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Does insider trading regulation deter private information trading? International evidence ☆

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Abstract

Using a sample of 2189 firms from 21 countries we find that, on average, stricter insider trading regulations reduce private information trading. However, for firms with high agency costs, insider trading restrictions are less effective in deterring private information trading. We suggest that controlling shareholders who are banned from trading may resort to covert expropriation of firm resources thereby reducing transparency and increasing the returns to private information trading. Consistent with this, we find that firms with higher agency costs located in countries with stricter insider trading laws have more opaque earnings and are valued lower.

JEL classification: G15; G14; G38
Keywords: Insider trading regulation; Ownership wedge; Private information trading, Earnings opacity

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1. Introduction

There is a long-standing debate in the finance, economics and law literatures about the need for insider trading regulation. Its critics argue that insider trading may serve as an efficient form of compensation for insiders. Moreover, insider trading allows private information to be quickly incorporated into stock prices, thereby leading to more informationally efficient stock prices (Carlton and Fischel, 1983; Dye, 1984). Proponents of insider trading regulation contend that insider trading subjects uninformed outsiders to an adverse selection problem, discourages investment, and damages corporate value (Manove, 1989; Ausubel, 1990; Fischer, 1992). Moreover, allowing insiders to trade at the expense of uninformed outsiders diminishes investor confidence and hurts the integrity of capital markets (Brudney, 1979; Easterbrook, 1985; Glosten, 1989; Maug, 1995, 2002).

In keeping with the latter viewpoint, many countries have adopted insider trading laws. A survey by Bhattacharya and Daouk (2002) finds that out of 103 countries that have stock markets, 87 have introduced insider trading rules. A principal goal of introducing insider trading restrictions appears to be to prevent informationally advantaged insiders from trading at the expense of the uninformed public. The objective of this paper is to examine whether insider trading regulation achieves its goal. Specifically, we examine whether insider trading regulation, on average, deters private information trading. Using a sample of 2189 firms from 21 countries we find that it does. A cross-sectional regression analysis shows that firms in countries with stricter insider trading restrictions are less subject to private information trading. Since the cross-sectional analysis is likely to suffer from endogeneity problems, we also conduct an event study which compares private information trading before and after the enforcement of insider trading restrictions. Consistent with the cross-sectional results, the event study reveals that the amount of private information trading decreases significantly after the first enforcement of insider trading laws.

This paper also examines whether the effect of insider trading restrictions on private information trading depends on the degree of agency problems inherent in the firm. We measure agency costs as the ownership wedge—the difference between control rights and cash flow rights of the largest shareholder. Greater separation of ownership and control is indicative of entrenched shareholders who often use firm resources to generate private benefits of control that are not shared by minority shareholders. In the presence of insider trading restrictions, entrenched controlling shareholders are more likely to have an incentive to continue trading as well as the means to mask the trades using various methods like offshore accounts, nominee accounts, etc. Therefore, we expect insider trading restrictions to be less effective in reducing private information trading in stocks of firms with a higher ownership wedge. Our data show that although insider trading restrictions lower private information trading on average, they are significantly less successful in doing so when the ownership wedge is high. This result supports the notion that controlling shareholders of firms with greater ownership wedge are less likely to be deterred from insider trading by the introduction of insider trading restrictions.

Another theme of our paper is to argue that the observed positive association between insider trading restrictions and private information trading in stocks with high ownership wedge may exist because insider trading restrictions foster greater information asymmetry in firms afflicted with high agency costs. We argue that restricting insider trading without closing other channels of expropriation may encourage controlling shareholders with high ownership wedge to seek other methods of diverting resources away from minority shareholders.[2] When controlling shareholders engaged in

[2] Other methods of expropriating resources from a firm may include elaborate transfer pricing schemes, special dividends, perquisites and outright stealing (Shleifer and Vishny, 1997; Johnson et al., 2000).

activities that are not in the best interests of the firm, they attempt to mask the resulting poor performance of the firm (Leuz et al., 2003). This opacity about the firm's operations increases the return to private information acquisition and trading. This is another explanation for our finding that insider trading restrictions are less effective in reducing private information trading in firms with high separation of ownership and control.[3]

We test this potential explanation in several ways. First, we examine the effect of insider trading restrictions on earnings opacity conditional on the ownership wedge. We find that when ownership wedge is high, insider trading restrictions are associated with greater earnings opacity. Second, we investigate whether insider trading restrictions distort the incentives of controlling shareholders in a manner detrimental to firm value. As in Beny (2006) we find that insider trading restrictions are on average associated with higher firm value. However, a higher ownership wedge significantly diminishes the positive association between insider trading restrictions and firm value. We argue that the value destruction arises not just because controlling shareholders refrain from monitoring the firm sufficiently when restricted from trading, but also because controlling shareholders may be actively involved in expropriating resources from minority shareholders.

To further support this interpretation, we recognize that the positive association between private information trading and the interaction of ownership wedge with insider trading restrictions is more likely in countries where insiders find it relatively easy to resort to expropriation, i.e., in countries with poor investor protection standards. Therefore, we repeat our analyses for sub-samples of low- and high-investor protection countries. We find that in the high-investor protection sub-sample, insider trading restrictions are unambiguously associated with lower private information trading, earnings opacity, and higher firm value. However, in countries with poor investor protection, the combination of strict insider trading restrictions and a high ownership wedge could lead to higher private information trading, higher earnings opacity and lower firm value.

This paper is related to recent research by Ackerman and Maug (2006) and Fernandes and Ferreira (2006) who investigate the effectiveness of insider trading legislation at the country level. Ackerman and Maug examine stock return run-ups prior to acquisitions and conclude that insider trading laws reduce run-ups but only in countries with good law enforcement. Fernandes and Ferreira (2006) perform a test similar to our event study methodology by comparing stock price informativeness before and after the first enforcement of insider trading laws. Their conclusion is in line with ours; that is, insider trading laws are less effective in developing countries where agency costs are higher. Both papers can be viewed as complementary to our research.

The paper is arranged as follows. Section 2 presents our hypotheses. Section 3 describes the sample, variables and empirical methodology. The empirical results and robustness checks appear in Section 4. Section 5 concludes.

2. Hypotheses

Insider trading restrictions have been introduced in most markets in the last decade, and in many, the restrictions have also been enforced with the prosecution of those violating the

[3] Microstructure literature suggests that while insider trading regulation reduces trading by insiders, it may increase private information acquisition by outsiders. Insider trading regulation reduces the competition outsiders face from better-informed insiders and thereby increases their return to information acquisition. Outsiders, who can acquire private information at a cost, are not subject to insider trading restrictions but may also trade at the expense of the uninformed investors (Fishman and Hagerty, 1992; Shin, 1996). In this paper, we do not investigate how insider trading restrictions affect the incentives of different types of investors, insiders versus outsiders; instead, we concentrate on the aggregate effect of insider trading regulation on private information trading.

rules. Insider trading restrictions are expected to reduce adverse selection facing the uninformed investors and encourage them to participate in the market. Bhattacharya and Daouk (2002) find that the cost of equity declines after the first prosecution of insider trading. This is consistent with the notion that outside investors are aware of the existence of private information trading by insiders and take account the resulting adverse selection when calculating expected returns.

This paper first examines whether insider trading restrictions are, on aggregate, associated with lower informed trading. The findings of Bhattacharya and Daouk (2002) suggest that on average insider trading restrictions reduce private information trading and are consequently associated with a lower cost of capital. We argue that under some conditions, insider trading restrictions are less successful in reducing informed trading and therefore, it is not obvious that insider trading restrictions will reduce the return demanded by uninformed investors. Specifically, insider trading restrictions are less effective in companies where the separation of ownership and control is higher, and consequently, agency problems more severe.

Existing literature demonstrates that shareholders who have high levels of control but lack sufficient cash flow rights seek private benefits which are not shared with minority shareholders. Insider trading is one avenue for expropriating profits from outside investors. When ownership wedge is high, controlling shareholders are more likely to engage in insider trading to make up for their scarce cash flow rights. They are also less likely to relinquish trading profits if insider trading restrictions are imposed because concentrated control provides more opportunities to mask insider trades through the use of offshore accounts, nominee accounts, independent manager-owned companies, etc. Thus, we hypothesize that insider trading restrictions will be less successful in curbing insider trading in companies where the ownership wedge is high. We examine the effect of insider trading restrictions on private information trading conditional on the separation of ownership and control. We expect to find that insider trading restrictions are associated with higher private information trading in firms with a higher ownership wedge.

This paper also provides an alternative explanation for why insider trading restrictions may be associated with higher informed trading in firms with high ownership wedge—namely, greater information asymmetry. Existing literature suggests that insider trading is an important source of benefits for controlling shareholders which, if removed, can discourage controlling shareholders from actively monitoring the firm (Bhide, 1993; Demsetz, 1986).[4] Insider trading is one of many different ways in which controlling shareholders, devoid of sufficient cash flow rights, can expropriate minority shareholders. Ceteris paribus, restricting insider trading may simply drive controlling shareholders to expropriate through other means such as transfer pricing, tunneling, special dividends or outright diversion. If controlling shareholders are engaged in activities that are not in the best interests of the firm, they are likely to mask the resulting poor performance of the firm (Leuz et al., 2003) through, for example, earnings management. The resulting opaque environment can increase the returns to private information acquisition and trading. Therefore, we examine the effect of insider trading restrictions on private information trading and earnings opacity conditional on the ownership wedge. We expect that in the presence of a higher ownership wedge, insider trading

[4] We use the terms "controlling shareholder" and "insider" interchangeably. Although our arguments hold for any insider who wields sufficient control in the firm, our empirical tests focus on a subset of insiders—controlling shareholders.

restrictions are associated with greater private information trading and higher earnings opacity.[5]

The notion that insider trading restrictions drive controlling shareholders to covert expropriation of firm resources can be tested indirectly. We split our sample into firms that belong to countries with high and low-investor protection sub-samples. In countries where investor rights are well protected, it is costlier for controlling shareholders who have been deprived of insider trading profits to resort to other means of expropriation. Therefore, we are unlikely to observe the aforementioned increase in earnings opacity and private information trading when insider trading restrictions and a high ownership wedge coexist. Rather, this relation is expected to be observed only in countries where minority shareholder rights are poorly protected and controlling shareholders find it easier to replace insider trading profits with other covert forms of expropriation.

