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Control-Ownership Wedge, Disclosure Incentives, and Stock Price Informativeness: International Evidence

ABSTRACT: Using a sample of firms with ultimate ownership data from 9 East Asian and 13 Western European countries, this study investigates whether the wedge between voting rights (control) and cash flow rights (ownership) influences a firm's information environment, in particular, the extent to which firm-specific information is incorporated into stock prices which we conveniently call stock price informativeness (SPI). We find that SPI decreases with the control-ownership wedge, and that the SPI-reducing effect of the wedge is attenuated for firms with high analyst following and in countries with strong institutions. Finally, we also find that SPI decreases with analyst following, but this SPI-reducing effect of analyst coverage is attenuated in countries with strong institutions. This finding suggests that strong institutional environments are conducive to analysts producing and disseminating more firm-specific information relative to common (market-wide and/or industry-wide) information.

Keywords: Ownership structure; Disclosure incentives; Analysts; Institutions; Information flow; Stock price informativeness.

Control-Ownership Wedge, Disclosure Incentives, and Stock Price Informativeness: International Evidence

1. Introduction

Using a sample of non-U.S. firms from 22 countries in East Asia and Western Europe, this study investigates the relation between corporate ownership structure and the flow of firm-specific information to the market in an international context. In particular, our analysis focuses on whether and how the divergence between voting rights (control) and cash flow rights (ownership) influences the extent to which firm-specific information is incorporated into stock prices via its impact on controlling shareholders' incentives to disclose or withhold firm-specific information.

An important stream of recent research in financial economics examines both country-level and firm-level determinants of the amount of firm-specific information incorporated into stock prices, using a measure of stock price non-synchronicity or firm-specific return variation, which we call *stock price informativeness*. Higher stock price non-synchronicity means that stock prices covary with firm-specific factors to a greater extent than common (market-wide or industry-wide) factors. Similarly, higher firm-specific return variation indicates that stock prices incorporate a greater amount of firm-specific information, thus making stock prices more informative (Durnev et al. [2003], Jin and Myers [2006], Piotroski and Roulstone [2004], Kim and Yi [2008]).

Morck et al. [2000] examine stock price synchronicity at the country level around the world. They find that that stock price movements are less synchronous in developed markets with relatively strong property rights protection (and thus fewer impediments to informed trading) than in emerging markets with relatively poor protection. Their cross-

country evidence suggests that stock price synchronicity at the country level is inversely associated with the intensity of private information-based trading. Jin and Myers [2006] show that stock price synchronicity is inversely associated with a country's accounting transparency. While the above studies are concerned with country-level determinants of stock price informativeness (SPI), recent studies by Ferreira and Laux [2007], Fernandes and Ferreira [2008] and Kim and Shi [2008] focus on its firm-level determinants, and report that SPI is positively associated with the openness to external takeover threats, cross listing, and voluntary commitment to enhanced disclosures, respectively. In particular, Ferreira and Laux point out that SPI, which is an inverse measure of stock price synchronicity, is "a good candidate for a summary measure of information flow, especially for private information about firms" (p.952). Overall, the aforementioned studies provide evidence suggesting that the strength of both firm-level and country-level governance mechanisms is an important determinant of the amount of firm-specific information reflected in observed stock prices.

However, previous SPI research has paid little attention to the role of ownership structure in facilitating or deterring the flow of firm-specific information to the market, although the ownership structure is known to be a crucial factor influencing insiders' incentives to withhold firm-specific information for their private control benefits (e.g., Fan and Wong [2002], Lang et al. [2004], Haw et al. [2004], Kim and Yi [2006], Baik et al. [2007]). To fill this void, we investigate the role of corporate ownership structure in determining SPI or the extent to which stock prices reflect firm-specific information. In so doing, our analysis focuses on an important aspect of corporate ownership in many non-U.S. countries around the world, which is the detachment of voting rights from cash

flows rights. This control-ownership detachment is not only prevalent, but it is also a major source of agency problems, in most non-U.S. countries around the world (Shleifer and Vishny [1997], La Porta et al. [1999]). In particular, in East Asia and Western Europe, a relatively small number of controlling shareholders such as members of founding families typically exercise nearly full control over many public firms via complicated ownership structures (e.g., multiple-class shares, ownership pyramids and cross shareholdings), albeit they possess relatively low cash flow rights (e.g., Claessens et al. [2000], Faccio and Lang [2002], Joh [2003], Kim and Yi [2006]).

Control rights in excess of ownership rights (hereafter, the wedge) create the conflict of interest between controlling shareholders and outside minority shareholders, and provide the latter with incentives, abilities, opportunities, and means to divert firm resources for their private gains at the expense of minority shareholders (e.g., Johnson et al. [2000], Bertland et al. [2002], Haw et al. [2004], Kim and Yi [2006]). As the wedge widens, expected private control benefits increase and the associated costs decrease (Fan and Wong [2002]). As a result, controlling shareholders have stronger incentives to extract private control benefits. This motivates controlling shareholders to withhold (or selectively disclose) value-relevant, firm-specific information to outside shareholders in an attempt to conceal the valuation implication of their self-serving behaviors. We therefore argue that the wedge adversely affects the flow of firm-specific information to outside investors, thereby making observed stock prices less informative.

To provide systematic evidence on the above issues, we first test whether the wedge is inversely associated with SPI. For our empirical tests, we construct a sample of non-U.S. firms with ultimate ownership data from 22 countries in East Asia and Western

Europe. Consistent with our expectation, the results using a total of 13,542 firm-years over the 1994-1999 period show that SPI is significantly lower for high-wedge firms than for low-wedge firms even after controlling for other firm-specific factors that are known to influence SPI. This finding is consistent with the view that agency problems arising from the wedge motivate controlling shareholders to manipulate the flow of firm-specific information to outside minority shareholders by withholding (or selectively disclosing) value-relevant, firm-specific information.

Second, we predict that the SPI-reducing effect of the wedge is stronger in countries with poor institutions than in countries with strong institutions. In institutional environments where the interests of outside minority shareholders are well protected, controlling shareholders are less able to extract private control benefits and thus have fewer incentives to hide the true performance by withholding firm-specific information. Consistent with our prediction, our regression results show that the wedge effect on impeding the information flow (and thus reducing SPI) is significantly greater (less) in countries with poor (strong) institutions. This finding suggests that strong institutional infrastructures help improve a firm's information environment by ameliorating potential agency problems associated with poor firm-level governance (i.e., the wedge), and thus facilitating disclosure transparency. Our result is consistent with the view that country-level and firm-level governance mechanisms interact with each other, and they are substitutes for each other rather than complements (Doidge et al. [2008], Leuz et al. [2008]).

Third, we examine whether the SPI-reducing effect of the wedge is stronger for firms with high analyst following than for firms with low analyst following. To the extent

that analysts play a role in monitoring and deterring managerial opportunism, agency problems associated with the wedge could be alleviated (Jensen and Meckling [1976], Healy et al. [2001], Ball [2001]). One can therefore expect that the inverse relation between the wedge and SPI is weaker for firms with high analyst coverage than for firms with low coverage. Consistent with our expectation, we find that the negative wedge effect on SPI is inversely associated with the intensity of analysts' activities proxied by the number of analysts following a firm.

Finally, we investigate whether the role of analysts in influencing stock price informativeness is conditioned upon the strength of a country's institutional environment. We find that, while analysts in general play a role of facilitating the flow of common information to the market, and thus their coverage is inversely associated with SPI, their role differs systematically, depending on a country's institutional environment. Specifically, our evidence shows that the negative relation between SPI and analyst following, which is well documented in the U.S. market (e.g., Piotroski and Roulstone [2004]) and other markets (e.g., Chan and Hameed [2006]), is either significantly attenuated in countries with strong institutions, compared with the same relation in countries with poor institutions. This finding suggests that analysts engage relatively more in the acquisition and dissemination of *firm-specific* information in countries with strong institutions while they engage relatively more in the production of *common* (market-wide or industry-wide) information in countries with poor institutions. As a result, analyst coverage is more related to the firm-specific information flow in countries with relatively strong institutions, while it is more related to the common information flow in countries with relatively poor institutions.

