Three essays on international capital markets

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THREE ESSAYS ON INTERNATIONAL CAPITAL MARKETS

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Summary

The purpose of this thesis is to document and understand the cross-country differences in institutional characteristics and firm attributes in the context of international capital markets. The thesis consists of three essays.

I start by performing a cross-country analysis of the relationship between corporate governance and the amount of private information in stock price. Existing evidence suggests that investor protection and transparency associated with strong corporate governance encourage informed trading, thereby facilitating financial market efficiency. Using firm-level data from 22 developed countries, I find that firm-specific stock return variation, a measure of stock price informativeness, increases with the quality of a firm's corporate governance. This finding is more pronounced among companies with low firm-level governance. The results show that anti-takeover and audit ratings, while not board quality, are positively related to stock price informativeness. In countries with poor legal environment, company corporate governance plays a more significant role in increasing stock price informativeness. The market views a firm's commitment to better corporate governance favorably in countries with poor legal environment.

The second essay performs an event study to examine whether and how corporate governance affects market behavior around annual earnings announcements in 23 developed countries worldwide. Using detailed corporate governance data for the period 2002-2005, I find that companies that adopt better corporate governance practices experience stronger market price reactions. Evidence therefore suggests that effective corporate governance gives credibility to accounting earnings, thereby conveying more informative earnings announcements to the public. Furthermore, the results show that firm governance practices are at least as important as legal regulations in explaining market reactions around the announcements. Particularly, regulations mandating financial disclosures are conducive to the informativeness of

earnings announcements as perceived by investors.

Finally, I study the impact of geographic proximity on the selection of lead underwriter in the international bond market on a sample of 3,982 international bond issues from 1999 to 2005. As predicted by the proximity relevance hypothesis, I find that proximate banks are more likely to lead underwrite risky bonds and non-rated bonds. On average, the total issue cost is lower if the lead underwriter is a proximate bank. This is consistent with the ability of geographically proximate banks to take advantage of their better access to information. However, such relation does not hold in the emerging markets. Furthermore, it should be noted that the absolute advantage of proximate underwriter on bond issue costs tends to be weak in countries with good investor protection legal system.

Chapter 1

Introduction

The recognition of international portfolio diversification benefits has greatly spurred international investing from around the world. This trend motivates practitioners, researchers and policymakers to broaden the perspective on the driving factors that direct the development of international capital markets.

International capital markets promote economic efficiency by directing the capital to its productive use in the international dimension. However, companies have to bear in mind the potential obstacles when venturing abroad. One concern arises from the information asymmetry between foreign and domestic investors. Due to the fact that domestic investors have better access to the company information source, foreign investors seem to be at a disadvantage in making investment decisions. In the wake of such informational obstacles, some countries enforce effective investor protection legal regimes while others encourage companies to voluntarily establish their own rules more suited to their specific situations. These cross-country legal variations, associated with distinct firm attributes, generated even broader discussion regarding the possible impact on investing and trading behavior in international capital markets. A question being asked is how investors, corporations and governments optimally interact around the world.

The following three chapters provide some responses to this critical question by investigating two primary international capital markets: equity market and bond market. Chapter 2 considers the impact of firm-level and country-level corporate governance on the company information environment as measured by stock price informativeness. Based on the same sample as in Chapter 2, Chapter 3 examines how investors utilize accounting information at the time of public information announcements across companies with different levels of corporate governance. Different from the preceding two chapters, Chapter 4 focuses on the impact of geographic proximity on the selection of underwriters in international bond primary markets.

1.1 Stock price informativeness and corporate governance

The investing confidence that arises from strong investor protection mechanisms promotes the firm-specific information trading. As a result, stocks in countries or companies that are characterized by strong investor protection exhibit high private information content.

There has been a few notable empirical evidence documenting a positive link between the corporate governance and information processing about the company at the country level or in a single-country context. At the country level, the firm-specific return variation is relatively low in countries with weak investor protection and opaque information environment (see Morck, Yeung, and Yu (2000); Jin and Myers (2006)). In addition, Fernandes and Ferreira (2007a) find that the enforcement of insider trading law corresponds to an improvement in stock price informativeness. At the firm level, Ferreira and Laux (2007) reach the same conclusion in the U.S.

Although the existing studies provide us with invaluable insights on the information perspective of corporate governance, it still leaves us many unexplored ques-

tions. Does the positive relation between firm corporate governance and stock price informativeness continue to hold outside the U.S.? Where the investor legal protection is regarded as the strongest? How do corporate governance practices interact with existing country legal environment? Do all corporate governance mechanisms result in active private information trading activities? These questions can only be solved if we study firm-specific corporate governance, country legal regimes and stock price informativeness in one framework.