Finally, to examine whether insider trading restrictions distort the incentives of controlling shareholders we also examine the association between insider trading restrictions and firm value conditional on ownership wedge. This conditional relation between firm value and insider trading restrictions is also tested for the high- and low-investor protection sub-samples described above.

3. Sample and variables

This section describes the empirical methodology, sample construction, and main variables.

3.1. Empirical setup

Our primary regressions are of the form,

$$\mathrm{PRIVATE}_i^c = \alpha + \beta_1 \mathrm{CASH}_i^c + \beta_2 \mathrm{WEDGE}_i^c + \beta_3 \mathrm{INS}^c + \gamma \mathrm{WEDGE}_i^c * \mathrm{INS}^c + \sum_{k=1}^{K} \delta_k Z_{k,i}^c + \varepsilon_i^c, \quad (1)$$

where i indexes firms, c indexes countries, PRIVATE is the measure of private information trading, WEDGE is ownership wedge, INS is a measure of the strictness of insider trading laws, WEDGE × INS is the interaction of control concentration with a measure of the strictness of insider trading laws, and Z's are control variables.

We estimate these regressions using country-random effects to take into account the possibility that observations on individual firms in a given country can be correlated. We check the validity of country-random effects specification with the Breusch and Pagan (1980) test. In almost all specifications, the test rejects the hypothesis that the variation of random effects is 0. Alternatively, as suggested in Petersen (2005), we calculate coefficients standard errors and their

[5] We recognize the possibility that there may be a positive relation between the amounts of insider trading and expropriation. When insiders engage in expropriation of firm resources they expect firm value to suffer in the future. This advance knowledge could encourage insiders to sell some of their holdings before firm value drops. That is, expropriation could create opportunities for insider trading. However, if insiders take this opportunity and sell, they may attract the market's attention and increase the probability that unlawful activities within the firm are detected. Insiders who expect firm value to decline because of their expropriation have to balance the benefit of selling stock before prices fall against the probability that the selling draws unwanted attention to their illegal actions. The stricter the laws against insider trading and expropriation, the less likely it is that insiders take advantage of the trading opportunities created by their own stealing.

significance values using clustered (by country) robust standard errors. Both methods give us similar results in terms of coefficients' significance.

We predict that stricter insider trading laws are associated with less private information trading ($\beta_2 < 0$), and that insider trading laws are less effective in reducing private information trading for firms with high ownership wedge ($\gamma > 0$).

The regression coefficients can be biased because of endogeneity. Endogeneity could arise due to unobserved variables that are correlated with both ownership structure and the amount of private information trading. It may also arise due to a reverse causality between ownership wedge and private information trading. For example, in countries where higher profits can be obtained through private information trading, shareholders may choose to acquire greater control in order to have privileged access to nonpublic information. We address endogeneity in two ways. First, we perform an event study by comparing the changes in the private information trading variable for all firms around years of the first enforcement of insider trading restrictions. We also examine the changes in PRIVATE conditional on firm-level ownership wedge. This approach controls for unobserved time-invariant firm- and country-specific factors that can cause endogeneity. Second, we address endogeneity issues by estimating (1) with instrumental variables, using legal origin dummies as instruments for the ownership variables.

We also estimate Eq. (1) for strong- and weak-investor protection sub-samples. If insider trading restrictions become less effective in the presence of high ownership wedge because controlling shareholders resort to other forms of expropriation, we expect the coefficient γ to be significant only in countries where the cost of expropriation is low, i.e., in the poor investor protection sub-sample. Finally, we repeat all regressions with earnings opacity and firm valuation as dependent variables.

3.2. Sample and variables

To quantify the amount of private information trading, we use a measure developed by Llorente et al. (2002), which is based on stock return autocorrelation conditional on trading volume. The amount of private information trading, PRIVATE, is defined as the coefficient C_2 in the time-series regression,

$$R^c_{i,t+1} = A^c_i + C^c_{i,1} R^c_{i,t} + C^c_{i,2} R^c_{i,t} V^c_{i,t} + \varepsilon^c_{i,t}, \tag{2}$$

run for each firm i in country c using at least 30 days of trading data from January 2nd, 1995 through December 29th, 1997. In (2), $R^c_{i,t}$ are daily returns $V^c_{i,t}$ is trading volume. Llorente et al. argue that estimated coefficient C_2 in (2) increases as more information becomes available to insiders but is not shared with the general public.[6] The measurement period for PRIVATE, 1995–1997, is chosen to avoid the period after the 1998 financial crisis after which many Asian firms changed their ownership structure. We obtain daily closing prices, numbers of shares traded, and the number of shares outstanding from Datastream, and dividends per share from Worldscope.

We match ownership data (Claessens et al., 2002 for East Asian companies, and Faccio and Lang, 2002, for Western European companies) with PRIVATE by company name. We exclude

[6] Llorente et. al. verify that C_2 is larger for companies that are more likely to suffer from information asymmetry – that is, firms with high bid–ask spread, small size, lower analyst following – indicating the dominance of private information (hedging) trades. In a supportive study, Grishchenko et al. (2003) show that C_2 is, on average, larger for firms that are located in countries where information asymmetry problems are more severe, such as countries with poor disclosure requirements or countries that score low on corporate governance characteristics.

financial firms because accounting data for these firms are not comparable with the rest of the sample.

Ownership wedge, WEDGE, is defined as the difference between control rights CONT and cash flow rights CASH of the largest shareholder.

The measure of earnings opacity is based on Leuz et al. (2003) and Bhattacharya et al. (2003). For every firm, we calculate earnings opacity, OPACITY, as −1 times the Spearman correlation between the changes in accruals and the changes in cash flow from operations, both scaled by lagged total assets. Accruals are defined as

$$\mathrm{ACCRUALS}^{c}_{i,t} = \left(\Delta \mathrm{CA}^{c}_{i,t} - \Delta \mathrm{CASH}^{c}_{i,t}\right) - \left(\Delta \mathrm{CL}^{c}_{i,t} - \Delta \mathrm{STD}^{c}_{i,t} - \Delta \mathrm{TP}^{c}_{i,t}\right) - \mathrm{DEP}^{c}_{i,t}, \tag{3}$$

where Δ stands for changes, CA is total current assets, CASH is cash and cash equivalents, CL is current liabilities, STD is short-term debt included in current liabilities, TP is income tax payable, and DEP is depreciation and amortization expense. Operating cash flows are determined by first calculating the accruals component of earnings and then subtracting it from earnings. The data period is from 1992 to 1997; thus each correlation coefficient is based on five data points. Large positive values for OPACITY indicate more earnings opacity.

Firm valuation is measured by Tobin's Q, average from 1996 through 1998. As in Doidge et al. (2003), we define Tobin's Q as the sum of total assets and the market value of equity less book value of equity, over total assets. The market value of equity is the number of common shares outstanding, times the year-end price.

Beny (2005, 2006) constructs an index of insider trading regulation by aggregating individual components of countries' insider trading laws. The original data come from Stamp and Welsh (1996) who provide a comprehensive overview of the key rules relating to insider dealing in 25 countries collected from various written laws. The index is formed by adding 1 if: (1) violation of the insider trading law is a criminal offense; (2) tippees are prohibited from trading on material nonpublic information; (3) insiders are prohibited from tipping outsiders about material nonpublic information and/or encouraging them to trade on such information for personal gain; (4) monetary penalties are proportional to insiders' trading profits; (5) investors have a private right of action. We use this index as a measure of insider trading regulation, INS_REG.

To construct a proxy for the enforcement of insider trading laws, we rely on country statistics collected by Bhattacharya and Daouk (2002), who document the year in which each country first enforced its insider trading laws by prosecuting a violator. Since our explanatory variables are measured in 1996, we define enforcement of insider trading laws, INS_ENF, as a dummy variable, which equals 1 if a country enforced insider trading laws at least once before or during 1996, and 0 otherwise. In our regressions, we use INS_REG and INS_ENF separately as well as their product, which we call INS.

The relation between ownership structure and private information trading can be driven by various country, industry and firm factors. In our regressions, we control for variables that can affect both ownership structure and the incidence of private information trading. La Porta et al. (1998b) show that both cash flow rights and control rights are more concentrated in countries with poor legal environment. According to Grishchenko et al. (2003), there is more trading based on private information in countries with weak investor protection. In our regressions we control for this by including the efficiency of the judicial system, JUDIC, defined in La Porta et al. (1998a).

The negative relation between insider trading restrictions and our informed trading measure may be observed not because insiders are deterred from trading in the presence of restrictions, but because countries that introduce and enforce insider trading restrictions happen to have better

developed and more efficient stock markets where stricter disclosure laws reduce the opportunity for private information trading. Thus we control for the aggregate level of stock market capitalization, MCAP, defined as the logarithm of the value of all listed shares over GDP, annual average from 1990 to 1996.

We control for cash flow ownership, CASH, obtained from Claessens et al. (2002) and Faccio and Lang (2002) to account for the fact that a greater cash flow ownership stake reduces the insider's incentives to trade on private information (Beny, 2006).

Coefficient C_2 in (2) can be influenced by liquidity. Pástor and Stambaugh (2003) show that the less liquid a stock is, the larger is the price impact of trades and the more negative C_2 is. On the other hand, using firm size as a measure of liquidity, Llorente et al. indicate that C_2 is negatively related to firm size. Moreover, according to Maug (2000), insider trading restrictions are most valuable when stock markets are sufficiently liquid because insider trading is more likely to occur in liquid markets. Finally, stocks of firms with lower ownership concentrations tend to be more liquid. For these reasons we include the log of market capitalization in 1996, LMV, to control for liquidity.

