

Dang Tùng Lâm; Nguyen Trang Phuong Doan; Thi Minh Hue Nguyen; Thanh Thao Tran; Xuan Vinh Vo

Article

Analysts and stock liquidity: Global evidence

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*Corresponding author: Xuan Vinh Vo,
Institute of Business Research,
University of Economics, Ho Chi Minh
City, Vietnam
Email: vxvinh@yahoo.com

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David McMillan, University of Stirling,
UK

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FINANCIAL ECONOMICS | RESEARCH ARTICLE

Analysts and stock liquidity – Global evidence

Tung Lam Dang¹, Nguyen Trang Phuong Doan¹, Thi Minh Hue Nguyen², Thanh Thao Tran³ and Xuan Vinh Vo^{3,4*}

Abstract: This paper investigates the relation between analyst coverage and stock liquidity with a focus on the role of information produced by financial analysts. Using a comprehensive dataset across 41 countries for the period 2000–2010, we document two novel findings. First, analyst coverage is positively correlated with stock liquidity. Second, the positive effect of analyst following on stock liquidity is attributed to the weak institutional environment. These findings suggest that financial analysts provide more public information to market participants and thus improve stock liquidity. This effect is attenuated in a country with a stronger institutional environment.

Subjects: G10; G14; G15

Keywords: Analyst coverage; stock liquidity

1. Introduction

Financial analysts are important players in maintaining stock market efficiency and reducing stock market volatility (Andrade, Bian, & Burch, 2013). Common roles of financial analysts are to make buy/sell recommendations to brokerage firms and their clients with the objectives of making better investment decisions. Analysts might influence stock prices because they provide forecasts on

ABOUT THE AUTHORS

Tung Lam Dang is from the University of Economics, The University of Danang. Tung Lam Dang is also a visiting professor and research fellow at the University of Economics Ho Chi Minh City. Email: dangtlam@due.edu.vn

Nguyen Trang Phuong Doan is from the University of Economics, The University of Danang. Nguyen Phuong Doan is also a visiting professor and research fellow at the University of Economics Ho Chi Minh City. Email: phuongdnt@due.edu.vn

Thi Minh Hue Nguyen is from the National University of Economics, Vietnam. Minh Hue Nguyen is also a visiting professor and research fellow at the University of Economics Ho Chi Minh City.

Thanh Thao Tran is from the Institute of Business Research, University of Economics Ho Chi Minh City, Vietnam.

Xuan Vinh Vo is from the Institute of Business Research, University of Economics Ho Chi Minh City, Vietnam and CFVG Ho Chi Minh City, University of Economics Ho Chi Minh City, Vietnam.

PUBLIC INTEREST STATEMENT

Information is critical in stock markets and an important source of information is from financial analysts. This work examines the link between analyst coverage and stock liquidity. Using a comprehensive dataset across 41 countries for the period 2000–2010, we document two novel findings. First, analyst coverage is positively correlated with stock liquidity. Second, the positive effect of analyst following on stock liquidity is attributed to the weak institutional environment. These findings suggest that financial analysts provide more public information to market participants and thus improve stock liquidity. This effect is attenuated in a country with a stronger institutional environment. This research is funded by the University of Economics Ho Chi Minh City. All authors contribute equally in this paper and the names of authors are listed following the alphabetical order of the author's surname.

future earnings and other pertinent financial variables which are important to equity valuation (Jiang, Kim, & Zhou, 2011). In general, analysts' roles imply the production of information to market participants, which may result in an increase in public information or a rise in privately informed trade and thus affect stock liquidity (Roulstone, 2003). While there may be several mechanisms through which analyst following is correlated with stock liquidity, researchers often concentrate on theories of trading with an emphasis on financial analysts' role of generating public information to market participants and thus reduce information asymmetry (Farber, Huang, & Mauldin, 2018) and therefore improve stock liquidity.

In this paper, we examine whether the number of financial analysts following affects stock market liquidity. More specifically, we address the following questions: (1) is there a connection between the number of analysts following the firm and stock liquidity? and (2) how does institutional factor moderate the liquidity effect of analyst coverage?

In this study, we use a comprehensive dataset of firms' analyst coverage and stock liquidity across 41 countries over the period of 2000–2010. Our two key variables are analyst coverage and stock liquidity. We obtain analyst coverage data from the Institutional Brokers' Estimate System (I/B/E/S). Analyst coverage is defined as the logarithm of one plus number of financial analysts covering a firm in a given year. To measure a stock's liquidity, we rely on two proxies commonly used in literature: the percentage effective spread and Amihud's (2002) illiquidity measure. Liquidity measures are estimated using intraday transaction data from Thomson Reuters Tick History (TRTH) and daily transaction data from Datastream. We also control in our analyses for a variety of firm-specific characteristics, country-fixed, industry-fixed, and year-fixed effects to eliminate the possibility that our results simply reflect omitted correlated variables.

We find that firms' analyst coverage is positively related to stock liquidity, which suggests that more analysts following a firm result in a production of more information available about the firm and then result in higher stock liquidity. Our results are consistent across subsamples (i.e. the global sample, the developed versus emerging markets, the U.S. versus non-U.S. markets, during crisis period versus non-crisis period) and alternative measures of stock liquidity. To mitigate the concern that the results can be driven by an endogenous relation between analyst coverage and stock liquidity, we also employ several alternative specifications, including firm-fixed effects, controlling for the lagged dependent variable, or adopting a difference-in-difference approach as additional checks. Results are robust to these specifications.

In this paper, we also investigate whether country-level institutional environments matter in determining the relation between analyst coverage and stock liquidity. The prior literature suggests that country-level institutional infrastructure can act as a substitute for firm-level corporate governance (Doidge, Karolyi, & Stulz, 2007; Dyck & Zingales, 2004). In addition, many authors demonstrate that country with strong institutional characteristics induces more firm-specific information disclosure to the market, resulting in higher stock liquidity (Ball, Kothari, & Robin, 2000; Bushman & Piotroski, 2006; Hope, 2003; Leuz, Nanda, & Wysocki, 2003). We thus expect that the association between analyst coverage and stock liquidity is attenuated in countries with strong institutional environments. We study this effect by dividing the entire sample into sub-samples: high versus low institutional environment relying on five alternative proxies that are the measures of the institutional environment at the country level. We find that the positive effects of analyst coverage on stock liquidity are attenuated in countries with stronger institutional environments. This finding suggests that the quality of country-level institutions has a role in mitigating the impact of analyst coverage on stock liquidity, which makes stock liquidity less sensitive to the firm information environment.

Similar to previous studies (for example, Roulstone (2003)), this research adds to the existing literature by substantiating the importance of financial analyst following in improving liquidity in securities markets. Our findings confirm the notion suggested in previous studies that analyst activities provide public information that reduces information asymmetries between firms and market participants (Roulstone, 2003). First, our study advances our understanding of the relation between analyst coverage and stock liquidity in global markets. Most prior evidence on the effects

of analyst coverage on stock liquidity focuses in a single country, for example, the U.S. market (Jiang & Kim, 2005; Roulstone, 2003) and Vietnam stock market (Vo & Tran, 2016). Given that corporate governance mechanism, regulatory provisions, trading environments are different across countries, which can affect institutions' informational advantages and trading behaviours (Brockman, Chung, & Yan, 2009; Ferreira & Matos, 2008), the liquidity effect of analyst coverage might also be different, or even not exist, among countries. Second, our paper is the first study finding that the quality of country-level institutions has a role in mitigating the impact of analyst coverage on stock liquidity.

The remainder of this paper is organized as follows. Section 2 develops the main hypotheses of the paper and reviews the prior literature in this area. Section 3 describes our data sources and the variable construction procedure. Section 4 presents empirical evidence of the link between firms' analyst coverage, stock liquidity and institutional environments. We conclude the paper in Section 5.