On the basis of a sample of international companies covered by the Institutional Shareholder Services (ISS) database, we first test the relation between firm-specific corporate governance and the information content of stock prices for the period 2002-2005. We find that stock price informativeness as measured by firm-specific return variation, increases with the strength of investor protection the company commits to. However, it is noteworthy that not all the corporate governance mechanisms encourage the private information trading. Board quality seems insignificantly associated with the private information incorporated into stock prices, although anti-takeover provisions and audit quality appear to improve private information trading. This indicates that governance mechanisms from external sources such as market for corporate control and auditing services are more effective than merely internal monitoring in the trading process.

Second, we examine how corporate governance practices interact with its country legal environment in influencing the company information environment. We find that in countries with weak investor protection legal system or poor information disclosure practices, the relation between firm-level governance rating and price informativeness measure tends to be strong. This serves as evidence supportive of the notion that market participants do value the firm's implementation of good corporate governance in countries with poor legal environments.

1.2 Market behavior around earnings announcements and corporate governance

As an extension of the first essay, we document another channel through which an effective firm corporate structure may increase the market valuation of the company in the second essay. Specifically, we examine whether the effectiveness of firm corporate governance gives credibility of earnings announcements on a sample of over 20,000 firm-year observations across 23 developed countries for the period 2002-2005. Public earnings announcements are among the most important corporate announcements which resolve much uncertainty about stock pricing. However, to what extent stock prices reflect the information contained in the announcements largely depends on the usefulness of the information perceived by the investors. Corporate governance mitigates the incentives of insiders to conceal private control benefits and trade on private information, thereby enhancing the information content of earnings announcements. In a recent study, DeFond, Hung, and Trezevant (2007) find that market reactions to annual earnings announcements are stronger in countries with higher quality earnings or better enforced insider trading laws.

Based on prior research that identifies investor protection institutions as a key factor affecting the informativeness of earnings announcements, we focus on within-country variations in corporate governance practices as a factor of determining the quality of earnings announcements. We argue that a good corporate governance structure improves the quality of accounting information, which leads to strong market reaction to annual earnings announcement for good governance companies. The reasons are twofold. First, a sound internal governance restricts the management tendency of concealing private control benefits, thereby reducing earnings manipulation and guaranteeing the quality of a company's accounting information (see Ball, Kothari, and Robin (2000); Leuz, Nanda, and Wysocki (2003)). Investors consider the message conveyed by good governance to be positive and react strongly

to announcements for good governance companies. Second, an effective corporate governance mechanism can deter the insider activities (see Ackerman and Maug (2006); Fernandes and Ferreira (2007)) including trading on private information prior to company public announcements. As a result, we expect strong market reaction at the time of earnings announcement.

In analysis of over 20,000 firm-year observations from 23 countries, our primary finding is in support of corporate governance associated with strong market reaction around earnings announcements. Specifically, the results of regressing market price volatility reaction on firm corporate governance score and a series of control variables show that the magnitude of market reactions increases with a firm's internal governance quality. The results are in line with the notion that internal corporate governance gives credibility to accounting information and puts constraints on insider activities, which leads to strong market reactions around earnings announcements. Moreover, evidence shows that company governance practices are at least as important as country governance regulations in explaining market behavior at the time of earnings announcements.

1.3 Geographically proximate underwriters and international bond underwriting

International bond markets account for a vast majority of international capital markets. In Chapter 4, the focus is on the geographic proximity of underwriting banks selection in the international bond primary market.

Geographic proximity preference, namely home bias, is one of the most non-controversial facts in finance. The phenomenon is found in equity portfolio investment and the selection of overseas cross-listing venues, among others. In this chapter, we extend to investigate the existence of geographic proximity preference

in international bond underwriting. On the basis of 3,982 international bond new issues for the period 1999 to 2005, we find that the bond issuer's geographic proximity preference seems not to persist around the world as compared to that in other finance areas. The extent of the geographic proximity tendency largely depends on a country's economic and legal characteristics.

In addition, we seek to explain the geographic proximity preference in selecting the lead underwriter in this particular marketplace. Prior literature on geographic proximity offers two explanations for us. One argument states that locals are better informed than foreigners in that they have better access to the information sources about the company. The flip side of the argument is the familiarity explanation. That is, the popularity of such preference is simply because locals feel more familiar with companies nearby. This argument has nothing to do with an information story.