Our study contributes to the extant literature in the following ways. To our knowledge, this is the first study to provide systematic evidence on an inverse relation between control-ownership wedge and SPI. We find the control-ownership wedge is a key determinant of the flow of firm-specific information, even after controlling for all other factors known to affect a firm's information environment. Second, our study sheds light on puzzling evidence that SPI is inversely associated with analyst following (e.g., Piotroski and Roulstone [2004], Chan and Hameed [2006], Fernandes and Ferreira [2008]). We provide international evidence that this inverse association is attenuated in countries with strong institutions. Our evidence suggests that strong (poor) institutional environments are conducive to the costly acquisition of firm-specific information and its dissemination by analysts, which in turn facilitates the incorporation of more firm-specific information, relative to common information, into stock prices. Finally, evidence reported in this study provides useful insight into the ongoing debate over whether firm-level and country-level governance mechanisms are substitutes or complements to each other (e.g., Doidge et al. [2004], Durnev and Kim [2005], Burgstahler et al. [2006]). We find that firm-level agency problems arising from the wedge are ameliorated in an environment where external monitoring by analysts is effective and a country's institutions are strong. This finding is in line with the substitution perspective on the role of firm-level and country-level governance mechanisms in shaping a firm's information environment.

The remainder of this paper proceeds as follows. In section 2, we review previous studies that are related to the tenor of our study, and develop our research hypotheses. Section 3 describes the sample and data sources, and explains how we measure our key

research variables, stock price informativeness and control-ownership wedge. In section 4, we specify empirical models used for hypothesis testing. Section 5 presents descriptive statistics, along with the results of univariate tests. Section 6 reports the results of multivariate tests for our hypotheses. The final section concludes the paper.

2. Extant Research and Hypothesis Development

2.1. Control-ownership divergence, disclosure incentives, and information flows

As mentioned earlier, the control-ownership wedge is a common characteristic of corporate ownership structure in most non-U.S. countries around the world, and it is a major source of agency problems (La Porta et al. [1999], Claessens et al. [2000], Faccio and Lang [2002], Lins [2003]). The wedge allows controlling shareholders to exercise nearly full control over major corporate decisions, including disclosure policies, while maintaining low cash flow rights relative to voting rights. This creates incentives and opportunities for controlling shareholders to extract private control benefits or to 'tunnel' corporate resources for their private gains, because in the presence of wedge, expected control benefits are likely to be greater than the associated costs (e.g., Johnson et al. [2000], Fan and Wong [2002]). Further, concentrated control power allows them to be less subject to external disciplinary forces such as the market for corporate control, which in turn facilitates controlling shareholders being entrenched.

In this situation, controlling shareholders, who engage actively in extracting private control benefits, are likely to have incentives to hide their rent-seeking activities by withholding unfavorable information, selectively disclosing such information that helps them camouflage their self-serving behaviors, and/or opportunistically timing the

release of value-relevant information to outside minority investors. In other words, concentrated control power arising from the wedge allows entrenched controlling shareholders to control corporate disclosures for their private gains at the expenses of minority shareholders, thereby influencing the flow of firm-specific information to outside minority shareholders. There is another reason why entrenched controlling shareholders prefer to control the information flow: insofar as control power is concentrated with controlling shareholders with specialized knowledge, expertise or skill, they have incentives to protect their human capital by adopting selective disclosures or by controlling the flow of their proprietary information to outside stakeholders such as analysts and minority shareholders (Fan and Wong [2002]). One can therefore expect that the amount of firm-specific information incorporated into stock prices is lower for high-wedge firms than for low-wedge firms. To provide empirical evidence on this unexplored issue, we hypothesize in alternative form:

> **H1:** *The control-ownership wedge is inversely associated with stock price informativeness, all else being equal.*

2.2. Does institutional infrastructure matter?

We further examine whether the strength of a country's institutional infrastructure matters in determining the hypothesized, inverse relation between the wedge and price informativeness. A growing body of research predicts and finds that country-level and firm-level governance mechanisms act as a *substitute* for each other. A major argument here is that strong country-level governance significantly ameliorates potential agency problems associated with poor firm-level governance such as control-ownership wedge, and thus, that the effect of country-level (firm-level) governance is of first-order (second-

order) importance (e.g. Dyck and Zingales [2004], Doidge et al. [2008]). For example, Leuz et al. [2008] investigate whether country-level and firm-level governance mechanisms matter to U.S. investors' decision to invest in foreign stocks. They provide evidence that firm-level governance is less important in foreign equity investment by U.S. investors when stocks concerned are from countries with strong institutions.

In this *substitution* scenario, the wedge-related agency problems at the firm level are likely to be attenuated in countries with strong institutions, while the problems would be exacerbated in countries with poor institutions. We therefore predict that the SPI-reducing effect of the wedge is less severe in countries with strong institutions than in countries with weak institutions. To provide empirical evidence on the above prediction, we hypothesize in alternative form:

> **H2:** *The inverse relation between control-ownership wedge and stock price informativeness is stronger in countries with poor institutions than in countries with strong institutions, all else being equal.*

2.3. Does analyst following matter?

Analysts play the roles of not only information intermediation between corporate insiders and outside investors but also monitoring managerial performance (Jensen and Meckling [1976], Ball [2001]). Effective monitoring by analysts improves firm performance by constraining agency problems associated with the control-ownership wedge (e.g., Lang et al. [2004]). The improved performance is likely to motivate controlling shareholders to voluntarily disclose the true underlying performance in an accurate and timely manner. One can therefore expect that effective monitoring by analysts is associated with more transparent financial reporting. In particular, we predict that the SPI-reducing effect of the wedge is attenuated when external monitoring by

analysts is relatively strong (i.e., for firms with high analyst following) than when it is relatively weak (i.e., for firms with low analyst following). To provide evidence on this unexplored issue, we test the following hypothesis in alternative form.

> **H3:** *The inverse relation between control-ownership wedge and stock price informativeness is weaker for firms with high analyst following than for firms with low analyst following, all else being equal.*

Previous research provides evidence that firm-specific return variation is lower for firms with high analyst following than for firms with low analysts following in the U.S. market (Piotroski and Roulstone [2004]), in the emerging market (Chan and Hameed [2006]), and around the world (Fernades and Ferreira [2008], Kim and Shi [2008]). This evidence suggests that analysts are involved primarily in the production and dissemination of industry-wide and/or market-wide information rather than the costly acquisition of private information that is idiosyncratic to corporate insiders such as controlling shareholders. As a result, high analyst coverage facilitates intra-industry information transfers, leading to stock prices incorporating more common information relative to firm-specific information, or equivalently, contributing to less informative or more synchronous stock prices (Piotrsoki and Roulstone [2004]). To our knowledge, however, no previous research has investigated whether and how the strength of a country's institutional infrastructures influences the inverse relation between analyst following and SPI. As a result, little is known about whether the role of analyst coverage in determining SPI differs systematically between countries with strong and weak institutions. Given the lack of theory and evidence on the above issue, we test the following hypothesis with no directional prediction:

H4: *The inverse relation between analyst following and stock price informativeness differs, depending on the strength of a country's institutions, all else being equal.*

3. Data and Measurement of Key Research Variables

In this section, we first explain the sample and data sources. We then describe the measurement of the dependent variable, i.e., stock price informativeness, and a key test variable, i.e., control-ownership wedge.

3.1. Sample and data sources

The initial list of our sample consists of all firms that have data on the control and ownership structures of the largest ultimate owner from two sources: Claessens et al. [2000] and Faccio and Lang [2002]. Claessens et al. provide the ultimate ownership data for 2,998 listed companies in 9 East Asian countries as of 1996 (Hong Kong, Indonesia, Japan, Korea, Malaysia, the Philippines, Singapore, Taiwan, and Thailand), while Faccio and Lang provide the same data for 5,232 listed companies in 13 Western European countries (Austria, Belgium, Finland, France, Germany, Ireland, Italy, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom) for the period, 1996-1999.