2. Hypothesis development

According to Roulstone (2003), the trading theory suggests that the relation between analyst following and stock liquidity is dependent on how analysts provide information to other stock market participants. In other words, this link is dependent on whether there results in an increase in public information or an increase in privately informed trade. In terms of public information perspective, more analysts covering a firm produce more information about the firm and if analyst information is quickly disseminated to large numbers of market participants, then high analyst following represents a good information environment for uninformed or partially informed market participants. Thus, more analysts analyzing the firm should result in more information available to specialists, resulting in higher stock liquidity. The role of analysts in providing public information is clarified in many studies (Barron, Byard, & Kim, 2002; Farber et al., 2018; Francis, Schipper, & Vincent, 2002; Staglianò, La Rocca, & Gerace, 2018; Sundgren, Mäki, & Somoza-López, 2018). These papers find that analyst information does not appear to substitute for public disclosure; rather, it complements the earnings news released at the announcement. Brennan and Subrahmanyam (1995) and Roulstone (2003) emphasize the positive effect of analyst coverage on stock liquidity by providing information to financial markets. Firms with many analysts following exhibit better liquidity (such as smaller spreads and larger depths) and a lower degree of information asymmetry.

Alternatively, analysts may produce a private information to a limited number of market participants who pay to become informed and take this information advantage to compete over uninformed market participants. The number of analysts covering a firm in this case proxies for the number of informed traders. Chung, McInish, Wood, and Wyhowski (1995) and Van Ness, Van Ness, and Warr (2001) conjecture that the value of private information increases with information asymmetry, and market makers post wider spreads for stocks that are followed by more analysts (Jiang et al., 2011). Easley, O'Hara, and Paperman (1998) find that stocks with more analysts are associated with more informed trades, but they have even greater uninformed trade rates and thus analysts serve to increase trading volume by showcasing stocks to uninformed traders. Moreover, they report a negative association between analysts following and stock liquidity and suggest that financial analysts have a greater incentive to follow stocks with greater information asymmetry.

In summary, although researchers agree that analyst coverage should be related to stock liquidity, empirical evidence on the direction of the relationship is far from conclusive. Accordingly, we concur with previous papers that an increase in the number of analysts following a firm should result in greater liquidity in the firm's stock (Roulstone, 2003). The following hypothesis specifies the predicted relationship between analyst coverage and stock liquidity:

Hypothesis 1: Liquidity is positively associated with the number of analysts following the firm.

We proceed to investigate whether country-level institutional features matter to the relation between analyst coverage and stock liquidity. Previous studies suggest that country-level characteristics play an important role in determining market liquidity. For example, Jensen (1993) and Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998) assert that strong country-level institutional characteristics significantly alleviate the agency conflicts which are associated with poor firm-level corporate governance. Several studies (Ball et al., 2000; Bushman & Piotroski, 2006; Hope, 2003; Leuz et al., 2003) demonstrate that country with strong institutional characteristics induces more firm-specific information disclosure to the market, which results in higher stock liquidity. In a single country setting, Vo and Tran (2016) also confirm a positive link between liquidity and analysis coverage. We thus expect that the association between analyst coverage and stock liquidity is attenuated in countries with strong institutional environments. Therefore, our second hypothesis is stated as follows:

Hypothesis 2: The positive association between firms' analyst coverage and stock liquidity is weaker in countries with strong institutional environments.

3. Data and sample description

The key variables in our analyses include firms' analyst coverage, stock liquidity and proxies for institutional environments. We collect data from several sources to construct these firm-level variables across 41 countries over the period between 2000 and 2010. Specifically, accounting data are from Worldscope; data on analyst coverage come from the Institutional Brokers' Estimate System (I/B/E/S); liquidity measures are estimated using intraday transaction data from Thomson Reuters Tick History (TRTH) and daily transaction data from Datastream; stock returns and other accounting data to construct control variables are collected from Datastream/Worldscope. Institutional holding data are from the FactSet/Lionshares database.

Consistent with the prior literature, we exclude financial and utility firms from our sample because these firms are subject to special regulations on financing policies. We cover in our sample only common stocks and exclude stocks with special features such as ADRs, GDRs, warrants, trusts, funds, and non-equity securities. In addition, we use stocks from the single major exchange for each country, except for China (Shanghai Stock Exchange and Shenzhen Stock Exchange), Japan (Tokyo Stock Exchange and Osaka Stock Exchange), and the U.S. (American Stock Exchange and New York Stock Exchange), where we use two exchanges because of their equal importance in these countries.

To mitigate potential outliers, we winsorize the variables at the 1% and 99% levels or exclude extreme values when appropriate. Our final sample includes 202,519 firm-year observations for 21,682 firms across 41 countries.

3.1. Analyst coverage variable

A firm's analyst coverage is calculated as a logarithm of one plus number of financial analysts covering a firm. Existing empirical evidence suggests that analysts play an important role in reducing information asymmetry (e.g., Hong, Lim, and Stein (2000); Roulstone (2003); Barth and Hutton (2004); Bowen, Chen, and Cheng (2008)). The number of analysts that cover a firm is used as a proxy for information asymmetry in these researches. Even though analyst coverage is not necessarily associated with mitigating information asymmetry, as they are simply attracted to firms with less information asymmetry, the empirical evidence shows consistently that analyst following is negatively correlated with information asymmetry (Francis & Soffer, 1997; Healy & Wahlen, 1999; Lang & Lundholm, 1993). In addition, the number of analysts is also used as a proxy for the amount of information publicly available about a company (Atiase & Bamber, 1994; Imhoff Jr & Lobo 1992; Marquardt & Wiedman, 1998; Roulstone, 2003). With our focus on financial analysts' role of producing public information, a firm's analyst coverage is appropriate for our purpose to examine the relation between analysts and stock liquidity.

3.2. Liquidity proxies

Similar to Dang, Moshirian, Wee, and Zhang (2015), we use the percentage effective spread (Illiq) and Amihud's (2002) illiquidity measure (Amihud) as two proxies for stock liquidity. The percentage effective spread is defined as twice the absolute value of the difference between the trading price and the midpoint of the bid and the ask price, which is then divided by the midpoint of the bid and the asking price. To estimate the percentage effective spread, we collect intraday transaction data from the TRTH. We require a stock's trades and quotes to have been submitted during regular trading hours, and exclude irregular trades and trades with negative trading prices. Quotes with bid-ask spreads that are larger than half of their midpoint quote prices are also deleted. The annual percentage effective spread is a simple average of daily dollar volume-weighted average of percentage effective spreads in a given year.

Annual Amihud's (2002) illiquidity measure is defined as the average of daily Amihud's (2002) illiquidity measure in a given year, in which daily Amihud illiquidity measure is calculated as the absolute value of stock return divided by dollar trading volume on a given day. A higher value in the percentage effective spread and Amihud's (2002) illiquidity measure for a given stock indicates that the stock is less liquid.

3.3. Institutional environment variables

In order to assess whether and how institutional characteristics affect the impact of analyst coverage on stock liquidity, we rely on five alternative that are the measures of institutional environment at the country level proxies including: disclosure requirement index (Disreq), accounting standard index (Accsta), anti-self-dealing index (Anstel), governance transparency index (Giran) and anti-director index (Adri_pv).

Disclosure requirement index (Disreq), according to Porta, Lopez-de-Silanes, and Shleifer (2006), is defined as the average score of six disclosure sub-indexes including 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 one is assigned to the index if it signifies high-quality disclosure and 0 otherwise.

Accounting standard index (Accsta) was created by examining and rating companies' 1990 annual reports on their inclusion or omission of 90 specific accounting items, covering general information, income statements, balance sheets, funds flow statements, accounting standards, stock data, and special items. Porta et al. (1998) use this index to reflect the investor protection.

Anti-self-dealing index (Anstel) from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008) focuses on a country's disclosure quality, approval, and litigation governing self-dealing transactions.

Governance transparency index (Giran) measures the extent of governance disclosure on shareholdings and remuneration of firms' insiders and major shareholders (Bushman & Smith, 2003).

Anti-director index (Adri_pv) captures the importance of shareholder protection. The anti-director index is from Pagano and Volpin (2005) for the year 1993 to 2002. Before 1993 and after 2002, we assume the anti-director index constant over time.