Coefficient C_2 can be estimated with greater precision for firms with more time-series observations. To control for this heterogeneity, we include the log of the number of trading periods, LNN, as a control parameter.

Industry dummies, D, are included in regressions to account for differences in asset structure, accounting practices, government regulation, and competitiveness, all of which may affect ownership structure and the incentive to pursue private information trading. We classify two-digit SIC industries into 12 groups as in Campbell (1996).

Controlling shareholders of firms with greater growth opportunities and a higher fraction of intangible assets may have more opportunities to trade on private information. Therefore, we control for firms' investment opportunities, INV_OPP, defined as growth in sales, and R&D expenditures over sales, R&D. These variables are calculated for 1996. Finally, we control for time dummies, T, because our ownership data come from different years 1996, 1997, 1998, and 1999.

To capture investor protection laws and their enforcement, we define the variable PROTECT as the product of anti-director index, taken from La Porta et al. (1998a), and the rule of law.

The description of the main variables and data sources appears in Table 1.

4. Results

In this section we present univariate analysis, the results of multivariate regressions, the event study, and robustness checks.

4.1. Univariate results

Table 2 reports summary statistics, by country, for the primary variables. There is great variation in the average amount of private information trading. The highest is in Philippines (PRIVATE = 0.089), Norway (0.078), and Italy (0.069) and the lowest in South Korea (−0.025), Hong Kong (0.000), and the U.K (0.001). Countries also differ substantially in the degree of insider trading regulation. Norway (INS = 1), Indonesia (2), and Philippines (0) have relatively lax insider trading laws, while South Korea (5), Taiwan (4), and France (4) have strict laws with at least one case of prosecution before or during 1996.

Table 3 reports correlation coefficients. The coefficients indicate that the amount of private information trading is larger for firms with greater ownership wedge and it is lower for firms with more liquid stocks and for firms located in countries with stricter insider trading laws. Moreover,

companies with greater private information trading have more opaque earnings. Given that our measure of private information trading reflects the degree of information asymmetry between informed and uninformed traders, the observed relation between private information trading and earnings opacity is consistent with Bhattacharya et al. (2003) result that earnings management is associated with greater information asymmetry and higher cost of capital.

In Fig. 1, we plot the average amount of private information trading, PRIVATE, against INS, the strictness of insider trading laws. The plot indicates a monotonically decreasing relation between private information trading and strictness of insider trading regulation. The decreasing relation is consistent with Grishchenko et al. (2003), who document that private information trading is prevalent in countries with lax enforcement of insider trading restrictions.

In Fig. 2, we plot the average amount of information based trading, PRIVATE, against WEDGE, the ownership wedge. The graph indicates that, except for cases where the wedge is greater than 0% but less than 10% higher wedge is associated with greater trading on private information. This supports the notion that there is more trading on private information of companies with greater agency problems. The non-monotonic relation points to the need to control for other factors before drawing inference about the relation between private-information trading and ownership wedge. For this we turn to multivariate tests.

4.2. Multivariate tests for private information trading

Specification 4.1 in Table 4 presents the results of a simple OLS regression of private information trading on ownership wedge and strictness of insider trading laws, controlling for cash flow rights. Higher ownership wedge is associated with more private information trading and stricter insider trading laws are associated with less private information trading. This finding is robust to the inclusion of country random-effects, a liquidity measure, log of the number of trading periods, industry dummies and time dummies (specification 4.2).

In specification 4.3, we also find that higher ownership wedge is associated with higher private information trading. This finding seems consistent with the notion that controlling shareholders of firms with high agency costs are more likely to use sensitive private information to obtain trading profits for themselves. Specification 4.3 also shows that stricter insider trading regulation is associated with less private information trading. However, the positive and significant coefficient on the interaction of ownership wedge with insider trading regulation indicates that insider trading regulation is less effective in reducing private information trading when the wedge between ownership and control is higher.

As discussed earlier, we have two potential explanations for this finding. First, controlling shareholders who do not have adequate cash flow rights are less likely to relinquish insider trading profits possibly because they have the incentive and the means to hide illegal insider trading. Second, insider trading restrictions may drive controlling shareholders to seek private benefits through covert expropriation of firms' resources, fostering information asymmetry, which in turn increases the returns to private information trading. The positive and significant coefficient on the interaction of INS and WEDGE provides evidence in support of our argument. These results continue to hold when we control for efficiency of the judicial system, firm investment opportunities and R&D expenditures (specification 4.4).

Based on specification 4.3 in Table 4, the magnitudes of the coefficients indicate that when insider trading laws improve by 1 point (out of 5), the amount of private information trading decreases by 13% relative to the average value of PRIVATE, for the mean value of ownership wedge of 5%. However, for firms with the lowest ownership wedge in our sample, 0% (1st

Table 1
Variables, definitions, and sources

Main variables	Notations	Definitions	Sources
Amount of private information trading	PRIVATE	The amount of private information trading, PRIVATE, is measured by coefficient C_2 in the time-series regression $R^c_{i,t+1}=A^c_i+C^c_{i,2}R^c_{i,t}+C^c_{i,2}R^c_{i,t}V^c_{i,t}+\varepsilon^c_{i,t}$, where i indexes firms, t time, and c country; A is intercept; C_1, C_2 are the regression coefficients; and ε is the error term. Return is defined as $R_{i,t}=\log((P_{i,t}+D_{i,t})/P_{i,t-1})$, where P is closing price, and D are dividends per share. Volume, V, is defined as $V_{i,t}=\log(\mathrm{VOL}_{i,t}/N_{i,t})-1/20\sum_{j=1}^{20}\log(\mathrm{VOL}_{i,t-j}/N_{i,t-j})$, where VOL is the number of shares traded and N the number of shares outstanding. This regression is run using daily data from January 2, 1995 through December 31, 1997. We drop firms that contain fewer than 30 trading days. Higher values of PRIVATE correspond to greater amount of private information trading.	Datastream for closing price, number of shares outstanding, number of shares traded, and Worldscope for dividends.
Cash flow rights	CASH	The share of cash flow rights held by the largest shareholder. The data distinguish between control and cash flow rights using information on firms' pyramid structures, cross-holdings, and dual-class shares. The data are for the end of 1996 for Eastern Asian countries, France, Germany, Switzerland, U.K.; 1997 for Portugal, Spain; 1998 for Norway, Sweden, and 1999 for Austria, Belgium, and Finland.	Claessens et al. (2002) for Eastern Asian firms and Faccio and Lang (2002) for West European firms.
Control rights	CONT	The share of control rights held by the largest shareholder. The data distinguish between control and cash flow rights using information on firms' pyramid structures, cross-holdings, and dual-class shares. To determine effective control a 10% cutoff point is used, above which it is assumed that the largest shareholder has effective control over the intermediate and final corporation. The data are for the end of 1996 for Eastern Asian countries, France, Germany, Switzerland, U.K.; 1997 for Portugal, Spain; 1998 for Norway, Sweden; 1999 for Austria, Belgium, and Finland.	Claessens et al. (2002) for Eastern Asian firms and Faccio and Lang (2002) for West European firms.
Ownership wedge	WEDGE	The difference between control rights (CONT) and cash flow rights (CASH).	
Insider trading regulation	INS_REG	An index formed by aggregating individual components of countries' insider trading laws. The index is constructed by adding 1 if: (1) violation of the insider trading law is a criminal offense; (2) tippees are prohibited from trading on material nonpublic information; (3) insiders are prohibited from tipping outsiders about material nonpublic information and/or encouraging them to trade on such information for personal gain; (4) monetary penalties are proportional to insiders' trading profits; (5) investors have a private right of action. Scale: 0–5. Lower scores indicate less strict insider trading regulation. Original data come from Stamp and Welsh (1996).	Beny (2005, 2006). Original data: Stamp and Welsh (1996).
Insider trading laws enforcement	INS_ENF	A dummy variable that is equal to 1 if a country's insider trading law has been enforced for the first time (i.e., at least once) by the end of 1996.	Bhattacharya and Daouk (2000).
Strictness of insider trading laws	INS	Product of INS_REG and INS_ENF. Scale: 0–5. Lower scores indicate less strict laws against insider trading.	
Earnings opacity	OPACITY	Earnings opacity is a measure of earnings smoothing due to managerial motives. For each firm, OPACITY is defined as −1 times the time-series Spearman correlation coefficient between the changes in accruals and the changes in cash flow, both scaled by lagged total assets. It is based on annual data from 1992 through 1997. Accruals and cash flow are defined in (3) in the text. Higher values of OPACITY indicate greater earnings opacity.	Worldscope.
Valuation	Q	It is 1995 through 1997 average of annual Tobin's Q. Tobin's Q is calculated as the sum of total assets and market value of common stock less book value of equity over total assets. The market value of equity is the number of common shares outstanding times year-end price.	Worldscope.