Our sample period covers the 6-year period, 1994-1999 for both East Asian and West European firms. As we do not have the ultimate ownership data for 1994-1995 and 1997-1999 for East Asian firms and for 1994-1993 for Western European firms, we assume that the ultimate ownership structure for these years remained the same as in 1996.[1] In an attempt to maintain homogeneous interpretations of financial statement

[1] This approach is the same with that of Haw et al. [2004] who use the same set of wedge data with ours, and assume that the wedge remains the same over their 10-year sample period, 1990-1999. Though not reported, we also estimate our regressions using a reduced sample which excludes 1997-1999 observations for East Asian countries to check whether our reported results are unduly influenced by the 1997-1998

variables across sample firms, we exclude firms in the financial service industry from our sample, though they are included in the databases constructed by Claessens et al. and Faccio and Lang. We then require that all financial data used for our study be available from *Worldscope*, and that weekly stock return and trading data be available for at least 30 weeks in each year from *Data Stream*. We also require that information about analyst following be available from *IBES International*. After applying the above selection criteria, we obtain a final sample of 13,542 firm-years (3,009 firms in total) for 9 East Asian and 13 Western European countries. Table 1 provides the distribution of our sample firms by country and year.

[INSERT TABLE 1 ABOUT HERE!]

3.2. Measurement of stock price informativeness

Our dependent variable is stock price informativeness (SPI) which captures the amount of firm-specific information incorporated in stock prices. Similar to previous research (e.g., Piotroski and Roulstone [2004], Chan and Hameed [2006], Fernandes and Ferreira [2008]), we measure SPI using the R^2 statistics for the market model. Specifically, we estimate the following model using weekly return data for each stock and in each year:

$$r_{i,t} = \alpha_{\mathrm{i}} + \beta_{i,t} r_{m,j,t} + \gamma (r_{US,t} + e_{j,t}) + \varepsilon_{\mathrm{i,t}} \quad (1)$$

where, for stock *i* and year *t*, $r_{i,t}$ refers to weekly return; $r_{m,j,t}$ represents value-weighted domestic, weekly market index return in country *j*; $r_{US,t}$ is value-weighted U.S. weekly market index return (a proxy for the global market factor); $e_{j,t}$ denotes the weekly

Asian financial crisis. Unreported results show, however that our regression results reported in the paper are, overall, qualitatively similar to those using the reduced sample.

change in country *j*'s exchange rate per U.S. dollar; and ε_{it} represents unspecified factors. The expression $r_{US,t} + e_{j,t}$ translates U.S. stock market returns into local currency unites.

In estimating Eq. (1), we exclude stocks that trade for less than 30 weeks during a year. For each sample year, we compute the relative firm-specific return variation for each stock using the ratio of firm-specific return variation ($\sigma_{i\varepsilon}^2$) to total return variation (σ_i^2), i.e., $\sigma_{i\varepsilon}^2 / \sigma_i^2$. Note here that $1 - R_i^2$ of Eq. (1) is equal to this ratio, while R^2 of Eq. (1) is equal to $(\sigma_i^2 - \sigma_{i\varepsilon}^2)/\sigma_i^2$. We then obtain stock price informativeness, denoted by *SPI,* for firm *i* in each year *t* as below:

$$SPI_{i,t} = \ln\left(\frac{1 - R_{i,t}^{\ 2}}{R_{i,t}^{\ 2}}\right) = \ln\left(\frac{\sigma_{ie}^{\ 2}}{\sigma_i^{\ 2} - \sigma_{ie}^{\ 2}}\right) \quad (2)$$

The logistic transformation is applied to circumvent the bounded nature of R_{it}^2 within [0, 1]. As shown in Eq. (2), *SPI* captures firm-specific return variation relative to common (market-wide and industry-wide) variation which equals total variation net of firm-specific variation.

3.3. Measurement of control-ownership wedge

A key test variable in this paper is the extent to which voting rights are detached from cash flow rights, which we call control-ownership wedge. We measure the wedge using the ratio of voting rights of the largest ultimate owner (V) to his or her cash flow rights (C), namely V/C. As the control-ownership wedge increases, the ultimate controlling shareholder has more incentives and greater abilities to exploit corporate wealth for his or her private gains at the expense of minority shareholders. As in Claessens et al. [2000] and Faccio and Lang [2002], the ultimate owner is defined as the

shareholder who holds at least 5% of the voting rights of the firm and who is not controlled by anybody else. Following Fan and Wong [2002] and Haw et al. [2004], we set the ultimate owner's voting rights not to exceed 50% because his or her control power does not increase further in the range of more than 50% voting rights. Our analysis focuses on the largest ultimate shareholder although there might be multiple ultimate shareholders in a firm. The cash flow rights of the ultimate shareholder equal the sum of the ownership stakes of affiliated firms from each control chain identified. As will be further explained later, we also consider the ultimate owner's cash flow rights in our baseline regressions to control for the degree of interest alignment between controlling and minority shareholders.

4. Empirical Specification

Our first two hypotheses are concerned with whether *SPI* is inversely related to the wedge (H1) and whether the *Wedge-SPI* relation is conditioned on the strength of a country's institutional infrastructure (H2). To test H1 and H2, we posit the following regression:

$$\begin{aligned} SPI = {} & \alpha_0 + \alpha_1 Wedge + \alpha_2 Institution + \alpha_3 Wedge * Institution \\ & \sum_k \alpha_k Firm - specificControls_k + (YearDummies) + (IndustryDummies) \\ & + (CountryDummies) + error \end{aligned}$$

(3)

where *SPI* denotes our measure of stock price informativeness as defined in Eq. (2); *Wedge* represents the ratio of voting rights (V) of the largest ultimate owner to his or her

cash flow rights (C), i.e., V/C;[2] *Institution* denotes our proxies for the strength of a country's institutional infrastructure, which are: (1) the good government index and (2) the investor protection index as defined in Appendix A. To isolate the effect of our test variables on *SPI* from the effect of other variables that are known to influence *SPI,* we include in our regression a total of 8 firm-specific control variables, that is: firm size measured by the natural log of market capitalization (*MKTCAP*); market-to-book ratio (*MB*); the ratio of long-term debt to book value of equity (*LEV*); the ratio of absolute total accruals to absolute cash flows (*ACCR*); earnings volatility measured by the standard deviation of return on assets over past five years (*STDROA*); trading volume measured by the number of shares traded divided by the number of shares outstanding (*VOL*); the indicator variables for the presence of losses and cross listings (*LOSS* and *CROSS*, respectively). *Year Dummies, Industry Dummies* and *Country Dummies* are included to control for year, industry, and country fixed effects, respectively. Appendix A provides detailed definitions of all the variables included in our regressions. Hypothesis H1 translates as $\alpha_1 < 0$, while H2 is supported if $\alpha_3 > 0$, along with $\alpha_1 < 0$ and $\alpha_2 > 0$.

Hypothesis H3 is concerned with whether *Wedge-SPI* relation is conditioned on analyst coverage, denoted by *NAF*, while H4 is concerned with whether the *NAF-SPI* relation is conditioned on the strength of a country's institutions, denoted by *Institution*. To test H3 and H4, we estimate the following regression:

[2] For empirical tests, we have also used: (1) the wedge (V-C) relative to voting rights (V), i.e., 1 – C/V; (2) the absolute wedge (V – C); and (3) the wedge relative to cash flow rights, i.e., 1-V/C. We find that the results using these alternative measures of Wedge are qualitatively similar to those reported in the paper. For brevity, we therefore report only the results using the ratio of voting rights to cash flow rights as the wedge measure.

$$
\begin{aligned}
SPI = {} & \alpha_0 + \alpha_1 Wedge + \alpha_2 Institution + \alpha_3 NAF + \alpha_4 Wedge * Institution \\
& + \alpha_5 Wedge * NAF + \alpha_6 NAF * Institution + \alpha_7 Wedge * NAF * Institution \\
& \sum_k \alpha_k Firm - specificControls_k + (YearDummies) + (IndustryDummies) \\
& + (CountryDummies) + error
\end{aligned}
\tag{4}
$$

where *NAF* represents the number of analysts following a firm, and all other variables are as defined earlier. Appendix A provides the exact definitions of all variables included in Eq. (4). Note here that hypothesis H3 translates as $\alpha_5 > 0$, along with $\alpha_1 < 0$, while H4 is supported if α_5 is significantly different from zero. We include the *Wedge*NAF*Institution* variable to control for potential three-way interactions among the wedge, the intensity of analyst activities, and the strength of a country's institutions. In Eq. (4), we use the same set of control variables included in Eq. (3).