3.4. Control variables

In our regression model, we control for a battery of firm-specific characteristics that can drive the relation between analyst coverage and stock liquidity in regression analyses. Control variables include book-to-market ratio (*BM*), which is defined as the log of book-to-market equity ratio; firm size (*MV*), which is defined as the log of market capitalization denominated in US dollar; closely held ownership (*CH*), which is the fraction of shares closely held by insiders and controlling

shareholders; annual stock returns (*Return*), which is annual stock returns; stock return volatility (*STD*), which is defined as the annualized standard deviation of monthly stock returns; Stock price (*Price*), which is the log of stock price in US dollars; MSCI index (*MSCI*), which is a MSCI index member dummy that equals 1 if the firm is included in an MSCI country index, and 0 (zero), otherwise; U.S. cross-listing (*ADR*), which is an ADR dummy that equals 1 if the firm was cross-listed on a U.S. exchange, and 0 (zero) otherwise; Total institutional ownership (*IO*), which is defined as the annual percentage of a firm's outstanding shares held by institutions in a given year.

3.5. Descriptive statistics

Table 1 presents the average of firm-specific variables for each of 41 sample countries. On average, firms in developed countries tend to have greater analyst coverage (0.686) than those in emerging countries (0.294). Netherlands and Spain are among the countries that have the highest transparency level as shown by highest analyst coverage while Israel is of the lowest means of analyst following.

There are significant variations in the two liquidity measures across firms and countries, *Amihud* and *Illiq*. In general, stocks in developed countries tend to be more liquid than those in emerging countries.

Table 2 reports the Pearson correlation coefficients between variables used in our analysis. As expected, our two liquidity measures are significantly correlated, with the correlation coefficient of 0.88. We also observe a negative correlation between illiquidity measures and analyst coverage, which demonstrates the hypothesized relation between key variables. In general, the correlation among variables is moderate and thus mitigates concerns related to multicollinearity in our regressions.

4. Regression results

In this section, we present empirical results on the relation among the key variables of interest. We begin with evaluating the effects of firms' analyst coverage on stock liquidity. Specifically, we perform the panel regressions of our liquidity measures on firms' analyst coverage variable while controlling for other firm-specific characteristics. Formally, our baseline regression model is of the following form:

$$\text{Stockliquidity}_{i,t} = \beta_0 + \beta_1 \text{LnAna}_{i,t-1} + \text{Controls}_{i,t-1} + \varepsilon_{i,t} \quad (1)$$

where *Stockliquidity_{i,t}* denotes stock liquidity, which is measured by either the percentage effective spread (*Illiq*) or the Amihud's illiquidity measure (*Amihud*). *LnAna_{i,t-1}* is a logarithm of one plus number of financial analysts covering a firm *i*. *Controls_{i,t-1}* is a set of firm *i*'s firm-specific control variables, including book-to-market ratio (*BM*), firm size (*MV*), closely held ownership (*CH*), annual stock returns (*Return*), stock return volatility (*STD*), stock price (*Price*), MSCI index (*MSCI*), U.S. cross-listing (*ADR*), and total institutional ownership of stock *I* (*IO*). All the independent variables are included in equation (1) with a one-year lag. We also country-fixed, industry-fixed and year-fixed effects and estimate this regression by using robust standard errors to account for heteroscedasticity and firm-level clustering.

4.1. Analyst coverage and stock liquidity

Tables 3 and Table 4 report the regression results of equation (1) for *Amihud* and *Illiq* respectively. To alleviate the concern that our results may be driven by the relative proportion of firms in developed versus emerging markets, in the U.S. versus other countries, or during the crisis period of 2007–2008, we also divide the entire sample into subsamples: developed versus emerging markets, U.S. versus non-U.S. stocks, and the crisis period versus the non-crisis period. Our primary variable of interest is analyst coverage (*LnAna*). As shown, stock liquidity is significantly positively correlated with analyst following, and the results are consistent across subsamples. For the global sample regression in Table 3, the coefficient estimate on *LnAna* is -0.528 ($t\text{-stat} = -45.33$). The results are robust when we use the

Table 1. Summary statistics of firm characteristics

Country	No.firms	No.firm-years	Illiq	Amihud	LnAna	IO	MV	BM	Return	STD	Price	CH	MSCI	ADR
Panel A: Developed markets														
Australia	1,474	12,106	-3.578	1.415	0.309	0.011	10.247	-0.640	-0.043	0.687	-1.413	0.190	0.176	0.010
Austria	54	516	-4.765	-1.155	0.657	0.042	12.536	-0.337	0.005	0.351	3.185	0.285	0.495	0.007
Belgium	128	1,326	-4.707	-0.689	0.653	0.035	12.247	-0.415	-0.011	0.336	3.733	0.222	0.313	0.007
Canada	833	7,826	-4.107	0.365	0.595	0.071	11.448	-0.579	0.009	0.617	0.576	0.071	0.284	0.100
Denmark	167	1,327	-4.132	-0.500	0.575	0.051	11.413	-0.357	-0.004	0.371	3.274	0.173	0.302	0.012
Ireland	39	418	-3.878	-0.075	0.943	0.083	12.621	-0.671	-0.039	0.470	0.781	0.228	0.548	0.133
Finland	124	1,157	-4.428	-0.536	1.231	0.093	11.957	-0.594	0.052	0.370	1.862	0.230	0.432	0.026
France	643	6,832	-4.600	0.336	0.607	0.032	11.593	-0.619	0.002	0.487	2.934	0.267	0.235	0.023
Germany	612	7,071	-3.902	1.462	0.613	0.036	11.488	-0.555	-0.156	0.564	1.856	0.206	0.078	0.016
Hong Kong	856	8,176	-3.862	0.136	0.457	0.022	11.344	-0.104	0.013	0.679	-2.431	0.441	0.425	0.009
Italy	216	2,330	-4.920	-2.648	0.870	0.029	12.827	-0.510	-0.025	0.350	1.410	0.296	0.566	0.026
Japan	2,507	26,187	-5.082	-2.358	0.684	0.031	12.301	-0.105	0.001	0.385	1.986	0.256	0.574	0.011
Netherlands	119	1,269	-4.985	-1.957	1.436	0.089	12.704	-0.693	-0.032	0.384	2.356	0.244	0.547	0.121
Norway	158	1,534	-4.008	-0.511	0.735	0.052	11.716	-0.369	0.006	0.443	1.384	0.167	0.357	0.016
New Zealand	115	876	-4.007	1.092	0.645	0.013	10.944	-0.552	0.011	0.434	-0.492	0.190	0.224	0.027
Singapore	578	5,223	-3.537	0.918	0.399	0.013	11.022	-0.181	0.012	0.519	-1.582	0.318	0.211	0.003
Spain	116	1,105	-5.694	-3.501	1.431	0.046	13.470	-0.697	0.029	0.312	2.377	0.323	0.748	0.038
Sweden	256	3,062	-4.180	-0.160	0.544	0.066	11.307	-0.753	-0.039	0.518	0.971	0.110	0.270	0.016
Switzerland	215	1,473	-4.587	-2.146	1.026	0.074	12.763	-0.513	0.039	0.325	4.910	0.319	0.535	0.034

(Continued)

Table 1. (Continued)

