratio, and R&D/TA is research and development investment to total assets ratio. The coefficients are estimated yearly from 1983 to 2001. Summary statistics are reported for the time series of the estimated coefficients. T-statistics is the ratio of the time-series mean to its standard deviation.

	Mean	Std	Min	Median	Max	T-stat
EBIT/TA	-0.207	0.090	-0.367	-0.207	-0.006	-2.303
S/TA	0.016	0.006	0.003	0.018	0.025	2.740
CA/CL	0.008	0.009	-0.008	0.007	0.024	0.874
RE/TA	-0.003	0.025	-0.059	0.002	0.042	-0.106
WC/TA	0.036	0.052	-0.067	0.040	0.134	0.698
EBIT/TI	0.000	0.000	0.000	0.000	0.000	-0.017
R	0.010	0.017	-0.020	0.012	0.033	0.591
D/P	-0.007	0.003	-0.017	-0.008	0.000	-2.174
IA/TA	-0.037	0.047	-0.119	-0.055	0.057	-0.786
R&D/TA	-0.142	0.151	-0.332	-0.198	0.125	-0.941
Adjusted R^2	0.243	0.097	-0.004	0.245	0.441	2.504

Among other firm characteristics, we fail to find R&D or intangible assets to be an important factor in a firm's average PIN. This result is rather surprising since standard finance theory suggests that firms with more intangible assets tend to generate more value from their growth opportunities rather than from assets in place. It follows that these firms have larger information risk. However, intangible assets appear not to be a source of private information.

It is also interesting to note that the financial ratios increase explanatory power chronologically. Adjusted R-square reaches a high of 0.44 in 2001 compared to a lower level of 0.097 in 1984. Whether the trend results from the time-varying explanatory power of the firm-specific factors, or from other economic factors that we fail to control, remains an open question. In our subsequent analysis, we examine the roles of macroeconomic variables on PIN.

Macroeconomic factors

In this section, we control the effect of the macroeconomic environment on a firm's asymmetric information. We choose the following well-known and most followed macroeconomic factors:

- Three-month Treasury bill rate as proxy for the risk-free rate.
- The difference between the 10-year treasury and 3-month Treasury bill rate to estimate the term premium.
- The difference between the return on Moody's high-yield bond index and the 10-year Treasury rates for the default premium.
- Changes in Consumer Price Index (CPI) to measure the inflation rate.
- The change in the Industrial Production Index to estimate economic growth.
- Gold price as proxy for the strength of the US dollar around the world.

As expected, dividend yields (dividend/price) are informative. Similar to higher profitability, higher dividends are related to lower private information. This negative effect of dividend yields on PIN suggests that dividends may matter in terms of lowering information asymmetry between traders.

- Unemployment rates as proxy for consumers' confidence about the state of the economy.
- S&P 500 composite and Dow Jones Industrial Average as proxy for a market portfolio.

Table 5 shows that the cross-correlations among the macroeconomic variables are generally low. The most notable correlations are those between the risk-free rate (R_f) and change in CPI, and term premium and change in unemployment rate. Their correlations are 0.91 and 0.71, respectively. The risk-free rate is highly correlated with the change in the CPI as the inflation rate is the primary component of the risk-free rate according to the Fisher effect. The change in the unemployment rate is widely known as a good predictor of the short-term future interest rate. An increase (decrease) in the unemployment rate is associated with a lower (higher) future interest rate, which is in turn related to a higher (lower) term premium. The low correlations for the rest of the variables suggest that the choices of the macroeconomics factors are appropriate for our subsequent regression analysis.

TABLE 5: Correlation matrix of macroeconomic factors

This table reports the correlations between the macroeconomic factors. R_f is the three-month T-bill rate. Term is the yield difference between the 10-year T-bond and the three-month T-bill. Default is the yield difference between the government bond index and corporate bond index with similar term to maturity. DIP is the growth rate of annual industrial production. DUR is the percentage change in unemployment rate. DGDP is the growth rate in GDP. DCPI is the percentage change in CPI index. DGold is the percentage change in gold price. S&P 500 is the annual return of Standard & Poor's 500.