5. Descriptive Statistics and Univariate Tests

Table 2 presents descriptive statistics for our test and control variables. As shown in Panel A of Table 2, the mean values of voting rights and cash flow rights are about 24.40% and 20.54%, respectively, suggesting that ownership are highly concentrated with the largest ultimate shareholder. The mean wedge ratio (V/C) is about 1.78, indicating that voting rights held by the largest ultimate owner is significantly greater than cash flow rights. As shown in Panel B of the table, the mean and median of *SPI* are 2.12 and 1.97, respectively, with a relatively large standard deviation of 1.29, suggesting that *SPI* is reasonably distributed with a wide variation across firms. The mean *SPI* of 2.12 for our international sample is smaller that the mean of 2.731 for the U.S. sample of Ferreira and Laux [2007]. This indicates that that stock prices are less informative for non-U.S. firms in our sample than for U.S. firms.

As reported in Panel C of the table, on average, our sample firms are followed by about 10 analysts. The mean and median of *MKTCAP* are 11.59 and 11.84, respectively, suggesting that our sample includes relatively large firms. On average, long term debts for our sample firms amount to about 57% of book equity. The mean earnings volatility, i.e., *STDROA*, differs significantly from its median, and has a relatively large standard deviation, suggesting that its distribution is skewed. The magnitude of absolute (unsigned) accruals is about 139% of (absolute) cash flows from operations. On average, about 103% of shares outstanding were traded during the sample period. During our sample period, about 20% of our sample firms experienced a loss, while about 1.3% of them were cross-listed in other countries.

Panel D of Table 2 provides univariate tests for differences in *SPI* and *NAF* between zero-wedge firms and positive-wedge firms. We find that the mean and median of *SPI* are significantly higher for the zero-wedge subsample (*Wedge* = 1) compared with the positive-wedge subsample (*Wedge* > 1). However, the mean analyst following of the zero-wedge subsample is not significantly different from that of the positive-wedge subsample.

[INSERT TABLE 2 ABOUT HERE!]

Table 3 presents the Pearson correlation matrix. With respect to the correlation structure reported in Table 3, the following are noteworthy. First, *SPI* is significantly negatively correlated with the wedge, which is consistent with hypothesis H1. Second, we find that *SPI* is significantly positively correlated with cash flow rights, which is consistent with the notion that as cash flow rights held by the largest ultimate owner increase, agency problems decrease and more information is incorporated into stock

prices. Finally, we find a negative correlation between *SPI* and *NAF*, suggesting that the intensity of analyst activities is associated with intra-industry information transfer, which in turn leads to stock prices incorporating more common information relative to firm-specific information.

[INSERT TABLE 3 ABOUT HERE!]

6. Results of Multivariate Regressions

6.1. Results of baseline regressions: Tests of H1

To establish a baseline relation between the wedge and *SPI*, we first estimate Eq. (3) without including the two institution-related variables, i.e., *Institution* and *Wedge*Institution*, and report the estimated results in column 1 of Table 4. Throughout the paper, to alleviate a concern about potential serial correlation in the data, we report *p*-values that are adjusted using robust standard errors corrected for clustering at the firm level. As shown in column 1, the coefficient on *Wedge* is highly significant with $p < 0.00$ even after controlling for other firm-specific variables that are known to influence *SPI* as well as year, industry, and country fixed effects. This result strongly supports our first hypothesis, H1, and is consistent with the following view: as the wedge increases, controlling shareholders become more entrenched, and are more likely to engage in extracting private control benefits. To hide their 'tunneling' activities, entrenched controlling shareholders are likely to manipulate the flow of firm-specific information to outside minority shareholders by withholding or selectively disclosing value-relevant information that is idiosyncratic to them. As a result, stock prices incorporate less firm-

specific information relative to common (market-wide or industry-wide) information, which in turn decreases stock price informativeness.

One can expect that as the cash flow rights increase, the interest of controlling shareholders are increasingly aligned with the interest of outside minority shareholders. As a result, controlling shareholders are less likely to intervene in the flow of firm-specific information to minority shareholders, which leads to stock prices incorporating more firm-specific information relative to common information. To examine this issue, we estimate our base line regression after replacing *Wedge* by cash flow rights of the largest ultimate owner, and report the results in column 2 of Table 4. Consistent with our expectation, we find that the coefficient on *Cash Flow Rights* is significantly positive.

Column 3 of the same table reports the results of our baseline regression with both *Wedge* and *Cash Flow Rights* included. As shown in column 3, the coefficients on *Wedge* and *Cash Flow Rights* are both highly significant with expected negative and positive signs, respectively. The results of our baseline regressions reported in Table 4, taken together, indicate that the wedge plays a different role from cash flow rights. Put differently, our results suggest that the *Wedge* variable effectively captures the extent of agency problems associated with controlling shareholders' entrenchment, while the *Cash Flow Rights* variable proxies for the extent of incentive alignment between controlling and minority shareholders.

With respect to control variables, our results are, overall, in line with the findings of previous research. Consistent with U.S. evidence reported in Ferreira and Laux [2007] and international evidence reported in Fernandes and Ferreira [2008] and Kim and Shi [2008], we find that the coefficient on *MKTCAP* is significantly negative at the 1% level.

We find that the coefficients on *STDROA*, *MB* and *CROSS* are significantly positive across all columns and *LOSS* is significant with a negative sign, while the coefficients on *ACCR*, *LEV* and *VOL* are insignificant across all columns. These results are, overall, in line with evidence reported in previous studies.

[INSERT TABLE 4 ABOUT HERE!]

6.2. Role of institutional infrastructure: Tests of H2

To test for the role of institutional infrastructure in determining the *Wedge-SPI* relation (H1), we estimate Eq. (4) and report the estimated results in Table 5. Columns 1 and 2 of the table report the results using the good government index (*GoodGov*) and the investor protection index (*InvPro*), respectively, as a proxy for the strength of institutional infrastructure, i.e., *Institution.* As explained in Appendix A in details, the good government index is created by summing up three scores from La Porta et al. [1998] on corruption in the government, risk of expropriation of private property by the government, and risk of the government repudiating contracts. The investor protection index is created by combining three scores which capture a country's investor protection environment. Both indices are measured in such a way that higher (lower) values indicate a stronger (weaker) institutional infrastructure. While Eq. (4) includes a country-level variable, i.e., *Institution,* we continue to include *Country Dummies* in order to control for possible cross-country variations in other country-specific factor[3] that are not captured by *Institution*.

[3] These other country-specific factors include the level and growth rate of GDP, unemployment rate, tax compliance, IT communication infrastructure, media efficiency, and culture and region. Rather than including into our regressions these factors that are often highly correlated with the *Institution* variable, we control for them by including country dummies.

As shown in Panel A of Table 5, the coefficient on *Wedge* is highly significant with an expected negative sign, irrespective of which proxy for *Institution* is used. In other words, our main results reported in Table 4 remain unchanged after controlling for cross-country variation in the strength of a country's institutions. This further supports H1. We find that the coefficient on *Institution* is highly significant with an expected positive sign in both columns 1 and 2. This indicates that stock prices incorporate more firm-specific information relative to common information in countries with strong institutions than in countries with weak institutions, which is consistent with previous research (Fernandes and Ferreira [2008], Kim and Shi [2008]). Further, the positive relation between *SPI* and *Institution* is also consistent with existing cross-country evidence on the inverse relation between country-level stock price synchronicity and country-level governance such as property right protection and accounting transparency (Morck et al. [2000], Jin and Myers [2006]).