Country	No. firms	No. firm-years	Illiq	Amihud	LnAna	IO	MV	BM	Return	STD	Price	CH	MSCI	ADR
United Kingdom	1,650	13,112	-3.625	-0.304	0.576	0.068	11.300	-0.642	-0.112	0.488	-0.042	0.235	0.264	0.021
United States	2,048	17,128	-5.900	-4.714	1.285	0.380	13.627	-0.744	0.008	0.417	2.768	0.183	0.693	0.000
Panel B: Emerging markets														
Argentina	71	625	-4.007	1.042	0.493	0.003	11.323	0.155	-0.024	0.480	-0.099	0.183	0.402	0.145
Brazil	71	708	-3.917	-0.328	0.407	0.025	12.769	-0.665	0.147	0.638	1.589	0.231	0.663	0.022
China	1,458	13,954	-5.695	-4.368	0.170	0.009	12.639	-1.058	0.109	0.461	0.062	0.107	0.772	0.004
Chile	91	749	-3.943	0.395	0.332	0.006	12.406	-0.277	0.150	0.349	-0.617	0.417	0.552	0.130
Egypt	154	1,340	-4.090	0.153	0.119	0.003	11.632	-0.532	0.102	0.550	1.389	0.047	0.335	0.000
Greece	261	2,748	-4.123	-0.416	0.526	0.011	11.400	-0.508	-0.067	0.542	1.273	0.121	0.341	0.008
Indonesia	247	2,639	-3.382	3.203	0.362	0.010	10.388	-0.065	0.061	0.671	-2.976	0.471	0.313	0.005
India	2,059	19,152	-3.972	1.602	0.144	0.010	10.411	-0.224	0.122	0.668	-0.325	0.138	0.154	0.004
Israel	485	3,862	-3.557	1.918	0.060	0.005	10.884	-0.321	0.012	0.500	0.434	0.057	0.145	0.049
South Korea	689	5,526	-4.765	-2.266	0.406	0.019	11.159	0.377	0.019	0.617	1.760	0.161	0.447	0.009
Mexico	79	705	-4.275	0.434	0.823	0.025	12.960	-0.146	0.066	0.388	-0.091	0.118	0.544	0.206
Malaysia	887	8,843	-3.821	1.566	0.380	0.007	10.571	0.058	-0.010	0.442	-1.312	0.314	0.235	0.000
Peru	65	451	-3.372	1.561	0.186	0.002	11.510	-0.032	0.189	0.525	-0.595	0.152	0.263	0.024
Poland	242	2,387	-4.260	0.653	0.188	0.043	10.996	-0.486	0.033	0.575	1.206	0.145	0.240	0.003
Philippines	171	1,467	-3.333	3.083	0.386	0.011	10.372	0.146	0.039	0.636	-3.292	0.556	0.339	0.010
Russia	166	1,004	-3.612	1.316	0.307	0.008	13.171	-0.111	0.097	0.745	-0.408	0.162	0.264	0.014
South Africa	232	2,746	-3.677	1.836	0.479	0.028	11.001	-0.442	0.010	0.542	-0.886	0.195	0.305	0.019

(Continued)

Table 1. (Continued)

Country	No.firms	No.firm-years	Illiq	Amihud	LnAna	IO	MV	BM	Return	STD	Price	CH	MSCI	ADR
Thailand	419	3,797	-4.109	1.069	0.501	0.013	10.588	-0.074	0.080	0.481	-1.404	0.329	0.309	0.000
Turkey	254	2,796	-4.506	-1.825	0.775	0.016	11.302	-0.348	0.073	0.692	1.096	0.363	0.387	0.003
Taiwan	673	6,966	-5.068	-2.926	0.459	0.016	11.934	-0.188	0.017	0.496	-0.731	0.142	0.589	0.009
DEV	12,908	120,054	-4.501	-1.032	0.686	0.085	11.903	-0.464	-0.024	0.490	1.089	0.230	0.381	0.020
EMG	8,774	82,465	-4.368	-0.377	0.294	0.012	11.293	-0.275	0.057	0.549	-0.236	0.187	0.365	0.012
GLB	21,682	202,519												
GLB (Mean)			-4.447	-0.785	0.526	0.055	11.682	-0.396	0.007	0.512	0.588	0.213	0.375	0.017
GLB (Std. Dev)			1.250	3.737	0.855	0.154	2.185	0.977	0.702	0.469	2.404	0.283	0.484	0.128

This table reports summary statistics for firm-level key variables of interest for each of the 41 countries in the sample. Stock liquidity measures include the Amihud's illiquidity measure (*Amihud*) and the percentage effective spread (*Illiq*). Analyst coverage (*LnAna*) is the logarithm of one plus number of analysts following a firm. Definitions of the variables are given in Appendix A. DEV, EMG, and GLB denote the developed, emerging, and global markets, respectively. The sample period is from 2000 to 2010.

Table 2. Pearson correlation coefficients

VARIABLES	Amihud	Illiq	LnAna	BM	MV	MSCI	CH	Price	STD	Return	ADR	IO
Amihud	1.000											
Illiq	0.881	1.000										
LnAna	-0.568	-0.501	1.000									
BM	0.261	0.220	-0.176	1.000								
MV	-0.830	-0.747	0.691	-0.343	1.000							
MSCI	-0.640	-0.596	0.474	-0.135	0.643	1.000						
CH	0.017	0.017	0.192	0.030	0.032	0.126	1.000					
Price	-0.545	-0.563	0.397	-0.236	0.578	0.301	-0.003	1.000				
STD	0.244	0.274	-0.121	-0.035	-0.286	-0.120	-0.007	-0.240	1.000			
Return	-0.191	-0.173	0.005	-0.205	0.159	0.072	0.032	0.206	0.091	1.000		
ADR	-0.133	-0.104	0.203	-0.051	0.206	0.114	0.007	0.079	-0.020	0.003	1.000	
IO	-0.433	-0.443	0.497	-0.137	0.436	0.317	0.022	0.336	-0.090	-0.001	0.056	1.000

This table presents the Pearson correlation coefficients among variables used in the analyses of this paper. Variables include the percentage effective spread (*Illiq*); the Amihud's illiquidity measure (*Amihud*); analyst coverage (*LnAna*); book-to-market ratio (*BM*); firm size (*MV*); closely held ownership (*CH*), annual stock returns (*Return*), stock return volatility (*STD*), stock price (*Price*); MSCI index (*MSCI*), U.S. cross-listing (*ADR*), Total institutional ownership (*IO*). Definitions of the variables are given in Appendix A. The sample period is from 2000 to 2010.

Table 3. Analyst coverage and stock liquidity (Amihud's (2002) illiquidity measure)

VARIABLES	GLB (1)	DEV (2)	EMG (3)	US (4)	NUS (5)	CRS (6)	NCRS (7)
LnAna	-0.528*** (-45.33)	-0.505*** (-38.47)	-0.528*** (-24.08)	-0.295*** (-10.94)	-0.544*** (-43.92)	-0.537*** (-30.12)	-0.534*** (-44.29)
MSCI	-0.882*** (-43.52)	-1.036*** (-43.41)	-0.676*** (-19.11)	-0.841*** (-15.29)	-0.886*** (-41.48)	-1.172*** (-39.15)	-0.823*** (-39.99)
BM	-0.093*** (-10.82)	-0.052*** (-6.20)	-0.159*** (-8.02)	-0.021 (-1.23)	-0.100*** (-10.79)	-0.074*** (-5.81)	-0.101*** (-10.91)
MV	-0.951*** (-129.48)	-0.945*** (-117.40)	-0.949*** (-61.22)	-0.995*** (-60.54)	-0.936*** (-116.49)	-0.940*** (-87.91)	-0.950*** (-124.04)
CH	0.938*** (39.29)	1.028*** (36.99)	0.720*** (16.23)	1.408*** (20.12)	0.876*** (34.62)	0.917*** (25.19)	0.946*** (38.52)
ADR	-0.374*** (-7.09)	-0.349*** (-7.11)	-0.367*** (-2.76)		-0.387*** (-7.23)	-0.326*** (-4.50)	-0.374*** (-6.97)
Return	-0.410*** (-49.74)	-0.442*** (-47.08)	-0.351*** (-21.15)	-0.148*** (-5.49)	-0.421*** (-49.00)	-0.401*** (-19.36)	-0.423*** (-46.98)
STD	-0.213*** (-13.02)	-0.143*** (-7.73)	-0.386*** (-11.09)	-0.116* (-1.82)	-0.241*** (-14.01)	-0.099*** (-3.11)	-0.243*** (-13.33)
Price	-0.087*** (-14.32)	-0.113*** (-18.30)	-0.010 (-0.68)	-0.381*** (-11.31)	-0.077*** (-12.42)	-0.005 (-0.61)	-0.105*** (-16.53)
IO	-0.759*** (-16.58)	-0.565*** (-12.44)	-2.217*** (-11.27)	-0.270*** (-4.97)	-1.069*** (-12.14)	-0.792*** (-11.57)	-0.713*** (-14.86)
Fixed effects	CIV	CIV	CIV	IY	CIV	CIV	CIV

(Continued)

Table 3. (Continued)

VARIABLES	GLB (1)	DEV (2)	EMG (3)	US (4)	NUS (5)	CRS (6)	NCRS (7)
Nobs	175,646	113,859	61,787	17,708	157,938	36,630	139,016
Adj. R2	85.0%	88.2%	79.7%	92.9%	82.0%	86.0%	84.9%

This table reports the panel regression of stock liquidity on analyst coverage. The regression model is as follows:

$$Stockliquidity_{i,t} = \theta_0 + \beta_1 LnAnq_{i,t-1} + Controls_{i,t-1} + \epsilon_{i,t} \quad (1)$$

where *Stockliquidity*_{*i,t*} denotes stock liquidity, which is measured by the Amihud's illiquidity measure (*Amihud*). *LnAnq_{i,t-1}* is a logarithm of one plus number of financial analysts covering a firm *i*. *Controls_{i,t-1}* is a set of firm *i*'s firm-specific control variables, including book-to-market ratio (*BM*), firm size (*MV*), closely held ownership (*CH*), annual stock returns (*Return*), stock return volatility (*STD*), stock price (*Price*), MSCI index (*MSCI*), U.S. cross-listing (*ADR*), and total institutional ownership of stock *I* (*IO*). All the independent variables are included in equation (1) with a one-year lag. Nobs is the number of observations. Adj. R2 is the adjusted R² value. Country-fixed, industry-fixed and year-fixed effects are included (not reported). The t-statistics shown in parentheses are based on standard errors that are adjusted for heteroscedasticity and firm-level clustering. Superscripts **, * and *** denote the significance level of 10%, 5%, and 1%, respectively. The sample covers stocks across 41 countries, and the sample period is from 2000 to 2010 (from 1999 to 2009 for the lagged variables). Definitions of the variables are given in Appendix A.