We investigate these two explanations using a probit model with geographic proximity variable as the binary dependent variable, and deal and firm characteristics as independent variables. We find strong support for an informational explanation. Specifically, during the sample period, the geographically proximate banks are more likely to lead underwrite risky bonds and non-rated bonds. The results imply that proximate banks appear to have better access to the private information about a company in bond underwriting business.

We also examine the impact of geographic proximity preference on the bond issue costs. We use ordinary least squares regression model with the issue costs as the dependant variable. Our results show that domestic investment banks, on average, charge 34.8 basis points lower cost than non-domestic banks. The finding further confirms an informational explanation on geographic proximate bond underwriting. Furthermore, the results suggest that geographic proximate underwriting has a pro-competitive effect in that it, to some extent, reduces the bond at-issue costs.

Chapter 2

Stock price informativeness and corporate governance: An international study

Abstract

This paper performs a cross-country analysis of the relationship between corporate governance and the amount of private information in stock price. Existing evidence suggests that investor protection and transparency associated with strong corporate governance encourage informed trading, thereby facilitating financial market efficiency. Using firm-level data from 22 developed countries, we find that firm-specific stock return variation, a measure of stock price informativeness, increases with the quality of a firm's corporate governance. This finding is more pronounced among companies with low governance. The results show that anti-takeover and audit ratings, while not board quality, are positively related to stock price informativeness. In countries with poor legal environment, company corporate governance plays a more significant role in increasing stock price informativeness. This suggests

the substitutability between company and country corporate governance from an investor perspective. The market views a firm's commitment to better corporate governance favorably in countries with poor legal environment.

2.1 Introduction

A large body of literature identifies several aspects from which corporate governance creates corporate wealth at both the firm and country levels. Companies with strong governance practices increase access to external financing, display better operating performance, and reduce their cost of capital (see Claessens (2006) for a recent review). Nonetheless, the channel through which corporate governance creates firm value is essentially determined by the amount of company information perceived by investors and incorporated into stock price via the trading process. Therefore, it is important that we understand how corporate governance, at both the firm and country levels, directly links to firm-specific information collection and trading, thereby influencing equity market efficiency. Our study investigates this research question using a sample of over 2,000 firms with detailed governance attributes data from 22 developed countries for the 2002-2005 period.

We test the positive relationship between stock price informativeness and corporate governance, based on the argument by Grossman and Stiglitz (1980). Traders consider costs and benefits before conducting private information collection. They are only willing to gather and process the firm-specific information when information trading benefits outweigh costs. We argue that effective corporate governance rewards investors' efforts in analyzing the information, thereby increasing the amount of firm-specific information incorporated into stock price. Consistent with this argument, there are three primary findings in this paper. First, stock price informativeness, as measured by firm-specific stock return variation, is positively associated with overall firm-level corporate governance rating. To examine it in more detail, we also consider each of the three aspects of corporate governance, including anti-takeover, audit, and board structure. The anti-takeover and audit ratings are both positively related to firm-specific return variation, while the board structure rating is not. Second, the relationship between corporate governance and price informa-

tiveness is strongest among companies at low level of corporate governance. Lastly, firm corporate governance substitutes for the country-level governance in encouraging informed trading, thereby conveying the private information into stock price.

Few notable empirical evidence document a positive link between corporate governance and information processing about the company at the country level or in a single-country context. At the country level, the firm-specific return variation is relatively low in countries with weak investor protection and opaque information environment (see Morck, Yeung, and Yu (2000); Jin and Myers (2006)). In addition, Fernandes and Ferreira (2007a) find that the enforcement of insider trading law corresponds to an improvement in stock price informativeness. At the firm level, Ferreira and Laux (2007) reach the same conclusion in the U.S. In particular, stocks of companies with weak anti-takeover provisions experience active informed trading, thereby informative pricing.

However, corporate governance practices vary across borders. In an international context, the association between the corporate governance and stock price informativeness can be complex for several reasons. First, a complete corporate governance system does not only consist of anti-takeover provisions but also other aspects such as audit and board structure. The consideration of such a system is especially crucial in a cross-country setting because one particular governance aspect that is useful in one specific country might not have any effect in the other countries. For example, the active takeover market in the U.S. results in widespread acceptance of anti-takeover provisions as an effective governance device in the country. On the contrary, the impact of anti-takeover provisions is weak outside the U.S. because the takeover events are rare in these locations as a result of the firm ownership concentration (see Denis and McConnell (2003) for a review). Moreover, mechanisms of one corporate governance system are interrelated. Gillian, Hartzell, and Starks (2006) find that powerful board serves as a substitute for the corporate openness to market control (anti-takeover provisions).