More importantly, we find that the coefficient on the interaction term, *Wedge*Institution*, is significantly positive (p = 0.01 and p = 0.09, respectively), irrespective of whether *GoodGov* or *InvPro* is used as a proxy for *Institution*. This is consistent with our second hypothesis, H2, suggesting that SPI-reducing effect of the wedge is attenuated (accentuated) in countries with strong (weak) institutions. Our results reported in Table 5 support the view that effective country-level governance mitigates potential agency problems associated with poor firm-level governance such as the control-ownership wedge, and facilitates firm-specific information capitalization into stock prices.

[INSERT TABLE 5 ABOUT HERE!]

6.3. Role of Analysts: Tests of H3 and H4

Table 6 reports the regression results for Eq. (4). To see if the inverse relation between *Wedge* and *SPI* in our baseline regressions in Table 4 is conditioned on the intensity of analyst activities, we first estimate a reduced model of Eq. (1) in which the three institution-related variables (i.e., *Institution, Wedge*Institution,* and *Wedge*NAF*Institution*) are excluded. The results are reported in column 1 of the table. As shown in column 1, the coefficient on *Wedge* is significantly negative ($p < 0.00$), which is consistent with H1. The coefficient on *NAF* is significantly negative as well ($p < 0.00$), which is consistent with evidence reported for the U.S. market (Piotroski and Roulstone [2004], Ferreira and Laux [2007]), for emerging markets (Chan and Hameed [2006]), and for international markets (Fernandes and Ferreira [2008], Kim and Shi [2008]). The significantly negative coefficient on *NAF* suggests that analysts facilitate intra-industry information transfers which contribute to stock prices incorporating more common information relative to firm-specific information (Piotroski and Roulstone [2004]).

More importantly, we find that the coefficient on the interaction term, *Wedge*NAF*, is significantly positive ($p = 0.07$ in a two-tailed test). This positive coefficient, along with the negative coefficient on *Wedge*, is consistent with our third hypothesis, H3. This finding can be interpreted as follows: analysts play a role of external monitoring, which limits the ability of controlling shareholders to withhold or selectively disclose value-relevant, firm-specific information for their private gains, and thus enhances the credibility of firm-specific information that controlling shareholders convey to the market. As a result, more firm-specific information (relative to common

information) is incorporated into stock prices, and the SPI-reducing effect of the wedge thus becomes attenuated for firms with high analyst coverage than for firms with low coverage.

While hypothesis H3 focuses on whether the SPI-reducing effect of the wedge is conditioned on the extent of analyst coverage, the primary concern of H4 is whether or not the SPI-reducing effect of analyst coverage is conditioned on the strength of a country's institutions. To test H4, we estimate a reduced model of Eq. (4) in which the three wedge-related variables (i.e., *Wedge*, *Wedge*NAF*, and *Wedge*NAF*Institution*) are omitted. Columns 2 and 3 report the estimated results using *GoodGov* and *InvPro*, respectively, as a proxy for *Institution*. We find that, similar to the results reported in column 1, the coefficient on *NAF* is significantly negative in columns 2 and 3 as well ($p < 0.00$), a finding consistent with previous research mentioned earlier. We also find that the coefficient on *Institution* is significantly positive in both columns ($p < 0.00$), which is consistent with the results reported in Table 5.

More importantly, we find the coefficient on the interaction term, *NAF*Institution*, is significantly positive in both columns 2 and 3 ($p = 0.01$ and $p < 0.00$, respectively). The significantly positive coefficient on *NAF*Institution*, along with the significantly negative coefficient on *NAF*, can be interpreted as follows. While analysts are involved primarily in the production and dissemination of common information (relative to firm-specific information), they also play a role of facilitating the incorporation of firm-specific information into stock prices. Their (firm-specific) information-facilitating role is more pronounced in countries with strong institutions than in countries with weak institutions. In short, our results are consistent with the view that analysts engage more

intensely in the costly acquisition and dissemination of firm-specific information in countries with strong institutions (which contributes to more informative prices), while they engage more intensely in the production and dissemination of common information in countries with poor institutions (which contributes to less informative prices).

Columns 4 and 5 of Table 6 report the results of the full model in Eq. (4) using *GoodGov* and *InvPro*, respectively, as a proxy for *Institution*. As shown in both columns, the coefficients on *Wedge* and *Wedge*Institutions* are highly significant with expected negative and positive sign, respectively, even after controlling for additional analyst-related variables (i.e., *NAF, Wedge*NAF, NAF*Institution,* and *Wedge*NAF*Institution*) which are not controlled in our baseline regressions reported in Tables 4 and 5. These findings buttress our earlier results for testing hypotheses H1 and H2.

Moreover, we find that in both columns 4 and 5 of Table 6, the coefficients on *NAF* and *Wedge*NAF* are highly significant with expected negative and positive signs, respectively, even after controlling for additional institution-related variables (i.e., *Institution, Wedge*Institution*, and *NAF*Institution* and *Wedge*NAF*Institution*) that are not controlled in the regression reported in column 1 of the same table. This corroborates our earlier test results on H3 reported in column 1. Further, we find that in both columns 4 and 5, the coefficients on *NAF* and *NAF*Institution* are highly significant with expected negative and positive signs, respectively, even after controlling for additional wedge-related variables (i.e., *Wedge, Wedge*NAF, NAF*Institution, Wedge*NAF*Institution*) that are not controlled in the regressions reported in columns 2 and 3. This finding lends further support for the earlier results reported in columns 3 and 4.

[INSERT TABLE 6 ABOUT HERE!]

6.4. Robustness checks

We re-estimate all regressions using the weighted least square (WLS) procedure to check whether our results are unduly influenced by the unequal size of country samples across different countries. As shown in Table 1, the number of observations for each country varies from 3,991 for Japan to 196 for Philippines for our East Asian sample and from 2,234 for UK to 10 for Ireland for our Western European sample. The results of our OLS regressions presented in Tables 4 to 6 could thus be affected by a large number of sample firms from a few countries such as Japan and UK. To address this issue, we re-estimate all our regressions using two different weighting schemes: (1) [1/the number of observation in each country] x the number of countries in our sample (which is 22); and (2) an equal weight assigned to each country. Because the results for all regressions under the two weighting schemes are qualitatively identical, for brevity, column 1 and 2 of Table 7 report only the results for the full-model regression in Eq. (4) under the first weighting scheme. As shown in column 1 and 2, the WLS results are qualitatively identical to the corresponding OLS results that are reported in columns 4 and 5 of Table 6. This suggests that our OLS results reported in Table 4 to 6 are robust to the unequal distribution of sample firms across different countries.

As a further check, we construct two reduced samples: one after excluding Japan from the sample; and the other after excluding the U.K. Columns 3 and 4 of Table 2 present the results of our full-model regression in Eq. (4) using the sample which excludes Japan, while columns 5 and 6 report the same using the sample excluding the U.K. As shown in column 3-6, the coefficients on our four test variables, i.e., *Wedge* (H1), *Wedge*Institution* (H2), *Wedge*NAF* (H3), and *NAF*Institution* (H4), overall, remain

highly significant with expected signs. Overall, the regression results remain qualitatively unaltered except that the coefficient on *NAF* becomes insignificant only in column 3. Collectively, the results of our robustness checks reported in Table 7 indicate that our regression results reported in Tables 4 to 6 are unlikely to be driven by a few countries with large observations.

[INSERT TABLE 7 ABOUT HERE!]

7. Conclusion

Using a sample of firms with ultimate ownership data from 9 East Asian and 13 Western European countries, this study investigates whether the wedge between voting rights (control) and cash flow rights (ownership) influences a firm's information environment, in particular, the extent to which firm-specific information is incorporated into stock prices which we conveniently call stock price informativeness (SPI). We find that the control-ownership wedge is an important factor that adversely affects SPI even after controlling for all other factors known to influence SPI, and the SPI-reducing effect of the wedge is conditioned upon the intensity of analyst activities proxied by analyst coverage and the strength of a country's institutions. Specifically, we find that SPI decreases with the control-ownership wedge, and that the SPI-reducing effect of the wedge is attenuated for firms with high analyst following and in countries with strong institutions. Finally, we also find that, consistent with evidence reported in previous research, SPI decreases with analyst following, but this SPI-reducing effect of analyst coverage is attenuated in countries with strong institutions. This finding suggests that

strong institutional environments are conducive to analysts producing and disseminating more firm-specific information relative to common information.