Table 4. Analyst coverage and stock liquidity (Percentage effective spread)

VARIABLES	GLB (1)	DEV (2)	EMG (3)	US (4)	NUS (5)	CRS (6)	NCRS (7)
LnAna	-0.133*** (-27.01)	-0.149*** (-23.44)	-0.088*** (-12.40)	-0.149*** (-9.29)	-0.127*** (-24.61)	-0.142*** (-18.56)	-0.133*** (-26.66)
MSCI	-0.245*** (-31.31)	-0.296*** (-28.76)	-0.207*** (-18.03)	-0.512*** (-17.74)	-0.242*** (-29.94)	-0.304*** (-27.65)	-0.227*** (-28.73)
BM	-0.057*** (-17.81)	-0.047*** (-12.58)	-0.044*** (-7.70)	-0.041*** (-4.49)	-0.060*** (-18.06)	-0.061*** (-11.55)	-0.056*** (-17.26)
MV	-0.248*** (-80.68)	-0.245*** (-63.87)	-0.244*** (-44.76)	-0.248*** (-26.64)	-0.239*** (-73.35)	-0.245*** (-54.28)	-0.248*** (-79.77)
CH	0.225*** (21.76)	0.234*** (17.04)	0.144*** (9.59)	0.388*** (11.10)	0.176*** (16.50)	0.258*** (16.34)	0.214*** (20.14)
ADR	-0.021 (-0.78)	0.037 (1.21)	-0.156*** (-3.02)		-0.059** (-2.22)	-0.044 (-1.23)	-0.013 (-0.50)
Return	-0.148*** (-47.47)	-0.177*** (-44.32)	-0.112*** (-21.62)	-0.063*** (-4.18)	-0.152*** (-47.95)	-0.167*** (-21.28)	-0.158*** (-46.69)
STD	0.098*** (15.84)	0.157*** (17.79)	-0.009 (-1.01)	0.226*** (5.17)	0.084*** (13.74)	0.110*** (8.33)	0.088*** (13.61)
Price	-0.086*** (-30.57)	-0.105*** (-30.10)	-0.021*** (-4.18)	-0.284*** (-12.91)	-0.082*** (-29.10)	-0.056*** (-14.97)	-0.094*** (-32.45)
IO	-0.809*** (-30.79)	-0.750*** (-27.81)	-0.357*** (-5.57)	-0.219*** (-7.07)	-0.877*** (-21.83)	-0.739*** (-19.94)	-0.814*** (-29.46)
Fixed effects	CIV	CIV	CIV	IY	CIV	CIV	CIV

(Continued)

Table 4. (Continued)

	GLB	DEV	EMG	US	NUS	CRS	NCRS
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Nobs	158,444	101,525	56,919	14,407	144,037	34,316	124,128
Adj. R2	80.1%	83.0%	75.2%	89.5%	76.4%	81.1%	80.2%

This table reports the panel regression of stock liquidity on analyst coverage. The regression model is as follows:

$$Stockliquidity_{i,t} = \theta_0 + \theta_1 LnAnad_{i,t-1} + Controls_{i,t-1} + \epsilon_{i,t} \quad (1)$$

where *Stockliquidity*_{*i,t*} denotes stock liquidity, which is measured by the percentage effective spread (*Illiq*). *LnAnad*_{*i,t*} is a logarithm of one plus number of financial analysts covering a firm *i*. *Controls*_{*i,t*} is a set of firm *i*'s firm-specific control variables, including book-to-market ratio (*BM*), firm size (*MV*), closely held ownership (*CH*), annual stock returns (*Return*), stock return volatility (*STD*), stock price (*Price*), MSCI index (*MSCI*), U.S. cross-listing (*ADR*), and total institutional ownership of stock *I* (*IO*). All the independent variables are included in equation (1) with a one-year lag. *Nobs* is the number of observations. *Adj. R2* is the adjusted R² value. Country-fixed, industry-fixed and year-fixed effects are included (not reported). The t-statistics shown in parentheses are based on standard errors that are adjusted for heteroscedasticity and firm-level clustering. Superscripts *, **, and *** denote the significance level of 10%, 5%, and 1%, respectively. The sample covers stocks across 41 countries, and the sample period is from 2000 to 2010 (from 1999 to 2009 for the lagged variables). Definitions of the variables are given in Appendix A.

percentage effective spread measure as the dependent variable (Table 4), with the coefficient estimate of $LnAna$ for the global sample being -0.133 (t-stat = -27.01). The magnitude of results is also economically significant. Taking the global sample in Table 3 as an example, a one-standard-deviation increase in analyst coverage (0.855) results in an approximately 0.451 ($= 0.855 * (-0.528)$) increase in stock liquidity.

Most coefficient estimates of other firm-specific control variables are statistically significant as expected. For example, coefficient estimates on MV are negative and significant at the conventional 1% level, which suggests that larger firms' stocks are more liquid. Stock liquidity tends to be higher for firms with less stocks closely held by insiders and controlling shareholders. We also note that the R^2 values from the regressions are high, which suggests that the selected variables and fixed effects explain a considerable portion of the variation in stock liquidity.

In summary, the finding evidence of this paper suggests that analyst coverage has a positive effect on stock liquidity. It clarifies the role of analysts in providing public information in financial markets. Our results are consistent with Roulstone (2003) for U.S. firms.

4.2. Robustness checks

In this section, we perform several robustness checks to assess whether our findings in the previous section are reliable. The results of these analyses are presented in Table 5. Panel A of Table 5 reports results using the Amihud's illiquidity measure ($Amihud$), and Panel B of Table 5 presents results using the percentage effective spreads ($Illi$) as a liquidity proxy.

First, the relation between analyst coverage and stock liquidity is likely to be driven by unobservable heterogeneity across firms that is time-invariant or rarely changes over time. To mitigate this concern, we incorporate firm-fixed effects into equation (1). As shown in column (1) and (4) of Table 5, the coefficient estimates of $LnAna$ remain negative and statistically significant at the conventional 1% level even after controlling for firm-fixed effects. Specifically, the coefficient estimates of the analyst coverage variable are -0.271 (t-stat = -23.06) and -0.076 (t-stat = -15.27) for the Amihud's illiquidity measure and the percentage effective spread respectively.

Second, as with other corporate decisions, one of the potential concerns in our analysis is endogeneity. We mitigate this concern by regress the first-difference in stock liquidity on the one-year lag of the first-difference in analyst coverage. This regression, on the one hand, addresses the endogeneity concern that time-invariant and unobservable firm-specific characteristics can drive the liquidity effect of analyst coverage. On the other hand, it allows us to take into account the time-series covariation between the variables. As shown on Table 5 (column (2) and (5)), the coefficient estimates of $LnAna$ are significantly negative. In particular, the coefficient estimates of $LnAna$ for the Amihud's illiquidity measure and the percentage effective spread are -0.25 (t-stat = -28.47) and -0.08 (t-stat = -24.67) respectively. These empirical results confirm that analyst coverage is positively associated with stock liquidity.