Investor protection variables			
Investor protection	PROT	The product of investor protection index and the rule of law. The investor protection index aggregates the shareholders' rights. It is formed by adding 1 when: (1) the country allows shareholders to mail their proxy vote to the firm; (2) shareholders are not required to deposit their shares prior to the General Shareholders' Meeting; (3) cumulative voting or proportional representation of minorities in 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%; (6) shareholders have preemptive rights that can only be waived by a shareholders' vote. Scale: 0–6. The rule of law is the assessment of the law and order tradition of the country. It is calculated as the average of monthly values in 1996. The original data are transformed from 0–6 scale to 0–10 scale as in La Porta et al. (1998a). Higher values of PROT indicate better investor protection.	La Porta et al. (1998a) for investor protection index and International Country Risk Guide for the rule of law.
Efficiency of judicial system	JUDIC	Assessment of the efficiency and integrity of the legal environment as it affects business in 1996. Scale: 0–10. Lower scores indicate lower efficiency levels.	Economist Intelligence Unit.
Market capitalization	MCAP	Logarithm of the value of all listed shares over GDP, annual average from 1993 through 1996.	World Bank's 2000 World Development Indicators.
Legal origin	ORIGIN	Legal origin of the company law or commercial code of each country (English common law, French civil law, German civil law, and Scandinavian civil law).	La Porta et al. (1998a).
Control variables			
Liquidity	LMV	Logarithm of firm market value. Market value is the number of shares outstanding times closing price in the end of December 1996.	Worldscope.
Number of trading periods	LNN	Logarithm of the number of periods used to run the regression in (2) in the text to calculate PRIVATE.	Datastream.
Firm size	SIZE	Logarithm of sales in 1996.	Worldscope.
Investment opportunities	INV_OPP	One-year 1995-to-1996 growth rate in net sales. This variable is winsorized at the 1% and 99% levels.	Worldscope.
Research and development expenditures	R&D	Research and development expenditures over sales in 1996.	Worldscope.
Industry dummies	*D*	Industries are grouped across two-digit SICs. They are: petroleum (SIC 13, 29), consumer durables (SIC 30, 36, 37, 50, 55, 57), basic industry (SIC 8, 10, 12, 14, 24, 26, 28, 33), food and tobacco (SIC 20, 21, 54), construction (SIC 15, 16, 17, 32), capital goods (SIC 34, 35, 38, 39), transportation (SIC 40, 41, 42, 44, 45, 47), textiles and trade (SIC 22, 23, 51, 53, 56, 59), services (SIC 7, 73, 75, 80, 82, 83, 87, 96), leisure (SIC 27, 58, 70, 79), unregulated utilities (SIC 48), and regulated utilities (SIC 49).	Campbell (1996).
Year dummies	*T*	Dummy variables for years 1996, 1997, 1998, and 1999.	

Table 2
Summary statistics by country

Country	ORIGIN	PRIVATE, mean	*N*	Firms, PRIVATE	OPACITY, mean	Firms, OPACITY	CONT	CASH	WEDGE	INS_REG	INS_ENF, year	INS
Austria	German	0.0379	42	553	−0.781	36	54.454	47.457	6.997	2	No cases	0
Belgium	French	0.0416	21	618	−0.757	23	37.621	32.335	5.286	3	1994	3
Finland	Scandinavian	0.0426	62	445	−0.700	13	32.643	28.820	3.824	3	1993	3
France	French	0.0253	220	832	−0.769	138	46.290	45.309	0.981	4	1975	4
Germany	German	0.0268	189	711	−0.788	252	46.976	41.202	5.774	3	1995	3
Hong Kong	English	−0.000181	113	432	−0.731	93	33.150	28.920	4.230	3	1994	3
Indonesia	French	0.0610	44	392	−0.791	34	34.773	25.045	9.727	2	1996	2
Italy	French	0.0699	56	719	−0.844	54	51.991	44.177	7.814	3	1996	3
Japan	German	0.0254	744	775	−0.795	498	11.085	7.250	3.835	2	1990	2
Malaysia	English	0.00629	65	591	−0.772	87	33.646	28.738	4.908	3	1996	3
Norway	Scandinavian	0.0781	16	614	−0.541	37	25.434	23.226	2.208	1	1990	1
Philippines	French	0.0891	21	311	−0.533	9	28.000	24.857	3.143	2	No cases	0
Portugal	French	0.0696	15	672	–	–	43.633	40.405	3.228	4	No cases	0
Singapore	English	0.0411	68	612	−0.758	78	29.515	22.412	7.103	4	1978	4
South Korea	German	−0.0246	112	717	−0.665	79	22.893	19.848	3.045	5	1988	5
Spain	French	0.0554	38	811	−0.864	25	28.591	26.654	1.937	4	1998	0
Sweden	Scandinavian	0.0603	57	712	−0.663	43	26.047	19.006	7.041	3	1990	3
Switzerland	German	0.0348	69	654	−0.743	67	40.028	27.639	12.389	3	1995	3
Taiwan	German	0.00429	61	717	−0.751	68	22.705	18.672	4.033	4	1989	4
Thailand	English	0.0658	26	434	−0.561	49	37.931	33.985	3.946	3	1993	3
UK	English	0.00119	150	623	−0.617	54	16.893	15.654	1.239	3	1981	3
Average		0.0387	104.238	616.429	−0.721	86.850	33.538	28.648	4.890	3.048		2.476

This table reports the summary statistics (averages) of main variables by country. Countries are sorted alphabetically. Variable ORIGIN is a country's legal regime; 'PRIVATE, mean' is a country average amount of private information trading; *N* is the average number of trading days used to calculate PRIVATE; "Firms, PRIVATE" records the number of firms in a country for which PRIVATE can be calculated; OPACITY is earnings opacity measure; "Firms, OPACITY" records the number of firms in a country for which OPACITY can be calculated; CONT is control concentration (in % terms); CASH are cash flow rights (in % terms); WEDGE is the difference between CONT and CASH; INS_REG is the index of insider trading regulation; "INS_ENF, year" is the year of the first documented case against insider trading; and INS is the index of the strictness of insider trading laws. Firms that belong to financial industries (SIC 60, 61, 62, 63, 65, 67) are excluded from the sample. Refer to Table 1 for definitions of variables.

Table 3
Correlation coefficients

CASH	WEDGE	INS_REG	INS_ENF	INS	LMV	OPACITY	LNN	INV_OPP	R&D	R&D	Research and development expenditures
0.067 (0.00)	**0.042** (0.05)	**−0.160** (0.00)	**−0.158** (0.00)	**−0.231** (0.00)	**−0.232** (0.00)	**0.053** (0.02)	**−0.056** (0.01)	−0.015 (0.49)	−0.020 (0.36)	PRIVATE	Amount of private information trading
	−0.170 (0.00)	**0.351** (0.00)	**−0.140** (0.00)	**0.216** (0.00)	**−0.338** (0.00)	−0.004 (0.84)	**−0.190** (0.00)	**0.070** (0.00)	−0.0305 (0.16)	CASH	Cash flow rights
		−0.060 (0.01)	0.003 (0.89)	**−0.036** (0.09)	**−0.037** (0.10)	**0.039** (0.10)	**−0.044** (0.04)	**−0.063** (0.00)	−0.015 (0.50)	WEDGE	Ownership wedge
			−0.008 (0.70)	**0.768** (0.00)	**−0.211** (0.00)	−0.027 (0.26)	**0.080** (0.00)	**−0.042** (0.06)	0.001 (0.70)	INS_REG	Insider trading regulation
				0.600 (0.00)	**0.098** (0.00)	−0.015 (0.55)	**0.128** (0.00)	0.0237 (0.28)	0.010 (0.64)	INS_ENF	Insider trading laws enforcement
					−0.126 (0.00)	−0.038 (0.11)	**−0.102** (0.00)	−0.031 (0.16)	0.007 (0.76)	INS	Strictness of insider trading laws
						0.046 (0.06)	**0.433** (0.00)	**0.057** (0.01)	0.028 (0.20)	LMV	Liquidity
							−0.133 (0.00)	−0.007 (0.78)	−0.004 (0.87)	OPACITY	Earnings opacity
								0.045 (0.04)	0.026 (0.24)	LNN	Log of number of trading periods
									0.122 (0.00)	INV_OPP	Investment opportunities

This table reports correlation coefficients between main variables. Numbers in parentheses are probability levels at which the hypothesis of zero correlation can be rejected. Coefficients significant at least at the 10% level (based on two-tailed test) are in bold face. Firms that belong to financial industries (SIC 60, 61, 62, 63, 65, and 67) are excluded from the sample. The sample size ranges from 1559 to 2189 firms depending on the pair of variables under consideration. Refer to Table 1 for definitions of variables. All financial and accounting variables are measured in U.S. dollars.

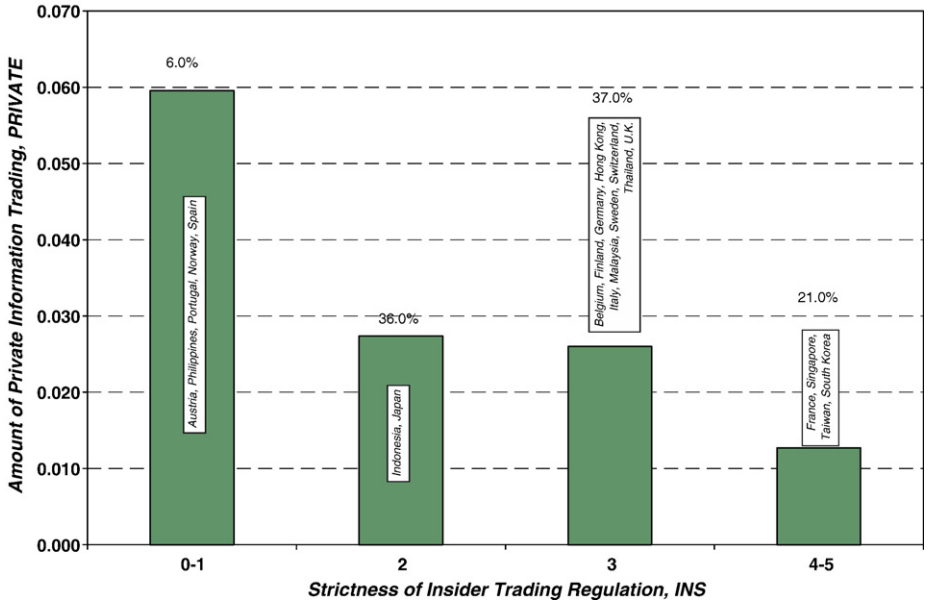

Fig. 1. Average amount of private information trading, PRIVATE, grouped by the strictness of insider trading laws, INS. The height of each bar is the group average of the amount of private information trading. The groups are: INS 0–1 (Austria, Philippines, Portugal, Norway, Spain), INS=2 (Indonesia, Japan); INS=3 (Belgium, Finland, Germany, Hong Kong, Italy, Malaysia, Sweden, Switzerland, Thailand, U.K.); INS=4 or 5 (France, Singapore, Taiwan, South Korea). Higher values for PRIVATE indicate higher amount of private information trading. The graph is based on the sample of 2189 firms from 21 countries. The percentage of observations in a group is listed at the top of each bar.

percentile), the amount of private information trading decreases by 18%, while it actually increases by 2.0% for firms with 60% (99th percentile) ownership wedge. This confirms our hypothesis that although stricter insider trading regulation reduces private information trading, the laws become less effective for high-wedge companies.