In conclusion, our evidence suggests that the control-ownership wedge is a major source of agency problems which provide controlling shareholders with incentives and opportunities to extract private control benefits. Concentrated control power in excess of ownership rights allows them to withhold or selectively disclose their firm-specific, private information to outside minority shareholders in an attempt to mask the valuation implications of their rent-seeking behaviors. As a result, information arbitrageurs are more likely to invest less in high-wedge firms, and less firm-specific information is capitalized into stock prices via information-based trading.

The results of this study are subject to an important caveat. As in other studies that use the same ultimate ownership data used in this study, we implicitly assume that the ultimate ownership of our sample firms remains stable over our sample period as we do not have the data for all years in our sample period. While corporate ownership structure is relatively stable over time, one cannot rule out the possibility that our assumption may not hold throughout the sample period. To this extent, our results should be interpreted cautiously. We recommend further research using an enlarged set of ultimate ownership data over an extended period and from additional countries that are not included in our study.

[INSERT APPENDIX A HERE!]

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Appendix A: Variable definitions and data sources

Variable		Definition	Data Source
Panel A: Dependent variable and test variables			
Cash Flow Rights	=	The ultimate cash flow rights by the largest controlling shareholder.	*Claessens et al. [2000), Faccio and Lang [2002]*
Voting Rights	=	The ultimate voting rights by the largest controlling shareholder.	*Claessens et al. [2000), Faccio and Lang [2002]*
Wedge	=	Voting rights over cash flow rights by the largest controlling shareholder.	*Claessens et al. [2000), Faccio and Lang [2002]*
SPI	=	Log of $((1-R^2)/R^2)$, R^2 is from Eq. (1) of firm returns on market returns and U.S. market return adjusted by exchange rate (Morck, Yeung and Yu, 2000), representing firm return variation.	*Data Stream*
NAF	=	The number of analysts issuing forecasts for the firm.	*IBES Interrnational*
Panel B: Firm-specific control variables			
MKTCAP	=	Firm size measured by the natural log of market capitalization at the end of the year (in USD, $million).	*Worldscope*
MB	=	Market value of equity scaled by book value of equity.	*Worldscope*
LEV	=	The long term debt scaled by book value of shareholders' equity at the end of the year.	*Worldscope*
STDROA	=	The standard deviation of ROA measured over past five years including current year.	*Worldscope*
ACCR	=	Absolute value of accounting accruals scaled by the absolute value of operating cash flow.	*Worldscope*
VOL	=	Total annual transaction volume divided by total shares outstanding (%).	*Data Stream*
LOSS	=	1 if net income before extraordinary is negative and 0 otherwise.	*Worldscope*
CROSS	=	1 if a firm cross list in the foreign exchange, and 0 otherwise.	*Worldscope*
IndustryDummies	=	Industry indicators based on two-digit SIC code.	*Worldscope*
Panel C: Country institutional variables			
Corruption	=	International Country Risk (ICR)'s assessment of the corruption in government. Lower scores indicate that 'high government officials are likely to demand special payments' and 'illegal payments are generally expected throughout lower levels of government' in the form of 'bribes connected with import and export licenses, exchange controls, tax assessment, policy protection, or loans.' Average of the months of April and October of monthly index between 1982 and 1995. Scale from 0 to 10, with lower scores for higher levels of corruption.	*La Porta et al. [1998]*
Expropriation	=	International Country Risk (ICR)'s assessment of 'outright confiscation' or 'forced nationalization.' Average of the months of April and October of the monthly index between 1982 and 1995. Scale from 0 to 10, with lower scores for higher risks.	*La Porta et al. [1998]*

Repudiation	=	International Country Risk (ICR)'s assessment of the 'risk of a modification in a contract taking the form of a repudiation, postponement, or scaling down' due to 'budget cutbacks, indigenization pressure, a change in government, or a change in government economic social priorities.' Average of the months of April and October of the monthly index between 1982 and 1995. Scale from 0 to 10, with lower scores for higher risks.	*La Porta et al. [1998]*
GoodGov	=	Sum of Corruption, Expropriation, and Repudiation.	
AntiDir	=	An index of anti-director rights, which is formed by adding one when: (1) the country allows shareholders to mail their proxy vote, (2) shareholders are not required to deposit their shares prior to the General Shareholder's Meeting, (3) cumulative voting or proportional representation of minorities on the board of directors is allowed, (4) an oppressed minorities mechanism is in place, (5) the minimum percentage of share capital that entitles a shareholder to call for an Extraordinary Shareholders' Meeting is less than or equal to 10% (the sample median), and (6) when shareholders have preemptive rights can only be waived by a shareholders' meeting. The range for index is from 0 to 6.	*La Porta et al. [1998, 2002]*
EffJud	=	Assessment of the efficiency and integrity of legal environment as it affects business, particularly foreign firms, produced by country risk rating agency Business International Corp. It 'may be taken to present investors' assessment of conditions in the country in question.' Average between 1980 and 1983. Scale from 0 to 10, with lower scores representing lower efficiency levels.	*La Porta et al. [1998]*
LawRule	=	Assessment of the law and other condition in the country produced by the country risk rating agency International Country Risk (ICR). Average of the months of April and October of the monthly index between 1982 and 1995. Scale from 0 to 10, with lower scores for less tradition for law and other	*La Porta et al. [1998]*
InvPro	=	Arithmetic mean of percentage rank of AntiDir, EffJud and LawRule	

Table 1 Sample distribution

Panel A: Country distribution

Country	**AUT**	**BEL**	**CHE**	**DEU**	**ESP**	**FIN**	**FRA**	**GBR**	**HKG**	**IDN**	**IRL**	
#	138	153	418	88	270	149	1170	2234	628	350	10	
Country	**ITA**	**JPN**	**KOR**	**MYS**	**NOR**	**PHL**	**PRT**	**SGP**	**SWE**	**THA**	**TWN**	**Total**
#	423	3991	750	446	319	196	179	483	371	311	465	**13542**

Panel B: Yearly distribution

Year	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**Total**
#	1589	1937	2240	2555	2667	2554	**13542**

Note:

AUT	Austria	ITA	Italy
BEL	Belgium	JPN	Japan
CHE	Switzerland	KOR	Korea
DEU	Germany	MYS	Malaysia
ESP	Spain	NOR	Norway
FIN	Finland	PHL	Philippines
FRA	France	PRT	Portugal
GBR	UK	SGP	Singapore
HKG	Hong Kong	SWE	Sweden
IDN	Indonesia	TWN	Taiwan
IRL	Ireland	THA	Thailand

Table 2 Descriptive statistics

This table reports summary statistics for test and control variables. *SPI* is the dependent variable used in all regressions in the paper, measured by the log of $((1-R^2)/R^2)$ where R^2 is the explanatory power of the market model in Eq. (1). *Wedge* is measured by the ratio of the largest ultimate owner's voting rights to cash flow rights. *NAF* is the number of analysts issuing forecasts for a firm's future earnings. *MKTCAP* is the natural log of market capitalization at the end of the year (in $million). *MB* is market value of equity scaled by book value of equity. *LEV* is long-term debt scaled by book value of shareholders' equity. *STDROA* is the standard deviation of ROA measured over past five years including current year. *ACCR* is absolute value of accounting accruals scaled by the absolute value of operating cash flow. *VOL* is total annual transaction volume divided by total shares outstanding. *LOSS* equals to 1 if net income before extraordinary is negative, and 0 otherwise. *CROSS* equals to 1 if a firm cross list in foreign exchange, and 0 otherwise. The exact definitions of all variables are provided in Appendix A.