Second, country legal environment substantially influences the choice of firm-specific corporate governance structure. Doidge, Karolyi, and Stulz (2007) find that variations in firm governance rankings are most explained by country characteristics. Moreover, several international studies suggest a substitution role of firm-level governance practices for country-level governance rules in terms of market valuation (see Durnev and Kim (2005); Bruno and Claessens (2007)). To date, however, there is no direct evidence that explains how the interrelation between firm-level governance and country-level legal environment affects the firm-specific information gathering and processing in one framework. Therefore, only by taking into account both the firm- and country-level governance structures, can we draw solid conclusions on the relationship between corporate governance and stock price informativeness.

Lastly, we can not rule out the possibility of a negative relationship between the governance practices and stock price informativeness. There are at least two arguments in the literature that could justify a negative association between governance and the rate of firm-specific information in stock price. One argument comes from Kim and Verrecchia (2001). The authors argue that timely and accurate disclosure required by firm-specific governance provisions could crowd out the private information collection. Fernandes and Ferreira (2007b) find evidence supportive of this notion in case of cross-listings on the U.S. exchanges.¹ The other argument is proposed by Ferreira, Ferreira, and Raposo (2007). They theoretically and empirically show that there exists a trade-off relationship between firm-level oversight rules (governance structure) and external monitoring (price informativeness). The monitoring function of stock price substitutes for the necessity of implementing strong governance structure internally.

These potential cross-country complexities motivate us to investigate the rela-

¹Fernandes and Ferreira (2007b) find that firms in emerging markets experience the decreases in stock price informativeness after cross listed in the U.S. This result suggests that an increased governance environment associated with cross-listings on U.S. exchanges crowds out the private information collection for firms from countries with weak legal environment.

tionship between corporate governance and stock price informativeness based on firm level and country level data from 22 developed countries. Key to our research investigation is the measurement of firm-level corporate governance. Our firm corporate governance information is obtained from the the Institutional Shareholder Services (ISS) database, which covers a comprehensive spectrum of 55 corporate governance attributes. Based on this unique database, we construct four governance indices for different purposes. *GOV7* index is our central firm corporate governance measure, which is created using seven commonly used governance provisions suggested in Aggarwal, Erel, and Stulz (2007). It consists of board independence, whether to elect board annually, whether to ratify an audit committee annually, audit committee composition, board size, CEO/chairman separation, and capital structure. Aggarwal et al. (2007) demonstrate the validity of this index by showing that *GOV7* is positively associated with firm's market value based on our particular data source. Moreover, this governance index integrates three major aspects of corporate governance, including the power of board, anti-takeover provisions, and audit practices. As such, this index satisfies our requirement and allows a cross-country comparison of firm-level governance practices. In addition to *GOV7* index, we construct anti-takeover, audit, and board index to study how each corporate governance mechanism interacts with stock price informativeness in more detail.

Another challenge of this study is in determining a proxy for stock price informativeness. Our primary measure of price informativeness is firm-specific return variation (stock price non-synchronicity) proposed by Roll (1988) and developed by Morck, Yeung, and Yu (2000). It is computed on the basis of R squared in the market model, the low value of which means significant private information trading. A number of literature supports an informational interpretation of this measure. For instance, it is shown that stock price non-synchronicity is associated with more efficient capital allocation in the U.S. (see Durnev, Morck, and Yeung (2004); Chen, Goldstein and Jiang (2007)) and around the world (see Wurgler (2000)). Further-

more, firms and industries in the U.S. with high firm-specific return variation are more informative about current and future earnings (see Durnev, Morck, Yeung, and Zarowin (2003)). The equity holding patterns of better informed investors also support firm-specific return variation as a good proxy for the rate of private information in stock price. For a sample of U.S. firms, stocks that are concentrated with institutional investors and corporate insiders display high firm-specific return variation (see Piotroski and Roulstone (2004); Ferreira and Laux (2007)).

Having discussed the proxies for firm governance structure and price informativeness, we address the question of how the firm-level governance as a whole affects the informed trading, thereby promoting informative pricing. We find a statistically and economically significant positive association between *GOV7* and firm-specific return variation after controlling for various firm characteristics as suggested in the literature. Furthermore, such an association is strongest among the companies with low corporate governance ratings. This result is consistent with firm-level corporate governance increasing stock price informativeness. A firm's commitment to outside investors and transparent information disclosure associated with the commitment encourage the firm-specific information collection and trading, which leads to the efficient equity pricing.