	R_f	Term	Default	DIP	DUR	DGDP	DCPI	DGold	S&P 500
R_f	1.00								
Term	-0.12	1.00							
Default	-0.39	-0.14	1.00						
DIP	0.39	0.00	-0.20	1.00					
DUR	0.36	0.71	-0.17	0.14	1.00				
DGDP	0.35	-0.22	-0.21	0.17	-0.11	1.00			
DCPI	0.91	0.01	-0.47	0.05	0.16	0.00	1.00		
DGold	-0.34	0.08	0.40	-0.22	0.00	-0.26	-0.21	1.00	
S&P 500	0.15	-0.21	-0.21	0.01	0.18	0.33	-0.16	0.12	1.00

To test the relationship between firm characteristics and PIN in the absence of economic environment changes, we follow the literature by controlling the risk exposure of PIN to macroeconomic variables. We first run the following time-series regression for each firm to obtain the parameters of different macroeconomics factors for each firm:

$$PIN_t^i = \alpha + \gamma_k^i MACRO_{k,t} + \varepsilon_t^i \quad (2)$$

Where $MACRO_{k,t}$ is the macroeconomic variable k at time t as described above.

We take γ_k^i as a particular attribute of the firm as for all the other financial variables and run a cross-sectional regression of the firm's PIN on both firm characteristics and the firm's specific exposure to macroeconomic risks. This regression is run for all sample years:

$$PIN_i = \alpha + \beta_1 LASTR_i + \beta_2 LSTA_i + \beta_3 LREA_i + \beta_4 LWCA_i + \beta_5 LCA\_CL_i + \beta_6 LCVR_i + \beta_7 LEQTYRD_i + \beta_8 LD\_P_i + \beta_9 LINTAG_i + \beta_{10} LR\_D_i + \Sigma\beta_{1k}\gamma_k^i + \varepsilon_i \quad (3)$$

The summary statistics of the regression results are reported in Table 6. Two of the three financial ratios, asset turnover (S/TA) and dividend yields (D/P), remain significant after exposures to macroeconomic factors are controlled. Their economic impacts on PIN are also largely unaffected where the coefficient of asset turnover drops slightly from 0.016 to 0.012, while the coefficient of dividend yield is unchanged. Therefore, we continue to find that higher sales as a proportion of total assets create larger asymmetric information. However, higher dividend yields or higher dividend payouts, a characteristic of lower growth firms, correspond with lower private information and thereby lower PIN.

Conclusions

In this paper, we extend the work of Easley et al. (2002) who report that PIN dominates asset-pricing factors that include beta, size, liquidity and volume. In particular, we examine the roles of firm characteristics and the

TABLE 6: Cross-sectional regressions of PIN on all factors

This table reports estimates of regressions relating PIN to firm-specific factors according to Equation 5. The regression model is as follows:

$$PIN_i = \alpha + \beta_1 LASTR_i + \beta_2 LSTA_i + \beta_3 LREA_i + \beta_4 LWCA_i + \beta_5 LCA_i\_CL_i + \beta_6 LCVR_i + \beta_7 LEQTYRD_i + \beta_8 LD\_P_i + \beta_9 LINTAG_i + \beta_{10} R\_D_i + \Sigma\beta_{1k}\gamma_k^i + \varepsilon_i$$

Where EBIT/TA is earnings before interest and taxes to total assets ratio, S/TA is sales to total assets, CA/CL is current assets to current liabilities ratio, RE/TA is retained earnings to total assets ratio, WC/TA is working capital to total assets ratio, EBIT/TI is earnings before interest and taxes to total interest ratio, R is annual stock return, D/P is dividend to price ratio, IA/TA is intangible assets to total assets ratio, and R&D/TA is research and development investment to total assets ratio. γ_k^i is obtained from the regression, $PIN_t^i = \alpha + \gamma_k^i MACRO_{kt} + \varepsilon_i$. The coefficients are estimated yearly from 1983 to 2001. Summary statistics are reported for the time series of the estimated coefficients. T-statistics is the ratio of the time-series mean to its standard deviation.