Variables	N	Mean	Std. Dev.	5th Ptcl.	25th Pctl.	50th Pctl.	75th Pctl.	95th Pctl.
Panel A: Voting rights and cash flow rights of controlling shareholders								
Wedge	13542	1.7833	1.9867	1.0000	1.0000	1.0000	1.7333	5.0000
***Voting Rights* (%)**	13542	24.4027	15.1162	5.0000	11.0000	21.0000	35.0000	50.0000
***Cash Flow Rights* (%)**	13542	20.5368	15.7490	2.0000	6.6080	16.1350	31.8462	50.0000
Panel B: Test variables								
SPI	13542	2.1220	1.2910	0.2399	1.1312	1.9658	2.9804	4.5109
NAF	13542	10.1578	17.6515	0.0000	0.0000	3.0000	12.0000	49.0000
Panel C: Control variables								
MKTCAP	13542	11.5941	2.4287	6.9547	10.4207	11.8419	13.0961	15.1895
MB	13542	2.1764	3.5884	0.3248	0.8792	1.4661	2.4262	6.0875
LEV	13542	0.5725	1.3194	0.0000	0.0457	0.2688	0.6727	2.2046
STDROA	13542	0.0693	0.4223	0.0035	0.0155	0.0299	0.0585	0.1809
ACCR	13542	1.3943	3.1979	0.0901	0.3910	0.6864	1.0609	4.6912
VOL	13542	1.0319	7.6057	0.0090	0.0818	0.2360	0.5148	2.1890
LOSS	13542	0.2027	0.4020	0.0000	0.0000	0.0000	0.0000	1.0000
CROSS	13542	0.0129	0.1129	0.0000	0.0000	0.0000	0.0000	0.0000

Panel D: Univariate tests for sub-samples grouped by the level of control-ownership wedge

Portfolios formed by the largest controlling shareholders' "control over ownership"

	WEDGE=1 (N=8017)	WEDGE>1 (N=5525)	Difference	Test statistics	*p*-value (two-sided)
Mean				*t*-stat	
SPI	2.234	1.9595	**0.2745**	12.23	0.00
NAF	10.2860	9.9721	0.3139	1.02	0.31
Median				*Z*-stat	
SPI	2.0930	1.7760	**0.3169**	-12.16	0.00
NAF	2.0000	3.0000	**-1.0000**	2.72	0.01

Table 3 Pearson correlation matrix

All variables are as defined in Appendix A. *p*-value is displayed in right below. The bold-faced (bold-faced italic) coefficients are significant at less than the 1% (10%) level (two-tailed tests).

	SPI	***Wedge***	***V***	***C***	***NAF***	***MKTCAP***	***MB***	***LEV***	***STDROA***	***ACCR***	***VOL***	***LOSS***	***CROSS***
SPI	1.0000												
Wedge	**-0.1031**	1.0000											
	0.00												
V	**0.1449**	**-0.1963**	1.0000										
	0.00	0.00											
C	**0.1644**	**-0.3947**	**0.9148**	1.0000									
	0.00	0.00	0.00										
NAF	**-0.1523**	-0.0099	0.0125	0.0120	1.0000								
	0.00	0.25	0.14	0.16									
MKTCAP	**-0.2639**	**0.0323**	**-0.3831**	**-0.3591**	**0.3351**	1.0000							
	0.00	0.00	0.00	0.00	0.00								
MB	**0.0188**	**-0.0181**	0.0063	***0.0158***	**0.0567**	**0.1329**	1.0000						
	0.03	0.04	0.47	0.07	0.00	0.00							
LEV	**-0.0539**	**0.0486**	**-0.0500**	**-0.0563**	0.0052	**0.0731**	**0.1851**	1.0000					
	0.00	0.00	0.00	0.00	0.54	0.00	0.00						
STDROA	**0.0634**	**-0.0259**	**0.0662**	**0.0739**	**-0.0357**	**-0.0952**	***-0.0149***	**-0.0210**	1.0000				
	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.01					
ACCR	**0.0251**	0.0122	***-0.0151***	-0.0138	**-0.0413**	**-0.0516**	**-0.0281**	0.0113	0.0012	1.0000			
	0.00	0.16	0.08	0.11	0.00	0.00	0.00	0.19	0.89				
VOL	-0.0003	**-0.0311**	**-0.0281**	-0.0113	**-0.0371**	**-0.0531**	**-0.0194**	**-0.0174**	***0.0143***	**0.0208**	1.0000		
	0.97	0.00	0.00	0.19	0.00	0.00	0.02	0.04	0.10	0.02			
LOSS	**0.0579**	0.0043	**-0.0381**	**-0.0297**	**-0.1116**	**-0.1585**	**-0.0211**	**0.1263**	**0.0400**	**0.1823**	**0.0934**	1.0000	
	0.00	0.61	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00		
CROSS	**0.0518**	**-0.0311**	**0.0489**	**0.0484**	**-0.0520**	-0.0131	**0.0282**	-0.0045	0.0004	-0.0019	-0.0123	0.0123	1.0000
	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.60	0.96	0.83	0.15	0.15	

Table 4 The relation between control-ownership wedge and stock price informativeness.

The dependent variable, *SPI*, is the log of $((1-R^2)/R^2)$ where R^2 is the explanatory power of the market model in Eq. (1). *Wedge* is measured by the ratio of the largest ultimate owner's voting rights to cash flow rights. All other variables are as defined in Appendix A. All *p*-value are on an adjusted basis using robust standard errors corrected for firm-level clustering. The bold-faced (bold-faced italic) coefficients are significant at less than the 1% (10%) level (two-tailed tests).

	(1)		(2)		(3)	
Variables	**Coefficient**	***p*-value**	**Coefficient**	***p*-value**	**Coefficient**	***p*-value**
Test variables						
Wedge	**-0.0335**	0.00			**-0.0261**	0.00
Cash Flow Rights			**0.0047**	0.00	**0.0031**	0.00
Control variables						
MKTCAP	**-0.2546**	0.00	**-0.2518**	0.00	**-0.2525**	0.00
MB	**0.0059**	0.05	***0.0057***	0.06	***0.0057***	0.06
LEV	-0.0096	0.20	-0.0098	0.20	-0.0094	0.22
STDROA	**0.0522**	0.00	**0.0519**	0.00	**0.0517**	0.00
ACCR	0.0029	0.26	0.0026	0.30	0.0028	0.28
VOL	0.0008	0.53	0.0010	0.41	0.0009	0.48
LOSS	**-0.0972**	0.00	**-0.0954**	0.00	**-0.0952**	0.00
CROSS	**0.3424**	0.02	**0.3839**	0.01	**0.3652**	0.02
Intercept	**6.6039**	0.00	**6.4929**	0.00	**6.5852**	0.00
Year, Industry and Country dummies	Included		Included		Included	
N	13542		13542		13542	
Adj R-square	0.3221		0.3216		0.3227	

Table 5 The effect of country institutions on the association between control-ownership wedge and stock price informativeness.

The dependent variable, *SPI*, is the log of $((1-R^2)/R^2)$ where R^2 is the explanatory power of the market model in Eq. (1). *Wedge* is measured by the ratio of the largest ultimate owner's voting rights to cash flow rights. All other variables are as defined in Appendix A. All *p*-values are on an adjusted basis using robust standard errors corrected for firm-level clustering. The bold-faced (bold-faced italic) coefficients are significant at less than the 1% (10%) level (two-tailed tests).