4.3. Event study approach

The key conclusion we draw from our cross-section tests on private information trading is that insider trading restrictions reduce the incidence of private information trading but are less effective in doing so when firm agency costs are high. A major concern with this interpretation is that the observed negative relation between insider trading restrictions and PRIVATE may be driven by country and firm characteristics we fail to control for. We present an alternative methodology that effectively addresses both these concerns by performing an event study.

First, we estimate the change in PRIVATE for each firm using the returns and volume data 2 years before and after the first enforcement of insider trading laws. Since Datastream pricing data coverage is scant in the early 90s we consider firms from countries that first enforced insider trading laws after 1993. The sample consists of 3882 firms from 16 countries: Argentina, Australia, Belgium, Chile, Denmark, Greece, Hong Kong, India, Indonesia, Italy, Malaysia, the Netherlands, Spain, Switzerland, and Turkey. We find that, on average, PRIVATE is significantly positive before enforcement and significantly negative after enforcement (Table 5). The decline in PRIVATE after enforcement is significant at the 1% level.

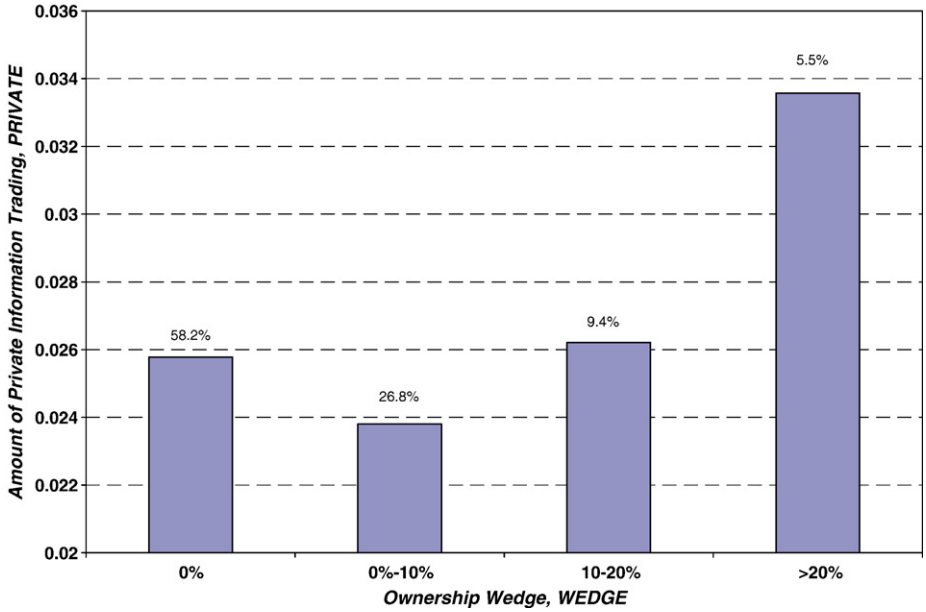

Fig. 2. Average amount of private information trading, PRIVATE, grouped by ownership wedge, WEDGE. The height of each bar is the group average of the amount of private information trading. Higher values for PRIVATE indicate higher amount of private information trading. The graph is based on the sample of 2189 firms from 21 countries. The percentage of observations in a group is listed at the top of each bar.

Second, we examine the relation between firm-level changes in private information trading (ΔPRIVATE) and firm-level ownership wedge (Table 6) after controlling for changes in firm variables.[7] The sample drops to 958 firms from eight countries: Belgium, Germany, Hong Kong, Indonesia, Italy, Malaysia, Spain, and Switzerland. In all specifications, we find that ΔPRIVATE is significantly higher in firms with greater ownership wedge This suggests that although private information trading declines after the enforcement of insider trading regulation, it declines by less in firms with high ownership wedge. Thus, our key results are robust to an event study approach that controls for unobserved country-specific factors.

4.4. Earnings opacity and valuation

We claim that controlling shareholders banned from trading are likely to make up for lost profits by expropriating the firm's resources, particularly when the wedge between ownership and control is high. Individuals who divert firms' resources will attempt to mask the resulting poor performance of the firm, foster information asymmetry and thus, increase the returns to private information trading. Therefore, we expect that firms with high ownership wedge have greater earnings opacity, OPACITY, when strict insider trading restrictions are imposed. To investigate this we use the earnings opacity measure, OPACITY, as the dependent variable in specification 4.5 of Table 4. We find that in countries with stringent insider trading regulation, firms have less opaque earnings. Firms with high ownership

[7] This test relies on the assumption that ownership structure does not change significantly after insider trading laws enforcement. To validate the assumption, we hand-collected information on ownership structure before and after the laws enforcement for a random sub-sample of our firms (20%). We did not discover significant changes.

Table 4
Regressions of amount of private information trading, earnings opacity, and valuation

Dependent variable		Amount of private information trading, PRIVATE				Earnings opacity, OPACITY	Valuation, Q
Specification		4.1	4.2	4.3	4.4	4.5	4.6
Cash flow rights	CASH	**−0.0287** (0.00)	**−0.0226** (0.00)	**−0.0227** (0.00)	**−0.0182** (0.00)	**−0.0445** (0.05)	**0.0305** (0.08)
Ownership wedge	WEDGE	**0.0343** (0.01)	**0.0259** (0.06)	**0.0252** (0.07)	**0.0206** (0.10)	**0.209** (0.03)	**−0.526** (0.07)
Strictness of insider trading laws	INS	**−0.0112** (0.00)	**−0.00991** (0.00)	**−0.00991** (0.00)	**−0.0117** (0.00)	**−0.0115** (0.03)	**0.0469** (0.05)
Interaction term of ownership wedge with strictness of insider trading laws	WEDGE × INS	–	–	**0.0178** (0.00)	**0.0142** (0.00)	**0.0138** (0.04)	**−0.0343** (0.02)
Liquidity	LMV	–	−0.000640 (0.38)	−0.000662 (0.36)	−0.000441 (0.54)	**−0.00796** (0.10)	**0.0712** (0.00)
Log of number of trading periods	LNN	–	**−0.00691** (0.02)	**−0.00682** (0.02)	−0.00487 (0.11)	–	0.0320 (0.65)
Industry dummies	D	No	Yes	Yes	Yes	Yes	Yes
Time dummies	T	No	Yes	Yes	Yes	Yes	Yes
Market capitalization	MCAP	–	–	–	**−0.00375** (0.00)	**−0.0150** (0.00)	**0.0496** (0.06)
Investment opportunities	INV_OPP	–	–	–	0.00282 (0.51)	0.0439 (0.25)	0.0732097 (0.42)
Efficiency of judicial system	JUDIC	–	–	–	**−0.00413** (0.06)	**−0.0331** (0.10)	**0.00961** (0.05)
Research and development expenditures	R&D	–	–	–	−0.00170 (0.52)	0.000880 (0.50)	0.000125 (0.28)
Wald test statistics of overall significance		**54.920** (0.00)	**206.810** (0.00)	**206.900** (0.00)	**241.170** (0.00)	**48.130** (0.00)	**45.790** (0.00)
Regression R^2		0.071	0.092	0.095	0.106	0.078	0.029
Number of firms		2189	2062	2062	2059	1706	1819
Breusch–Pagan Test		–	**203.430** (0.00)	**203.620** (0.00)	**178.630** (0.00)	**120.30** (0.00)	**788.910** (0.00)

This table reports the results of country-random effects regressions (specifications 4.2–4.6):

$$\text{PRIVATE}_i^c \quad \text{or} \quad \text{OPACITY}_i^c \quad \text{or} \quad Q_i^c = \alpha + \beta_1 \text{CASH}_i^c + \beta_2 \text{WEDGE}_i^c + \beta_3 \text{INS}^c + \gamma \text{WEDGE}_i^c * \text{INS}^c + \sum_{k=1}^{K} \delta_k Z_{k,i}^c + \varepsilon_i^c,$$

where c indexes countries and i indexes firms. Variable α is a constant (coefficient is not reported), $E[\varepsilon_i^c]=0$, $E[\varepsilon_i^c,\varepsilon_j^c]\neq 0 \quad \forall i$ and j, and E is the expectation operator. Specification 4.1 is based on OLS regression. The dependent variables are PRIVATE, the amount of private information trading (specifications 4.1–4.4), OPACITY, earnings opacity (specification 4.5), and Tobin's Q (specification 4.6). Variable CASH is cash flow rights; WEDGE is ownership wedge; INS is the strictness of insider trading laws; and WEDGE × INS is the interaction term of control concentration with the strictness of insider trading laws. Control variables, Z's, are: liquidity, LMV (specifications 4.2–4.6); log of the number of trading periods, LNN (specifications 4.2–4.4 and 4.6); industry dummies, D (specifications 4.2–4.6, coefficients are not reported); time dummies, T (specifications 4.2–4.6, coefficients are not reported); market capitalization, MCAP (specifications 4.4–4.6), investment opportunities, INV_OPP (specifications 4.4–4.6; it is winsorized at the 1% and 99% levels); and research and development expenditures, R&D (specifications 4.4–4.6). All financial and accounting variables are measured in U.S. dollars. Numbers in parentheses are probability levels at which the null hypothesis of zero coefficient can be rejected. Coefficients significant at least at the 10% level (based on two-tailed test) are in boldface. Firms that belong to financial industries (SIC 60, 61, 62, 63, 65, 67) are excluded from the sample. We drop firms from the sample if their measure of private information trading is based on fewer than 30 trading days. If all variables, except R&D expenditures, are available, we set R&D expenditures to zero. At the bottom of the table we report the results of the Breusch–Pagan test that the variance of the random effects is zero. In specification 4.1 we report the F-statistics of overall significance instead of Wald test statistics. Refer to Table 1 for definitions of variables.