Finally, the relation between analyst following and stock liquidity might be endogenous if analysts self-select to cover firms with high transparency, and stock liquidity in the previous period is highly correlated with stock liquidity in the current period. To address this issue, we repeat equation (1) including the lagged liquidity variable as a control variable. Again, results remain consistent with those in the primary analysis as shown in Column (3) and (6). Coefficient estimates of $LnAna$ for the Amihud's illiquidity measure and the percentage effective spread are -0.13 (t-stat = -28.43) and -0.034 (t-stat = -18.44) respectively.

In summary, these robustness checks confirm that our results are not driven by omitted correlated variables or endogenous bias. The results suggest that analyst coverage plays an important role in producing public information in improving stock liquidity.

Table 5. Analyst coverage and stock liquidity (Robustness check)

VARIABLES	Panel A: Amihud			Panel B: Illiq		
	Fixedeff (1)	Diff (2)	LagDep (3)	Fixedeff (4)	Diff (5)	LagDep (6)
<i>LnAna</i>	-0.271*** (-23.06)	-0.250*** (-28.47)	-0.130*** (-28.43)	-0.076*** (-15.27)	-0.080*** (-24.67)	-0.034*** (-18.44)
<i>BM</i>	-0.108*** (-9.99)	-0.107*** (-13.53)	-0.073*** (-19.09)	-0.044*** (-10.18)	-0.047*** (-15.36)	-0.027*** (-19.16)
<i>MV</i>	-0.610*** (-47.46)	-0.653*** (-69.70)	-0.219*** (-53.41)	-0.149*** (-29.86)	-0.185*** (-54.87)	-0.050*** (-33.61)
<i>CH</i>	0.432*** (16.18)	0.162*** (9.79)	0.204*** (19.83)	0.166*** (14.15)	0.021*** (2.86)	0.050*** (11.43)
<i>Return</i>	-0.324*** (-40.44)	0.182*** (27.43)	-0.502*** (-83.35)	-0.078*** (-25.15)	0.083*** (35.05)	-0.170*** (-78.84)
<i>STD</i>	-0.198*** (-13.04)	0.107*** (9.29)	-0.189*** (-15.58)	-0.003 (-0.54)	0.047*** (12.25)	-0.023*** (-6.29)
<i>Price</i>	-0.306*** (-24.90)	-0.454*** (-44.26)	-0.010*** (-4.42)	-0.152*** (-30.98)	-0.171*** (-43.74)	-0.018*** (-18.06)
<i>IO</i>	-1.387*** (-20.93)	-0.477*** (-15.28)	-0.155*** (-7.65)	-0.943*** (-27.49)	-0.014 (-1.19)	-0.164*** (-16.26)
<i>MSCI</i>			-0.386*** (-49.38)			-0.091*** (-31.86)
<i>ADR</i>	-0.233*** (-2.68)	-0.131*** (-6.87)	-0.113*** (-2.72)			-0.021*** (-2.50)

(Continued)

Table 5. (Continued)

VARIABLES	Panel A: Amihud			Panel B: Illiq		
	Fixedeff (1)	Diff (2)	LagDep (3)	Fixedeff (4)	Diff (5)	LagDep (6)
LagLiq			0.746*** (262.69)			0.792*** (216.95)
Fixed effects	FY	CIY	CIY	FY	CIY	CIY
Nobs	175,741	168,918	175,144	159,036	145,783	149,831
Adj. R2	92.0%	39.6%	92.2%	89.7%	31.9%	91.4%

This table reports the panel regression of stock liquidity on analyst coverage. The regression model is as follows:

$$Stockliquidity_{i,t} = \theta_0 + \theta_1 LnAna_{i,t-1} + Controls_{i,t-1} + \epsilon_{i,t} \quad (1)$$

where *Stockliquidity*_{*i,t*} denotes stock liquidity, which is measured by the Amihud's illiquidity measure (*Amihud*) in panel A and the percentage effective spread (*Illiq*) in panel B. *LnAna_{i,t-1}* is a logarithm of one plus number of financial analysts covering a firm *i*. *Controls_{i,t-1}* is a set of firm *i*'s firm-specific control variables, including book-to-market ratio (*BM*), firm size (*MV*), closely held ownership (*CH*), annual stock returns (*Return*), stock return volatility (*STD*), stock price (*Price*), MSCI index (*MSCI*), U.S. cross-listing (*ADR*), and total institutional ownership of stock 1 (*IO*). All the independent variables are included in equation (1) with a one-year lag. Column (1) and (4) report regression results with firm-fixed effects; Column (2) and (5) report regression results using difference-in-difference approach; Column (3) and (6) report regression results that include the lagged dependent variable as a control variable. *Nobs* is the number of observations. *Adj. R2* is the adjusted R² value. Country-fixed, industry-fixed and year-fixed effects are included (not reported). The t-statistics shown in parentheses are based on standard errors that are adjusted for heteroscedasticity and firm-level clustering. Superscripts ***, ** and *** denote the significance level of 10%, 5%, and 1%, respectively. The sample covers stocks across 41 countries, and the sample period is from 2000 to 2010 (from 1999 to 2009 for the lagged variables). Definitions of the variables are given in Appendix A.

4.3. Does country-level institutional infrastructure matter?

In this section, we examine whether the liquidity effect of analyst coverage varies systematically across countries with institutional infrastructure. Specifically, we examine whether the country-level governance mechanism and information quality affect the association between analyst coverage and stock liquidity. The results from this analysis should further enhance our understanding of the role of country-level institutional environments on corporate decisions.

According to Jensen (1993) and Porta et al. (1998), strong country-level institutional characteristics significantly alleviate the agency conflicts associated with poor firm-level corporate governance. Ball et al. (2000), Bushman and Piotroski (2006), Hope (2003) and Leuz et al. (2003) demonstrate that country with strong institutional characteristics induces more firm-specific information disclosure to the market, which results in higher stock liquidity. We expect that the association between analyst coverage and stock liquidity is attenuated in countries with strong institutional environments. We test this hypothesis by dividing the entire sample into sub-samples: high versus low institutional environment based on five alternative proxies that are the measures of the institutional environment at the country level.

Specifically, we consider three measures of the country-level governance strength: governance transparency index (*Gtran*), anti-self-dealing index (*AntSel*), anti-director index (*Adri_pv*), and two measures of country-level information quality: disclosure requirement index (*Disreq*), accounting standard index (*Accsta*).

Tables 6 and Table 7 present the regression results incorporating the effect of institutional environments for *Amihud* and *Illiq* respectively. We find that the positively significant liquidity effect of analyst coverage is higher for countries with the low institutional environment as compared to that with the high institutional environment and the results are consistent across subsamples. Specifically, the coefficient estimates of *LnAna* for the Amihud's illiquidity measure and the percentage effective spread are always lower for high institutional infrastructure sub-samples as compared to those of low institutional infrastructure. This result suggests that the effect of analyst coverage on stock liquidity is partly dependent on the institutional environments, which is consistent with previous hypothesis that in countries with strong institutional characteristics, analyst coverage is less likely to improve stock liquidity by producing public information to market participants because strong country-level governance and information transparency provide better protection for investor rights and induce more firm-specific information to the market, which thus mitigate the liquidity effect of analyst following.

5. Conclusion

In this paper, we investigate whether and how analyst coverage affects stock liquidity and whether this association is conditional on country-level institutional environments. Using a comprehensive international dataset that covers 21,682 firms across 41 countries between 2000 and 2010, we document the following two key results.

First, we find that firms with higher analyst coverage have higher stock liquidity. Our results are robust to two alternative measures of stock liquidity (i.e., the Amihud's illiquidity measure (*Amihud*), and the percentage effective spreads (*Illiq*)), in sub-samples, and with controlling for various firm-specific characteristics that may drive the relation between firms' analyst coverage and stock liquidity. This result suggests that a firms' analyst following plays an important role in generating public information to market participants and thus improve stock liquidity.

Second, we find that country-level institutional characteristics affect the impact which the firms' analyst coverage has on firms' stock liquidity. Specifically, the positive association between analyst following and stock liquidity is less pronounced in countries with stronger governance mechanism and better information transparency.