In this paper, we also find that various aspects of the firm corporate governance structure have dramatically different influences on the stock price informativeness. On one hand, firm-specific return variation is positively related to the ratings of anti-takeover and audit. Weak corporate anti-takeover defenses increase the likelihood of market takeover events, which offers the incentives of informed trading (see Ferreira and Laux (2007)). Strict audit governance rules result in transparent information disclosure, which allows for high rate of information incorporated into stock price (see Jin and Myers (2006)).² On the other hand, the measure of stock price

²Jin and Myers (2006) contend that in one informationally opaque company, corporate insiders hide the true state of cash flow from the investors and absorb the business risk, resulting in low firm-specific return variation.

informativeness has no significant relationship with the quality of board measure. The results suggest that it is the external governance forces such as audit services and market for corporate control that encourage the private information trading.

Importantly, our unique sample allows us to examine how country-level governance rules interact with firm-level governance practices in affecting the stock price informativeness for a wide range of developed countries. We find that the relation between firm-level governance rating and price informativeness measure appears stronger in countries with weak investor protection legal system or poor information disclosure practices. This is in line with the notion that the market participants do value the firm's implementation of good corporate governance in countries with poor legal environments. This, in turn, promotes the information trading and financial market efficiency in less investor-friendly jurisdictions.

Our results withstand several robustness tests. First of all, our measure of price informativeness, firm-specific stock return variation, is admittedly not without a flaw. Pricing errors and noise trading can give rise to firm-specific return volatility as well. Thus, we run the analysis using two alternative price informativeness proxies. One proxy is the probability of informed trading (PIN) calculated based on a structural market microstructure model developed in Easley, Kiefer, O'Hara, and Paperman (1996). Another information flow measure is drawn from Llorente, Michaely, Saar, and Wang (2002). However, regardless of which measure is used, the positive relationship between corporate governance rating and price informativeness remains.

Second, we examine if the price informativeness improvement effect of corporate governance is driven by other external factors such as informed market participants and need for external financing. Following Piotroski and Roulstone (2004) and Chan and Hameed (2006), we include analyst coverage, mutual fund holding and insider ownership as additional explanatory variables in the baseline regression model. The

results corroborate previous conclusions. Interestingly, we find that the positive association between the price informativeness and corporate governance rating tends to dampen for firms that rely more heavily on external financing.

The organization of the paper is as follows. Data and variable construction are presented in Section 2.2. Main empirical results are summarized in Section 2.3. In Section 2.4, we further investigate the impact of country legal regime on the relationship between firm corporate governance practices and stock price informativeness. Several robustness checks are conducted in Section 2.5. Section 2.6 concludes.

2.2 Data and variable construction

Our sample comes from the following six data sources: firm governance attributes information from the ISS; trading-related data from Datastream; international intra-day transactions data from TAQTIC provided by the Securities Industry Research Centre of Asia-Pacific (SIRCA); firm financial characteristics data from Worldscope; country characteristics data from World Development Indicators (WDI); and analysts information from I/B/E/S. Due to the availability of the ISS corporate governance data, our sample period ranges from 2002 to 2005.

2.2.1 Proxies for firm corporate governance

We base our tests on a unique and detailed corporate governance dataset for the period 2003-2006 provided by the ISS. However, we regard the sample period ranging from 2002 to 2005 due to the fact that the corporate governance information collected by ISS for the year reflects the corporate governance of the year before (see Aggarwal et al. (2007)). To generate a corporate governance index, the ISS analysts track the publicly disclosed documents and provide daily updates for a comprehensive spectrum of 55 different governance attributes for non-U.S. international firms

in 22 developed countries. These international firms the ISS covers are large firms, which are part of one of the following indices: Russell 3000, S&P 500, S&P 400, S&P 600, MSCI's EAFE (Europe, Asia and Far East) index and S&P's Composite TSX index (Canada). There is considerable overlap between these indices. In total, there are 8,020 sample firms across 22 developed countries. Among the 22 developed countries considered, the United Kingdom and Japan firms account for the largest observations.