Table 5
Mean comparison test of private information trading before and after the first enforcement of insider trading laws

$N=3882$	Mean	S.D.	t-stat (p-value)
PRIVATE before enforcement	0.00674	0.00192	**35.030** (0.00)
PRIVATE after enforcement	−0.0315	0.00205	**−51.080** (0.00)
Difference (after − before)	−0.0383	0.000749	**12.080** (0.00)

This table reports the results of the mean comparison test of private information trading before and after the first enforcement of insider trading laws. PRIVATE is the measure of the amount of private information trading. 'PRIVATE before (after)' enforcement is calculated using the available return and volume data 2 years before (after) the first year of insider trading laws enforcement. The sample consists of 3882 firms from 16 countries that enforced insider trading laws after 1993 (Argentina, Australia, Belgium, Chile, Denmark, Germany, Greece, Hong Kong, India, Indonesia, Italy, Malaysia, the Netherlands, Spain, Switzerland, Turkey). The number in parentheses is the probability levels at which the null hypothesis of equal means can be rejected. We drop firms from the sample if their measure of private information trading is based on fewer than 30 trading days.

wedge have more opaque earnings.[8] Moreover, ownership wedge is associated with even greater opacity in countries with stricter insider trading laws. This result is consistent with the notion that the quality of information provided to the public becomes lower when strict insider trading restrictions are imposed on firms with higher ownership wedge.

If expropriation by insiders destroys corporate value, we expect a reduction in firm value for high-wedge firms when insider trading regulation is stringent. According to specification 4.6 of Table 4, firms are valued lower in lax insider trading regimes. As expected, firm value is lower when agency costs, as measured by the ownership wedge, are higher. These companies are valued even lower in strict insider trading regulation countries.

4.5. Investor protection

If our interpretation is correct, the interaction of ownership wedge with insider trading restrictions should be associated with higher private information trading only in countries where insiders find it relatively easy to resort to expropriation. That is, in countries with poor investor protection standards. Thus, as an additional test we split the sample into low- and high-investor protection countries and running our regressions for each sub-sample.[9]

The results for PRIVATE, OPACITY, and Q as dependent variables are presented in Table 7. Panel A (low-investor protection sub-sample) shows, as predicted, that the coefficient on insider trading restrictions is significantly negative for PRIVATE and OPACITY and positive for Q. More importantly, the coefficient on the interaction of insider trading with ownership wedge is significantly positive for PRIVATE and OPACITY and negative for Q.

In the high-investor protection sub-sample (Panel B), while the coefficient on insider trading restrictions is still negative (positive) and significant for PRIVATE (Q) and insignificant for OPACITY, the interaction term is now insignificant in all specifications. This implies that in countries where shareholder rights are well protected, insider trading regulation unambiguously reduces private information trading and increases firm value. However, in countries where minority shareholder rights are not protected adequately, private information trading, earnings opacity, and valuation may remain unchanged in the presence of insider trading restrictions.

[8] This finding is in line with Haw et al. (2004) who show that there is greater earnings management in companies where divergence between control and cash flows rights is higher.

[9] The low- (high-) investor protection sub-sample consists of firms with investor protection score, PROTECT, lower (higher) than the sample median of 33.3.

Table 6
Regressions of the change in the amount of private information trading

Dependent variable		Change in the amount of private information trading, ΔPRIVATE		
Specification		6.1	6.2	6.3
Cash flow rights	CASH	−0.0349 (0.66)	−0.0176 (0.84)	−0.0268 (0.76)
Ownership wedge	WEDGE	**0.0136** (0.02)	**0.0218** (0.03)	**0.0193** (0.03)
Change in liquidity	ΔLMV	–	**0.0000363** (0.04)	**0.000154** (0.09)
Change in logs of number of trading periods	ΔLNN	–	−0.00411 (0.19)	−0.00115 (0.18)
Change in investment opportunities	ΔINV_OPP	–	–	**−0.0142** (0.03)
Change in research and development expenditures	ΔR&D	–	–	−0.00185 (0.70)
F-test statistics of overall significance		**3.263** (0.00)	**4.820** (0.00)	**5.120** (0.00)
Regression R^2		0.020	0.025	0.027
Number of firms		965	620	513

This table reports the results of OLS regressions:

$$\Delta\text{PRIVATE}_i^c = \alpha + \beta_1 \text{CASH}_i^c + \beta_2 \text{WEDGE}_i^c + \sum_{k=1}^{K} \delta_k \Delta Z_{k,i}^c + \varepsilon_i^c,$$

where c indexes countries and i indexes firms. Variable α is a constant (coefficient is not reported). In all specifications, the dependent variable is ΔPRIVATE, the change in the amount of private information trading (the value before minus the value after the first enforcement of insider trading laws). PRIVATE before (after) enforcement is calculated using the available return and volume data 2 years before (after) the first year of insider trading laws enforcement. Variables CASH and WEDGE are cash flow rights and ownership wedge, respectively. Control variables, Z's, are: change in liquidity, ΔLMV (specifications 6.2 and 6.3); change in the log of the number of trading periods, ΔLNN (specifications 6.2 and 6.3); change in investment opportunities, INV_OPP (specification 6.3); and change in research and development expenditures, ΔR&D (specification 6.3). All financial and accounting variables are measured in U.S. dollars. Numbers in parentheses are probability levels at which the null hypothesis of zero coefficient can be rejected. Coefficients significant at least at the 10% level (based on two-tailed test) are in boldface. Firms that belong to financial industries (SIC 60, 61, 62, 63, 65, 67) are excluded from the sample. We drop firms from the sample if their measure of private information trading is estimated with fewer than 30 trading days. If all variables, except R&D expenditures, are available, we set R&D expenditures to zero. Refer to Table 1 for definitions of variables. The sample consists of 965 firms from 8 countries that enforced insider trading laws after 1993 (Belgium, Germany, Hong Kong, Indonesia, Italy, Malaysia, Spain, Switzerland) for which the data on independent variables are available.

Taken together, these results validate our suggestion that in the presence of insider trading restrictions, controlling shareholders substitute towards covert expropriation, provided agency costs are sufficiently high and investor protection low.

It can be argued that our results are driven by the possibility that countries with high-investor protection standards are also the ones that enforce insider trading laws. That is, insider trading laws are more effective in countries with high-investor protection standards simply because these countries happen to be the ones that also enforce the existing insider trading rules. However, this alternative argument cannot explain away our findings because the coefficient on INS is negative and significant in both the high- and low-investor protection sub-samples. This suggests that even in low-investor protection countries, the enforcement of insider trading regulation is sufficient to put a downward pressure on private information trading.

4.6. Robustness checks

Our results are robust to endogeneity problem, alternative regression specifications and definitions of main variables, and outliers. That is, the regression coefficients generate very similar patterns of signs and statistical significance to those reported in Tables 4–7.

Table 7
Regressions of amount of private information trading, earnings opacity, and valuation run for high- and low-investor protection sub-samples

Specification		7.1	7.2	7.3	7.4	7.5	7.6
Dependent variable		PRIVATE	OPACITY	*Q*	PRIVATE	OPACITY	*Q*
		Panel A: Low-investor protection sub-sample, PROT ≤ 33.3 (sample median)			Panel B: High-investor protection sub-sample, PROT > 33.3 (sample median)		
Cash flow rights	CASH	−0.00209 (0.27)	0.0414 (0.44)	**0.0571** (0.02)	−0.00628 (0.22)	−0.0273 (0.80)	**0.251** (0.03)
Ownership wedge	WEDGE	**0.0254** (0.00)	**0.197** (0.10)	−0.135 (0.56)	**0.0184** (0.10)	−0.0881 (0.69)	**−0.261** (0.00)
Strictness of insider trading laws	INS	**−0.0123** (0.00)	**−0.0110** (0.03)	**0.0463** (0.01)	**−0.00911** (0.00)	−0.0270 (0.24)	**0.0396** (0.00)
Interaction term of ownership wedge with strictness of insider trading laws	WEDGE × INS	**0.0108** (0.04)	**0.0146** (0.03)	**−0.0314** (0.10)	0.0000549 (0.71)	−0.166 (0.43)	0.00281 (0.21)
Liquidity	LMV	−0.0008287 (0.33)	−0.00441 (0.55)	**0.139** (0.00)	0.000378 (0.72)	−0.00760 (0.34)	0.0108 (0.67)
Log of number of trading periods	LNN	−0.00518 (0.24)	–	−0.0852 (0.16)	−0.00662 (0.19)	–	0.156 (0.17)
Industry dummies	*D*	Yes	Yes	Yes	Yes	Yes	Yes
Time dummies	*T*	Yes	Yes	Yes	Yes	Yes	Yes
Market capitalization	MCAP	−0.00179 (0.21)	**−0.0160** (0.03)	**0.0236** (0.04)	−0.00147 (0.60)	−0.0167 (0.69)	−0.0036 (0.12)
Efficiency of judicial system	JUDIC	**0.00380** (0.05)	**−0.0380** (0.08)	**0.0101** (0.03)	0.00118 (0.17)	−0.0211 (0.22)	0.00618 (0.25)
Investment opportunities	INV_OPP	0.00219 (0.68)	−0.0124 (0.82)	**0.261** (0.00)	**−0.0118** (0.07)	−0.0674 (0.22)	0.0845 (0.58)
Research and development expenditures	R&D	**−0.000445** (0.00)	0.103 (0.83)	**0.0000149** (0.06)	−0.000818 (0.78)	−0.000422 (0.98)	**0.000242** (0.00)
Wald test statistics of overall significance		**111.820** (0.00)	**33.180** (0.05)	**153.760** (0.00)	**36.610** (0.00)	**35.270** (0.04)	**149.320** (0.00)
Regression R^2		0.035	0.039	0.058	0.031	0.0402	0.032
Number of firms		896	840	827	1163	866	992
Breusch–Pagan Test		**43.670** (0.00)	**50.000** (0.00)	**8.780** (0.00)	**9.070** (0.00)	**50.300** (0.00)	**59.320** (0.00)