Table 6. Analyst coverage and stock liquidity: The effect of institutional environments (Amihud's (2002) illiquidity measure)

VARIABLES	Antsel		Disreq		Gtran		Adri_pv		Accsta	
	High (1)	Low (2)	High (3)	Low (4)	High (5)	Low (6)	High (7)	Low (8)	High (9)	Low (10)
LnAna	-0.498*** (-41.10)	-0.592*** (-21.05)	-0.498*** (-39.18)	-0.546*** (-22.21)	-0.478*** (-31.66)	-0.525*** (-29.56)	-0.446*** (-27.50)	-0.559*** (-35.46)	-0.446*** (-34.29)	-0.591*** (-27.23)
MSCI	-0.861*** (-38.42)	-0.811*** (-18.45)	-0.890*** (-37.36)	-0.771*** (-20.79)	-0.928*** (-34.32)	-0.776*** (-25.85)	-0.984*** (-34.42)	-0.759*** (-27.99)	-0.974*** (-41.30)	-0.691*** (-19.50)
BM	-0.096*** (-11.24)	-0.082*** (-3.40)	-0.072*** (-8.19)	-0.126*** (-5.93)	-0.089*** (-8.83)	-0.066*** (-4.38)	-0.086*** (-6.51)	-0.097*** (-8.64)	-0.069*** (-7.96)	-0.105*** (-5.52)
MV	-0.996*** (-134.67)	-0.843*** (-45.91)	-0.993*** (-125.12)	-0.877*** (-53.78)	-0.998*** (-105.84)	-0.943*** (-81.18)	-0.993*** (-99.33)	-0.944*** (-89.25)	-0.996*** (-122.57)	-0.872*** (-60.68)
CH	0.846*** (30.56)	0.972*** (20.87)	0.842*** (29.16)	0.981*** (22.49)	0.792*** (23.96)	1.067*** (31.11)	0.686*** (18.48)	1.034*** (33.09)	0.914*** (31.65)	0.786*** (18.89)
ADR	-0.278*** (-4.77)	-0.637*** (-5.79)	-0.299*** (-5.31)	-0.562*** (-5.59)	-0.364*** (-5.16)	-0.371*** (-4.78)	-0.360*** (-5.81)	-0.304*** (-3.52)	-0.352*** (-6.63)	-0.445*** (-4.21)
Return	-0.456*** (-50.95)	-0.204*** (-9.79)	-0.476*** (-50.90)	-0.220*** (-11.92)	-0.519*** (-49.68)	-0.269*** (-19.40)	-0.447*** (-37.96)	-0.421*** (-35.64)	-0.478*** (-50.22)	-0.278*** (-17.42)
STD	-0.255*** (-13.63)	-0.095*** (-2.87)	-0.214*** (-11.35)	-0.241*** (-7.20)	-0.254*** (-11.41)	-0.165*** (-7.06)	-0.224*** (-9.52)	-0.175*** (-7.89)	-0.143*** (-7.64)	-0.434*** (-12.45)
Price	-0.098*** (-15.24)	-0.025* (-1.65)	-0.080*** (-12.08)	-0.079*** (-5.58)	-0.095*** (-14.17)	-0.043*** (-3.51)	-0.107*** (-13.99)	-0.031*** (-3.21)	-0.118*** (-18.58)	0.025* (1.74)
IO	-0.647*** (-13.87)	-1.475*** (-9.12)	-0.660*** (-13.92)	-1.238*** (-8.65)	-0.576*** (-4.98)	-0.853*** (-15.82)	-0.538*** (-10.79)	-1.599*** (-12.70)	-0.600*** (-13.13)	-1.354*** (-8.49)
High-Low [p-value]	0.094 [0.002]		0.048 [0.081]		0.047 [0.042]		0.113 [<0.001]		0.145 [<0.001]	
Fixed effects	CIY	CIY	CIY	CIY	CIY	CIY	CIY	CIY	CIY	CIY

(Continued)

Table 6. (Continued)

VARIABLES	Antsel		Disreq		Gtran		Adri_pv		Accsta	
	High (1)	Low (2)	High (3)	Low (4)	High (5)	Low (6)	High (7)	Low (8)	High (9)	Low (10)
Nobs	137,846	37,800	126,836	48,810	90,234	85,412	77,630	98,016	118,879	56,767
Adj. R2	86.1%	79.8%	86.1%	82.7%	83.1%	86.1%	87.8%	82.1%	87.8%	79.4%

This table reports the firm-level panel regression of analyst coverage on stock liquidity (proxied by Amihud's (2002) illiquidity measure), and other firm-level control variables. The effect of country-level institutional environments on the relation between analyst coverage and stock liquidity is incorporated by dividing the entire sample into sub-samples: high versus low institutional environment based on five alternative proxies that are the measures of institutional environment at the country level: *Anstel*, *Disreq*, *Gtran*, *Adri_pv* and *Accsta*. The regression model is as follows:

$$Stockliquidity_{i,t} = \theta_0 + \theta_1 LnAnd_{i,t-1} + Controls_{i,t-1} + \epsilon_{i,t} \quad (1)$$

where *Stockliquidity* denotes stock liquidity, which is measured by the Amihud's illiquidity measure (*Amihud*). *LnAnd_{i,t-1}* is a logarithm of one plus number of financial analysts covering a firm *i*. *Controls_{i,t-1}* is a set of firm *i*'s firm-specific control variables, including book-to-market ratio (*BM*), firm size (*MV*), closely held ownership (*CH*), annual stock returns (*Return*), stock return volatility (*STD*), stock price (*Price*), MSCI index (*MSCI*), U.S. cross-listing (*ADR*), and total institutional ownership of stock *i* (*IO*). All the independent variables are included in equation (1) with a one-year lag. Column (1), (3), (5), (7) and (9) report regression results with high institutional environment while column (2), (4), (6), (8) and (10) report regression results with low institutional environment. *Nobs* is the number of observations. *Adj. R2* is the adjusted R² value. Country-fixed, industry-fixed and year-fixed effects are included (not reported). The t-statistics shown in parentheses are based on standard errors that are adjusted for heteroscedasticity and firm-level clustering. Superscripts **, and *** denote the significance level of 10%, 5%, and 1%, respectively. The sample covers stocks across 41 countries, and the sample period is from 2000 to 2010 (from 1999 to 2009 for the lagged variables). Definitions of the variables are given in Appendix A.

Table 7. Analyst coverage and stock liquidity: The effect of institutional environments (Percentage effective spread)

VARIABLES	Antsel		Disreq		Gtran		Adri_pv		Accsta	
	High (1)	Low (2)	High (3)	Low (4)	High (5)	Low (6)	High (7)	Low (8)	High (9)	Low (10)
LnAna	-0.118*** (-22.83)	-0.184*** (-15.58)	-0.119*** (-21.92)	-0.146*** (-14.22)	-0.118*** (-17.51)	-0.132*** (-18.66)	-0.128*** (-19.13)	-0.132*** (-19.83)	-0.117*** (-20.47)	-0.126*** (-14.06)
MSCI	-0.269*** (-31.65)	-0.085*** (-4.60)	-0.285*** (-31.02)	-0.109*** (-7.37)	-0.285*** (-26.57)	-0.188*** (-16.88)	-0.335*** (-28.22)	-0.161*** (-15.93)	-0.316*** (-33.47)	-0.107*** (-7.96)
BM	-0.066*** (-19.04)	-0.027*** (-3.71)	-0.065*** (-17.44)	-0.024*** (-3.84)	-0.072*** (-17.95)	-0.029*** (-5.64)	-0.068*** (-14.77)	-0.049*** (-11.40)	-0.057*** (-15.06)	-0.039*** (-6.86)
MV	-0.264*** (-79.61)	-0.215*** (-30.25)	-0.259*** (-73.86)	-0.231*** (-36.09)	-0.259*** (-64.21)	-0.252*** (-54.12)	-0.279*** (-62.92)	-0.235*** (-54.58)	-0.251*** (-68.21)	-0.247*** (-44.03)
CH	0.194*** (17.16)	0.212*** (9.57)	0.203*** (16.64)	0.203*** (10.52)	0.108*** (7.54)	0.346*** (23.63)	0.140*** (8.93)	0.232*** (17.60)	0.221*** (17.40)	0.171*** (10.03)
ADR	0.001 (0.02)	-0.076* (-1.68)	0.025 (0.73)	-0.128*** (-2.98)	0.229*** (6.11)	-0.245*** (-6.87)	-0.005 (-0.14)	-0.003 (-0.08)	0.072** (2.13)	-0.204*** (-4.84)
Return	-0.157*** (-45.48)	-0.096*** (-12.61)	-0.167*** (-46.10)	-0.095*** (-14.24)	-0.180*** (-44.36)	-0.091*** (-17.81)	-0.172*** (-38.78)	-0.148*** (-34.11)	-0.173*** (-44.67)	-0.115*** (-21.00)
STD	0.097*** (14.24)	0.076*** (5.43)	0.106*** (14.45)	0.061*** (5.30)	0.108*** (12.90)	0.076*** (8.53)	0.136*** (13.79)	0.084*** (10.58)	0.140*** (17.02)	-0.010 (-1.11)
Price	-0.096*** (-29.15)	-0.035*** (-6.14)	-0.094*** (-28.75)	-0.045*** (-8.11)	-0.093*** (-26.55)	-0.069*** (-14.62)	-0.081*** (-21.10)	-0.071*** (-18.10)	-0.109*** (-31.83)	-0.004 (-0.85)
IO	-0.779*** (-28.60)	-0.810*** (-11.39)	-0.786*** (-28.00)	-0.735*** (-12.23)	-0.650*** (-13.76)	-0.830*** (-26.12)	-0.692*** (-24.04)	-0.698*** (-13.55)	-0.757*** (-27.92)	-0.791*** (-12.49)
High-Low [p-value]	0.066 [<0.001]		0.027 [0.023]		0.014 [0.165]		0.004 [0.636]		0.009 [0.421]	
Fixed effects	CIY	CIY	CIY	CIY	CIY	CIY	CIY	CIY	CIY	CIY