	Mean	Std	Min	Median	Max	T-stat
EBIT/TA	-0.120	0.076	-0.243	-0.140	0.062	-1.582
S/TA	0.012	0.005	0.004	0.011	0.026	2.352
CA/CL	0.004	0.008	-0.006	0.006	0.021	0.645
RE/TA	0.007	0.016	-0.028	0.003	0.044	0.450
WC/TA	0.014	0.040	-0.078	0.009	0.073	0.357
EBIT/TI	0.000	0.000	0.000	0.000	0.000	-0.298
R	0.006	0.014	-0.016	0.008	0.034	0.460
D/P	-0.007	0.003	-0.014	-0.007	0.000	-2.234
IA/TA	-0.016	0.027	-0.080	-0.012	0.022	-0.593
R&D/TA	-0.174	0.105	-0.372	-0.164	0.020	-1.656
R_f	0.989	4.304	-9.261	0.790	7.209	0.230
Term	-0.185	2.589	-3.679	-0.641	4.508	-0.072
Default	-0.114	0.687	-1.338	-0.205	1.503	-0.166
DIP	1.351	2.389	-3.204	1.204	6.553	0.566
DUR	-1.481	4.103	-8.755	-0.870	5.607	-0.361
DGDP	-1.339	2.197	-7.955	-0.938	1.660	-0.609
DCPI	-1.281	2.484	-6.784	-0.994	2.780	-0.516
DGold	5.775	16.355	-26.071	6.353	35.342	0.352
R_m	5.637	26.996	-39.086	8.244	62.202	0.209
Adjusted R^2	0.549	0.133	0.310	0.527	0.803	4.137

macroeconomic environment in explaining the cross-sectional variation in the probability of informed trading (PIN). Based on the estimates of PIN from Easley et al. (2002), we find that asset turnover and dividend yields are important sources of financial information for PIN. A higher asset turnover (i.e. sales to asset ratio) may relate to greater uncertainty of a firm and therefore it increases its PIN. On the other hand, a higher dividend yield mitigates information asymmetry about the firm between traders and lowers its PIN. Macroeconomic factors, however, appear to have little effect on PIN.

Our analysis suggests a number of directions for future research. Given the evidence that informed trading is related to some firm characteristics, a robustness check on the correlations between firm characteristics and other estimates of PIN is warranted. For example, an ordered probit approach (Fletcher 1995; GMM method – Handa, Schwartz and Tiwari 1998) and Bayesian technique (Davies 2004) are also used to measure the existence of information. Furthermore, Nyholm (2002) estimates PIN with intra-day trading data rather than with daily data (Easley et al. 2002). On the basis of our findings that certain firm characteristics do attract more informed traders (or at least attract some traders to acquire information), another question arises: What is the underlying rationale for these observations?

A higher asset turnover (i.e. sales to asset ratio) may relate to greater uncertainty of a firm and therefore it increases its PIN. On the other hand, a higher dividend yield mitigates information asymmetry about the firm between traders and lowers its PIN.

Notes

1 Firms, however, may also have an incentive to disclose information to counter the increase in information asymmetry during these particular periods of uncertainties.

2 We refer readers to Easley et al. (2002) for more information on the estimation algorithm.

3 We thank Soeren Hvidkjaer for generously providing the PIN estimates.

4 Since both CA/CL_i and WC/TA_i measuring liquidity have a strong correlation, we also conduct robustness tests with both of the ratios in the regressions. However, the results are similar to those reported in Table 4 and are therefore not reported.

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