This table reports the results of country-random effects regressions:

$$\text{PRIVATE}_i^c \quad \text{or} \quad \text{OPACITY}_i^c \quad \text{or} \quad Q_i^c = \alpha + \beta_1 \text{CASH}_i^c + \beta_2 \text{WEDGE}_i^c + \beta_3 \text{INS}^c + \gamma \text{WEDGE}_i^c * \text{INS}^c + \sum_{k=1}^{K} \delta_k Z_{k,i}^c + \varepsilon_i^c,$$

where c indexes countries and i indexes firms. Variable α is a constant (coefficient is not reported), $E[\varepsilon_i^c]=0$, $E[\varepsilon_i^c,\varepsilon_j^c]\neq 0 \quad \forall i$ and j, and E is the expectation operator. The dependent variables are PRIVATE, the amount of private information trading (specifications 7.1 and 7.4), earnings opacity, OPACITY (specifications 7.2 and 7.5) and Tobin's *Q* (specifications 7.3 and 7.6). Variable CASH is cash flow rights; WEDGE is ownership wedge; INS is the strictness of insider trading laws; and WEDGE × INS is the interaction term of control concentration with the strictness of insider trading laws. Control variables, *Z*'s, are: liquidity, LMV; log of the number of trading periods, LNN; industry dummies, *D* (coefficients are not reported); time dummies, *T* (coefficients are not reported); market capitalization, MCAP, investment opportunities, INV_OPP (it is winsorized at the 1% and 99% levels); and research and development expenditures, R&D. All financial and accounting variables are measured in U.S. dollars. In Panel A, the sample consists of firms from low-investor protection countries (PROT ≤ 33.3, sample median). In Panel B, the sample consists of firms from high-investor protection countries (PROT > 33.3, sample median). Numbers in parentheses are probability levels at which the null hypothesis of zero coefficient can be rejected. Coefficients significant at least at the 10% level (based on two-tailed test) are in boldface. Firms that belong to financial industries (SIC 60, 61, 62, 63, 65, 67) are excluded from the sample. We drop firms from the sample if their measure of private information trading is based on fewer than 30 trading days. If all variables, except R&D expenditures, are available, we set R&D expenditures to zero. At the bottom of the table we report the results of the Breusch–Pagan test that the variance of the random effects is zero. Refer to Table 1 for definitions of variables.

The insider trading laws enforcement variable can be a noisy measure because the lack of prosecution prior to 1996 could indicate that trading restrictions were strict enough to deter people from violating them. Thus, as a robustness check, we use the rule of law index (a measure of the law and order tradition of the country) as a proxy for INS_ENF. The rule of law index is from the International Country Risk Guide and is calculated as a monthly average in 1996. Using this variable as a proxy for enforcement does not change our results.

In addition to the event study approach described in Section 4.3, we address endogeneity by using legal origin dummies, ORIGIN, defined in La Porta et al. (1998a), as instruments for the ownership variables. La Porta et al. (1998b) show that legal origin shapes firms' ownership structure. However, there is no a priori reason to believe that legal origin affects the amount of private information trading, other than through ownership structure and the variables we already control for such as the quality of legal environment.

Table 8 repeats the regressions of Table 4 using legal origin dummies as instruments for WEDGE, CASH, and WEDGE × INS, which are assumed to be endogenous. It is evident from the instrumental variable regressions that the results described earlier still hold for PRIVATE and Q, and are weaker for OPACITY.[10] Greater ownership wedge is associated with more private information trading and lower valuation. Insider trading regulation reduces information trading and increases valuation, but is less successful in doing so when ownership wedge is high.

As an alternative measure of information trading we use the degree of stock prices asynchronicity developed in Morck et al. (2000), and Durnev et al. (2004). They show that when market return has low explanatory power with respect to individual firm return (high degree of asynchronicity) stock prices are more informative.

To calculate stock returns asynchronicity we follow Morck et al. (2000) and decompose the variation in local individual stock returns into two components: unexplained (residual) sum of squares and explained (by local market index and U.S. index) sum of squares. To perform the decomposition we first run the regression,

$$r^c_{i,t} = \alpha^c_i + \beta^c_{1,i} r^c_{m,t} \beta^c_{2,i} r^{\mathrm{US}}_{i,t} + \varepsilon^c_{i,t}, \tag{4}$$

where $r^c_{i,t}$ is firm i's weekly return, $r^c_{m,t}$ is local market return, and $r^{\mathrm{US}}_{m,t}$ is U.S. market return. All returns are expressed in local currencies. Local market and U.S. indexes are value-weighted and they exclude the firm in question to avoid spurious correlation between individual returns and indexes for markets with few firms. We define stock returns asynchronicity measure, ASYN_i, as the logarithmic transformation of one minus the coefficient of determination of the above regression, $\mathrm{ASYN}^c_i = \ln\left(\frac{1-R^{2,c}_i}{R^{2,c}_i}\right)$, which is, by construction, equal to the difference between the log of unexplained and explained sums of squares. High values of ASYN mean that individual stock returns move mostly independently of market indexes which, according to Morck et al. (2000), Durnev et al. (2003), and Durnev et al. (2004), can reflect more informative stock prices.[11]

We repeat regressions of Table 4 with ASYN as the dependent variable and report the results in Table 9. The coefficients on ownership wedge and insider trading regulation are of expected sign

[10] At the bottom of Table 7 we report the results of Durbin–Wu–Hausman test of endogeneity. The test indicates that ownership variables are endogenous.

[11] Interestingly, PRIVATE and ASYN are only weakly correlated. The low correlation can reflect the fact that the two variables are measuring different types of informational efficiencies of stock prices. While PRIVATE is an aggregate proxy for information asymmetry between informed and uninformed traders, ASYN incorporates the speed of information incorporation into stock prices. Thus, the two measures are not directly comparable.

Table 8
Two-stage least squares regressions of amount of private information trading, earnings opacity, and valuation

Dependent variable		Amount of private information trading, PRIVATE				Earnings opacity, OPACITY	Valuation, Q
Specification		8.1	8.2	8.3	8.4	8.5	8.6
Cash flow rights	CASH	**−0.250** (0.00)	**−0.101** (0.00)	−0.792 (0.31)	**−0.319** (0.09)	−0.509 (0.30)	**16.138** (0.40)
Ownership wedge	WEDGE	**0.239** (0.05)	**0.428** (0.00)	**0.306** (0.00)	**0.546** (0.08)	**0.839** (0.09)	**−3.097** (0.00)
Strictness of insider trading laws	INS	**−0.0148** (0.00)	**−0.0164** (0.00)	**−0.0222** (0.03)	**−0.108** (0.08)	−0.151 (0.40)	5.883 (0.41)
Interaction term of ownership wedge with strictness of insider trading laws	WEDGE × INS	–	–	**0.411** (0.01)	**0.184** (0.08)	−0.231 (0.17)	**−1.184** (0.04)
Liquidity	LMV	–	0.00121 (0.33)	0.00712 (0.45)	0.00150 (0.65)	−0.177 (0.67)	**0.0389** (0.07)
Log of number of trading periods	LNN	–	−0.00484 (0.28)	0.101 (0.40)	0.0408 (0.23)	–	−2.937 (0.38)
Industry dummies	D	No	Yes	Yes	Yes	Yes	Yes
Time dummies	T	No	Yes	Yes	Yes	Yes	Yes
Market capitalization	MCAP	–	–	–	**−0.00625** (0.08)	−0.0265 (0.59)	0.234 (0.50)
Efficiency of judicial system	JUDIC				**−0.00308** (0.08)	**−0.108** (0.10)	**0.0162** (0.05)
Investment opportunities	INV_OPP	–	–	–	**−0.0322** (0.10)	−0.519 (0.68)	1.809 (0.40)
Assets intangibility	R&D	–	–	–	**−0.000515** (0.05)	0.109 (0.73)	0.000240 (0.42)
F-test statistics of overall significance		**5.580** (0.00)	**8.780** (0.00)	**7.340** (0.00)	**2.480** (0.05)	**2.660** (0.05)	**4.120** (0.00)
Number of firms		2189	2062	2062	2059	1706	1819
Durbin–Wu–Hausman test of endogeneity		**46.340** (0.00)	**17.190** (0.00)	**17.210** (0.00)	**15.440** (0.00)	**16.060** (0.00)	**19.200** (0.00)

This table reports the results of the following two-stage least squares regression:

$$\text{PRIVATE}_i^c \quad \text{or} \quad \text{OPACITY}_i^c \quad \text{or} \quad Q_i^c = \alpha + \beta_1 \text{CASH}_i^c + \beta_2 \text{WEDGE}_i^c + \beta_3 \text{INS}^c + \gamma \text{WEDGE}_i^c * \text{INS}^c + \sum_{k=1}^{K} \delta_k Z_{k,i}^c + \varepsilon_i^c,$$

where legal origin dummies, ORIGIN, are used as instruments for ownership variables. The ownership variables, which are assumed to be endogenous, are: cash flow rights, CASH, ownership wedge, WEDGE, and the interaction of ownership wedge with the strictness of insider trading regulation, WEDGE × INS. In those regressions c indexes countries, i indexes firms, and α is a constant (coefficient is not reported). The rest of the variables are: PRIVATE, the amount of private information trading; OPACITY, earnings opacity; Tobin's Q, Q; INS is the strictness of insider trading regulation; liquidity, LMV; log of the number of trading periods, LNN; industry dummies, D (coefficients are not reported); time dummies, T (coefficients are not reported); market capitalization, MCAP, investment opportunities, INV_OPP (winsorized at the 1% and 99% levels); and research and development expenditures, R&D. All financial and accounting variables are measured in U.S. dollars. Numbers in parentheses are probability levels at which the null hypothesis of zero coefficient can be rejected. Coefficients significant at least at the 10% level (based on two-tailed test) are in boldface. Firms that belong to financial industries (SIC 60, 61, 62, 63, 65, 67) are excluded from the sample. We drop firms from the sample if their measure of private information trading is based on fewer than 30 trading days. If all variables, except R&D expenditures, are available, we set R&D expenditures to zero. At the bottom of the table we report the results of the Durbin–Wu–Hausman test of endogeneity. To perform this test we first regress the endogenous variables (WEDGE and CASH in specifications 8.1–8.6, and also WEDGE × INS in specifications 8.3–8.5 and 8.6) on the set of exogenous variables, collect the fitted values of residuals, $\varepsilon_{\text{CASH}}$, $\varepsilon_{\text{WEDGE}}$, and $\varepsilon_{\text{WEDGE} \times \text{INS}}$, and use them as additional variables in the base regression. High values of the F-test of their joint significance indicate the endogeneity of CASH, WEDGE and WEDGE × INS. Refer to Table 1 for definitions of variables.