	(1)		(2)	
Institution=	***GoodGov***		***InvPro***	
Variables	**Coefficient**	***p*-value**	**Coefficient**	***p*-value**
Test variables				
Wedge	**-0.2464**	0.00	**-0.0650**	0.00
Institution	**0.0898**	0.00	**1.3847**	0.00
Wedge*Institution	**0.0077**	0.01	***0.0434***	0.09
Control variables				
MKTCAP	**-0.2543**	0.00	**-0.2540**	0.00
MB	***0.0057***	0.06	***0.0058***	0.06
LEV	-0.0095	0.21	-0.0096	0.20
STDROA	**0.0523**	0.00	**0.0523**	0.00
ACCR	0.0029	0.27	0.0029	0.27
VOL	0.0008	0.55	0.0008	0.53
LOSS	**-0.0959**	0.00	**-0.0964**	0.00
CROSS	**0.3513**	0.02	**0.3473**	0.02
Intercept	-0.7195	0.19	**0.8020**	0.00
Year, Industry and Country dummies	Included		Included	
N	13542		13542	
Adj R-square	0.3227		0.3223	

Table 6 The joint effect of analyst coverage and country institutions on the association between wedge and stock price informativeness.

The dependent variable, *SPI*, is the log of $((1-R^2)/R^2)$ where R^2 is the explanatory power of the market model in Eq. (1). *Wedge* is measured by the ratio of the largest ultimate owner's voting rights to cash flow rights. *NAF* is the number of analysts issuing forecasts for a firm's future earnings. *Institution* represents the strength of a country's institutions. All other variables are as defined in Appendix A. All *p*-values are on an adjusted basis using robust standard errors corrected for firm-level clustering. The bold-faced (bold-faced italic) coefficients are significant at less than the 1% (10%) level (two-tailed tests).

	(1)		(2)		(3)		(4)		(5)	
Institution=			***GoodGov***		***InvPro***		***GoodGov***		***InvPro***	
Variables	**Coefficient**	***p*-value**	**Coefficient**	***p*-value**	**Coefficient**	***p*-value**	**Coefficient**	***p*-value**	**Coefficient**	***p*-value**
Test variables										
Wedge	**-0.0334**	0.00					**-0.2481**	0.00	**-0.0697**	0.00
NAF	**-0.0022**	0.00	**-0.0163**	0.00	**-0.0130**	0.00	**-0.0141**	0.01	**-0.0123**	0.00
Wedge*NAF	***0.0005***	0.07					**0.0071**	0.05	**0.0016**	0.02
Institution			**0.0744**	0.00	**1.1958**	0.00	**0.0664**	0.00	**1.1706**	0.00
Wedge*Institution							**0.0109**	0.00	**0.0694**	0.05
NAF*Institution			**0.0005**	0.01	**0.0154**	0.00	**0.0009**	0.00	**0.0174**	0.00
Wedge*NAF*Institution							***-0.0002***	0.07	-0.0016	0.18
Control variables										
MKTCAP	**-0.2436**	0.00	**-0.2449**	0.00	**-0.2472**	0.00	**-0.2438**	0.00	**-0.2457**	0.00
MB	***0.0054***	0.07	***0.0055***	0.07	**0.0060**	0.05	***0.0052***	0.09	***0.0057***	0.06
LEV	-0.0092	0.22	-0.0097	0.20	-0.0097	0.20	-0.0083	0.27	-0.0084	0.26
STDROA	**0.0507**	0.00	**0.0517**	0.00	**0.0516**	0.00	**0.0507**	0.00	**0.0507**	0.00
ACCR	0.0029	0.25	0.0028	0.28	0.0027	0.29	0.0029	0.27	0.0028	0.27
VOL	0.0009	0.50	0.0010	0.43	0.0010	0.43	0.0008	0.53	0.0008	0.50
LOSS	**-0.0947**	0.00	**-0.0989**	0.00	**-0.0985**	0.00	**-0.0951**	0.00	**-0.0950**	0.00
CROSS	**0.3169**	0.04	**0.3195**	0.03	**0.3183**	0.03	**0.3167**	0.04	**0.3119**	0.04
Intercept	**-0.5887**	0.00	**4.5146**	0.00	**5.7986**	0.00	**4.8109**	0.00	**5.9811**	0.00
Year, Industry and country dummies	Included		Included		Included		Included		Included	
N	13542		13542		13542		13542		13542	
Adj R-square	0.3230		0.3210		0.3219		0.3242		0.3245	

Table 7 Robustness checks

The dependent variable, *SPI*, is the log of $((1-R^2)/R^2)$ where R^2 is the explanatory power of the market model in Eq. (1). *Wedge* is measured by the ratio of the largest ultimate owner's voting rights to cash flow rights. *NAF* is the number of analysts issuing forecasts for a firm's future earnings. *Institution* represents the strength of a country's institutions. All other variables are as defined in Appendix A. All *p*-values are on an adjusted basis using robust standard errors corrected for firm-level clustering. The bold-faced (bold-faced italic) coefficients are significant at less than the 1% (10%) level (two-tailed tests).

	Country-weighted regression				**Exclude Japan**				**Exclude UK**			
	(1)		**(2)**		**(3)**		**(4)**		**(5)**		**(6)**	
Institution=	***GoodGov***		***InvPro***		***GoodGov***		***InvPro***		***GoodGov***		***InvPro***	
Variables	**Coefficient**	***p*-value**	**Coefficient**	***p*-value**	**Coefficient**	***p*-value**	**Coefficient**	***p*-value**	**Coefficient**	***p*-value**	**Coefficient**	***p*-value**
Test variables												
Wedge	**-0.2747**	0.00	**-0.0844**	0.00	**-0.2567**	0.00	**5.7553**	0.00	**-0.2624**	0.00	**-0.0728**	0.00
NAF	**-0.0126**	0.04	**-0.0097**	0.00	-0.0063	0.27	**-0.0776**	0.00	**-0.0147**	0.01	**-0.0129**	0.00
Wedge*NAF	**0.0075**	0.03	**0.0023**	0.00	**0.0069**	0.03	**-0.0068**	0.01	**0.0072**	0.05	**0.0016**	0.02
Institution	**0.0848**	0.00	**1.4364**	0.00	**0.0725**	0.00	**0.0020**	0.00	**0.0711**	0.00	**1.2409**	0.00
Wedge*Institution	**0.0115**	0.00	**0.1077**	0.00	**0.0110**	0.00	**1.2362**	0.00	**0.0106**	0.00	***0.0660***	0.06
NAF*Institution	**0.0008**	0.01	**0.0136**	0.00	**0.0005**	0.04	**0.1077**	0.00	**0.0009**	0.00	**0.0186**	0.00
Wedge*NAF*Institution	**-0.0003**	0.04	**-0.0028**	0.01	**-0.0003**	0.03	**0.0094**	0.02	***-0.0002***	0.07	-0.0015	0.20
Control variables												
MKTCAP	**-0.2657**	0.00	**-0.2647**	0.00	**-0.2526**	0.00	**-0.0029**	0.01	**-0.2487**	0.00	**-0.2509**	0.00
MB	0.0053	0.29	0.0058	0.26	**0.0074**	0.01	**-0.2523**	0.00	**0.0121**	0.02	**0.0136**	0.01
LEV	-0.0081	0.41	-0.0076	0.43	-0.0074	0.36	**0.0075**	0.01	-0.0100	0.20	-0.0102	0.18
STDROA	**0.0450**	0.00	**0.0449**	0.00	**0.0523**	0.00	-0.0071	0.37	**0.0510**	0.00	**0.0509**	0.00
ACCR	0.0013	0.69	0.0012	0.70	0.0036	0.27	**0.0527**	0.00	0.0012	0.66	0.0011	0.67
VOL	0.0010	0.49	0.0011	0.44	0.0008	0.54	0.0035	0.27	0.0010	0.43	0.0011	0.41
LOSS	-0.0157	0.74	-0.0148	0.75	-0.0280	0.39	0.0009	0.50	**-0.1179**	0.00	**-0.1183**	0.00
CROSS	**0.3605**	0.02	**0.3617**	0.02	**0.3304**	0.05	-0.0271	0.40	**0.3144**	0.04	**0.3127**	0.04
Intercept	**4.4569**	0.00	**5.9005**	0.00	**4.5068**	0.00	**0.3243**	0.05	**4.8368**	0.00	**6.0634**	0.00
Year, industry, country dummies	included		included		included		included		included		included	
N	13542		13542		9551		9551		11308		11308	
Adj R-square	0.3662		0.3649		0.3396		0.3395		0.2843		0.2848	