(Continued)

Table 7. (Continued)

VARIABLES	Antsel		Disreq		Gtran		Adri_pv		Accsta	
	High (1)	Low (2)	High (3)	Low (4)	High (5)	Low (6)	High (7)	Low (8)	High (9)	Low (10)
Nobs	124,616	33,828	114,061	44,383	82,443	76,001	70,167	88,277	106,966	51,478
Adj. R2	83.3%	64.0%	82.5%	73.5%	79.3%	79.5%	85.4%	74.3%	83.9%	70.9%

This table reports the firm-level panel regression of analyst coverage on stock liquidity, and other firm-level institutional environments on the relation between analyst coverage and stock liquidity is incorporated by dividing the entire sample into sub-samples: high versus low institutional environment based on five alternative proxies that are the measures of the institutional environment at the country level: *Anstel*, *Disreq*, *Gtran*, *Adri_pv* and *Accsta*. The regression model is as follows:

$$Stockliquidity_{i,t} = \theta_0 + \theta_1 LnAn_{i,t-1} + Controls_{i,t-1} + \epsilon_{i,t} \quad (1)$$

where *Stockliquidity*_{*i,t*} denotes stock liquidity, which is measured by the percentage effective spread (*Iliq*). *LnAn*_{*i,t*} is a logarithm of one plus number of financial analysts covering a firm *i*. *Controls*_{*i,t*} is a set of firm *i*'s firm-specific control variables, including book-to-market ratio (*BM*), firm size (*MV*), closely held ownership (*CH*), annual stock returns (*Return*), stock return volatility (*STD*), stock price (*Price*), MSCI index (*MSCI*), U.S. cross-listing (*ADR*), and total institutional ownership of stock *i* (*IO*). All the independent variables are included in equation (1) with a one-year lag. Column (1), (3), (5), (7) and (9) report regression results with the high institutional environment while column (2), (4), (6), (8) and (10) report regression results with low institutional environment. *Nobs* is the number of observations. *Adj. R2* is the adjusted R² value. Country-fixed and year-fixed effects are included (not reported). The t-statistics shown in parentheses are based on standard errors that are adjusted for heteroscedasticity and firm-level clustering. Superscripts **, and *** denote the significance level of 10%, 5%, and 1%, respectively. The sample covers stocks across 41 countries, and the sample period is from 2000 to 2010 (from 1999 to 2009 for the lagged variables). Definitions of the variables are given in Appendix A.

Our results have important implications for firms and regulators. Firms can reduce the adverse effect of information asymmetry on their stock liquidity by increasing their analyst coverage. On the other hand, improving the quality of institutional infrastructure can partially offset the adverse effect of information asymmetry. Policy makers in poor institutional environments should make more efforts to regulate governance mechanism and improve information transparency.

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Author details

Tung Lam Dang¹

E-mail: dangtlam@due.edu.vn

E-mail: dangtlam@gmail.com

Nguyen Trang Phuong Doan¹

E-mail: phuongdnt@due.edu.vn

Thi Minh Hue Nguyen²

E-mail: huenm@neu.edu.vn

Thanh Thao Tran³

E-mail: thanhtaobanking@gmail.com

Xuan Vinh Vo^{3,4}

E-mail: vxvinh@yahoo.com

ORCID ID: <http://orcid.org/0000-0002-4725-6914>

¹ University of Economics, University of Da Nang, Da Nang, Vietnam.

² National Economics University, Hanoi, Vietnam.

³ Institute of Business Research, University of Economics, Ho Chi Minh City, Vietnam.

⁴ CFVG, University of Economics, Ho Chi Minh City, Vietnam.

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Appendix A. Variable definitions

Variables	Acronym	Description	Data sources
A. Firm-level variables			
(i) Liquidity measures			
Percentage effective spread	<i>Illiq</i>	Log of the average of daily percentage effective spread in a given year. We first calculate the intraday percentage effective spread as twice the absolute value of the difference between the trading price and the midpoint of the bid and ask price, divided by the midpoint of the bid and ask price. The daily percentage effective spread is then estimated as the dollar-volume weighted average of intraday spread measures in a given day.	TRTH
Amihud's (2002) illiquidity	<i>Amihud</i>	Log of the average of the daily Amihud (2002) illiquidity measure in a given year, in which the daily Amihud illiquidity measure is calculated as the absolute value of stock returns divided by the dollar trading volume on a given day.	Datastream
ii) Key independent variable			
Analyst coverage	<i>LnAna</i>	Log of one plus number of financial analysts covering a firm.	I/B/E/S
(iii) Other firm-level characteristics			
MSCI index	<i>MSCI</i>	An MSCI index member dummy that equals one if the firm is included in an MSCI country index.	Worldscope
Book-to-market ratio	<i>BM</i>	Log of book-to-market equity ratio.	Worldscope
Firm size	<i>MV</i>	Log of market capitalization denominated in US dollars.	Worldscope
Closely held ownership	<i>CH</i>	Fraction of shares closely held by insiders and controlling shareholders.	Worldscope
US cross-listing	<i>ADR</i>	An ADR dummy that equals one if the firm was cross-listed on a US exchange.	Worldscope
Annual stock returns	<i>Return</i>	Annual stock returns.	Datastream
Stock return volatility	<i>STD</i>	Annualized standard deviation of monthly stock returns.	Datastream
Stock price	<i>Price</i>	Log of stock price in US dollars.	Datastream
Total institutional ownership	<i>IO</i>	The total institutional ownership as the percentage of shares outstanding.	FactSet/ LionShares
B. Country-level variables			
Disclosure requirement index	<i>DisReq</i>	Average score of six disclosure 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 one is assigned to the index if it signifies high-quality disclosure and 0 otherwise.	

(Continued)

(Continued)

Variables	Acronym	Description	Data sources
Accounting standard index	<i>Accsta</i>	The index was created by examining and rating companies' 1990 annual reports on their inclusion or omission of 90 specific accounting items, covering general information, income statements, balance sheets, funds flow statements, accounting standards, stock data, and special items.	
Governance transparency index	<i>Gtran</i>	The index measures the extent of governance disclosure on shareholdings and remuneration of firms' insiders and major shareholders.	
Anti-self-dealing index	<i>AntSel</i>	The index focuses on a country's disclosure quality, approval, and litigation governing self-dealing transactions.	
Anti-director index	<i>Adri_pv</i>	The index captures the importance of shareholder protection. The anti-director index is from Pagano and Volpin (2005) for year 1993 to 2002. Before 1993 and after 2002, we assume the anti-director index constant over time.	



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