Table 9
Regressions of alternative measure of private information trading (returns asynchronicity)

Dependent variable		Returns asynchronicity, ASYN			
Specification		9.1	9.2	9.3	9.4
Cash flow rights	CASH	**0.277**	**0.397**	**0.397**	**0.441**
		(0.00)	(0.02)	(0.02)	(0.00)
Ownership wedge	WEDGE	**−0.174**	**−0.155**	**−0.112**	**−0.267**
		(0.05)	(0.05)	(0.09)	(0.01)
Strictness of insider trading laws	INS	**0.115**	**0.110**	**0.173**	**0.145**
		(0.00)	(0.03)	(0.08)	(0.10)
Interaction term of ownership wedge with strictness of insider trading laws	WEDGE×INS	–	–	**−0.0942**	−0.0840
				(0.05)	(0.15)
Liquidity	LMV	–	**−0.293**	**−0.293**	**−0.285**
			(0.00)	(0.00)	(0.04)
Log of number of trading periods	LNN	–	**0.239**	**0.244**	**0.360**
			(0.02)	(0.02)	(0.00)
Industry dummies	*D*	No	Yes	Yes	Yes
Time dummies	*T*	No	Yes	Yes	Yes
Market capitalization	MCAP	–	–	–	**0.00338**
					(0.00)
Investment opportunities	INV_OPP	–	–	–	**0.357**
					(0.00)
Research and development expenditures	R&D	–	–	–	0.222
					(0.25)
Wald test statistics of overall significance		**13.230**	**560.170**	**561.130**	**451.650**
		(0.00)	(0.00)	(0.00)	(0.00)
Regression R^2		0.089	0.153	0.153	0.189
Number of firms		2048	1964	1964	1922
Breusch–Pagan Test		–	**2635.190**	**2598.850**	**2451.770**
			(0.00)	(0.00)	(0.00)

This table reports the results of country-random effects regressions (specifications 9.2–9.4):

$$\mathrm{ASYN}_i^c = \alpha + \beta_1 \mathrm{CASH}_i^c + \beta_2 \mathrm{WEDGE}_i^c + \beta_3 \mathrm{INS}^c + \gamma \mathrm{WEDGE}_i^c * \mathrm{INS}^c + \sum_{k=1}^{K} \delta_k Z_{k,i}^c + \varepsilon_i^c,$$

where c indexes countries and i indexes firms. Variable α is a constant (coefficient is not reported), $E[\varepsilon_i^c]=0$, $E[\varepsilon_i^c,\varepsilon_j^c]\neq 0 \quad \forall i$ and j, and E is the expectation operator. Specification 9.1 is based on OLS regression. The dependent variable is ASYN, stock returns asynchronicity, calculated as the logarithmic transformation of one minus the coefficient of determination from the regression of firm weekly return on value-weighted local market index, and value-weighted U.S. market index (all returns are measured in local currencies). Variable CASH is cash flow rights; WEDGE is ownership wedge; INS is the strictness of insider trading laws; and WEDGE×INS is the interaction term of ownership wedge with the strictness of insider trading laws. Control variables, *Z*'s, are: liquidity, LMV (specifications 9.2–9.4); log of the number of trading periods, LNN (specifications 9.2–9.4); industry dummies, *D* (specifications 9.2–9.4, coefficients are not reported); time dummies, *T* (specifications 9.2–9.4, coefficients are not reported); market capitalization, MCAP (specifications 9.4), investment opportunities, INV_OPP (specifications 9.4; it is winsorized at the 1% and 99% levels); and research and development expenditures, R&D (specifications 9.4). All financial and accounting variables are measured in U.S. dollars. Numbers in parentheses are probability levels at which the null hypothesis of zero coefficient can be rejected. Coefficients significant at least at the 10% level (based on two-tailed test) are in boldface. Firms that belong to financial industries (SIC 60, 61, 62, 63, 65, 67) are excluded from the sample. We drop firms from the sample if their measure of returns asynchronicity is based on fewer than 30 trading days. If all variables, except R&D expenditures, are available, we set R&D expenditures to zero. At the bottom of the table we report the results of the Breusch–Pagan test that the variance of the random effects is zero. In specification 9.1 we report the *F*-statistics of overall significance instead of Wald test statistics.

and significant across all specifications—lower agency costs and stricter insider trading regulation are associated with more asynchronous stock prices. The result on the interaction term is weaker. It is significant at 5% level in one out of two specifications.

The strictness of insider trading laws, INS, is measured by the product of the insider trading index, INS_REG, and the insider trading law enforcement dummy variable, INS_ENF. Since previous studies (Beny, 2005; Bhattacharya and Daouk, 2002) use either the insider trading index or the insider trading enforcement variable, we check the robustness of our findings by including INS_REG and INS_ENF and their interaction terms with WEDGE separately. Although we do not report the results, the coefficients on INS_REG and INS_ENF are significantly negative suggesting that both regulation and its enforcement are associated with lower private information trading. The coefficients on the interaction terms of INS_REG and INS_ENF with ownership wedge are both positive and significant. When we use the rule of law as a proxy for INS_ENF, the coefficient on INS_ENF is negative and significant and its interaction with WEDGE is positive and significant. These findings continue to suggest that when the ownership wedge of large shareholders is higher, both insider trading regulation and its enforcement are less effective at reducing private information trading.

As a robustness check, we define investor protection index, PROTECT, with the legality index, as in Durnev and Kim (2005). The legality index is constructed by combining investor and creditor protections, the efficiency of the judicial system, rule of law, absence of corruption, risk of expropriation, and risk of contract repudiation (see La Porta et al., 1998a, for definitions of these variables and Berkowitz et al., 2003, for methodology). The main results remain unchanged.

Our results also survive the inclusion of a long list of additional control variables that proxy for country governance and disclosure standards, economic development, level of corruption, and trading costs, all of which can influence the intensity of private information trading. Specifically, we control for the level of economic development measured by GDP per capita, the nation's quality of accounting standards defined in La Porta et al. (1998a), corruption index from the Transparency International, country aggregate stock market turnover, Price Waterhouse Coopers' opacity index, and Elkins/McSherry index of trading costs (Domowitz et al., 2001). Our results do not change when we include these additional controls together or separately. In the interest of brevity, we do not report the results with these additional control variables.

Doidge et al. (2003) document that firms that issue ADRs receive higher valuation. Lang et al. (2003) suggest that cross-listing enhances firm value through its effect on the firm's information environment. Jain (2005) shows that electronic trading, compared to floor trading, enhances liquidity and informativeness of stock markets. We do not control for ADRs or electronic trading because our sample includes only non-ADR stocks from exchanges that have both floor trading and electronic trading systems in 1996.

Our results also hold if we repeat the analyses after dropping Japanese firms because they comprise 29% of the sample or if we include a dummy variable for firms from East Asian countries. Finally, our findings do not change if we winsorize all variables at the 1% and 99% levels to reduce the impact of outliers.

5. Conclusion

In the past decade, most stock markets around the world have introduced rules against insider trading. In many countries, these rules have been enforced with the prosecution of those violating the laws. The objective of insider trading restrictions is purportedly to improve the integrity and liquidity of stock markets by encouraging ordinary investors to participate. Insider trading

restrictions are intended to reduce the adverse selection problem facing uninformed investors by limiting the incidence of private information trading.

This paper examines the effectiveness of insider trading restrictions in reducing private information trading. The results indicate that insider trading restrictions become less effective if firm agency costs measured by ownership wedge are high and investor protection standards are weak. We hypothesize that controlling shareholders banned from insider trading may be able to make up for the loss in trading profits by expropriating firm resources if the protection given to minority shareholders is low. The opaque informational environment that often accompanies covert activities of controlling shareholders can, in turn, increase the returns to private information trading.

Using cross-sectional regressions and an event study we find that on average insider trading restrictions reduce the amount of private information trading. However, a wedge between ownership and control makes insider trading restrictions less effective in reducing private information trading. We also find that in the presence of insider trading restrictions, firms with high ownership wedge have more opaque earnings, and receive lower valuation. In fact, for high levels of ownership wedge, insider trading restrictions may actually increase trading on private information. These results support our conjecture that imposing insider trading restrictions on firms with a high ownership wedge increases private information trading because controlling shareholders expropriate and hide more in the presence of stricter insider trading laws. Our results appear to be robust to alternative definitions of main variables, endogeneity and a battery of additional control variables.

If the primary objective of insider trading restrictions is to encourage the uninformed public to participate in the market, then regulators need to be wary of the effect insider trading restrictions have on the aggregate level of private information trading. When agency costs are high, the restrictions may not make uninformed investors better off, unless the regulator ensures a concomitant improvement in investor protection standards. Countries that do not protect minority shareholders adequately but have strict laws against insider trading should ensure stronger investor protection standards that would make expropriation and manipulation of financial statements harder. Otherwise, the costs of introducing and enforcing insider trading restrictions may not be worthwhile.

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