Following the previous studies (see Gompers, Ishii, and Metrick (2003); Bebchuk and Cohen(2005)), we adopt a widely accepted additive system to measure the quality of a firm's corporate governance structure in one single figure. The ISS data manual provides us with the minimal acceptable standard on each corporate governance attribute. Our governance index takes a value of one if the firm meets the minimal acceptable standard on that attribute, and zero otherwise. We exclude the attribute if the governance information regarding the attribute is unavailable. For each company, the rating in the governance index is computed as the number of criteria met by the company in that particular index, divided by the total number of non-missing attributes in the same index.

Our key index, *GOV7*, is constructed to measure the company's overall corporate governance quality following Aggarwal et al.(2007). The overall index, *GOV7*, reflects the information about anti-takeover, audit and board quality as a whole. It is composed of the following attributes: Board independence: board is controlled by more than 50% independent outside directors; Board size: the board has more than five members but less than 16; Chairman/CEO Separation: chairman and CEO are separated or there is a lead director; Board structure: annually elected board (no staggered board); Audit committee independence: audit committee comprised solely of independent outsiders; Auditor ratification: auditors ratified at most recent annual meeting; and Stock classes: only one class of common stock (no dual class).

Corporate governance practices are more than one point system. It is more informative if we examine each governance mechanism in more detail. Therefore, in an attempt to discern the informed trading improvement effect among different governance mechanisms, we also construct three different indices that reflect the anti-takeover, audit and board quality, respectively. For the convenience of comparison, we calculate all ratings in a manner consistent with *GOV7*.

1. *Anti-takeover index.* A mounting evidence pinpoints the importance of anti-takeover provisions as a good governance indicator. Firms with weak anti-takeover defenses are subject to market control, which monitors the corporate managers' self-serving behavior and creates the incentives of outsiders' informed trading. The ISS database provides seven anti-takeover relevant provisions, we incorporate all of them to construct this index. In particular, we assign one point each if the company does not have dual class structure, if majority vote is required to approve mergers, if shareholders can call special meetings and act by written consent, if the company either has no poison pill or a pill that was shareholder approved, if a company is not authorized to issue blank check preferred and if a company is incorporated in country with anti-takeover provisions.

2. *Audit index.* One positive impact of a good governance system is the accounting transparency. Audit index is designed in a way to reflect the information transparency associated with an effective governance system. The ISS guideline provides four audit related provisions, and we include all of them to construct the audit index. Specifically, we give one point each if audit committee is comprised solely of independent outsiders, if auditors are ratified at most recent annual meetings, if consulting fees are less than audit fees, and if the policy is disclosed regarding auditor rotation.

3. *Board index.* Due to the contradictory relationship between a company's board quality and price informativeness as previously mentioned, we specifically construct a board index from *GOV7*. Specifically, our board index consists of the following

four attributes: board independence (if board is controlled by more than 50% independent outside directors), board size (if it is greater than five but less than 16), chairman/CEO separation (if chairman and CEO are separated), and no staggered board.

Table 2.1 reports the detailed information about each of the four indices. The variability in corporate governance practices is well captured by *GOV7* index. For instance, the board of less than half of the sample firms is controlled by more than 50% independent outside directors. Likewise, in only 53.5% of sample firms, the auditors are ratified at most recent annual meetings. Turning to the three specific governance mechanisms, we further observe several interesting statistics. First, with respect to anti-takeover index, the majority (more than 90%) of firms satisfy single class capital structure, special meetings, poison pill provisions. It appears that the three provisions are required by law across the 22 developed countries. Second, the variability persists among all the four audit related provisions. For instance, in merely 43.2% of the firms, audit related consulting fees are less than audit fees. With respect to the board index, the satisfaction of the governance criteria varies dramatically. For example, the board is controlled by more than 50% independent outside directors in 31.9% sample firms while chairman and CEO are separated or there is a lead director in 88.8% sample firms. The descriptive statistics infer the importance of studying the company governance outside the U.S. because the governance attributes that are popular in the U.S., such as cumulative voting rights, do not appear to suit companies in other countries.

2.2.2 Proxies of Country-level governance

In order to conduct tests on the interrelation between firm-level governance practices and country-level governance rules, we search the literature for the appropriate country-level governance proxies. Three different measures of country-level gover-

nance are selected and discussed in the following.

First, a large body of international studies stress the importance of country legal origin as a proxy for investor protection environment. La Porta Lopez-de-Silanes, Shleifer, and Vishny (1998), for example, suggest that legal protections are determined to a large extent by the colonial history of the country. Common law countries such as the U.K. provide better protection for minority shareholder rights than civil law countries such as Germany. Hence, the legal origin of the country makes a plausible proxy for the country-level governance.

Second, we also adopt the newly updated anti-self-dealing index as a proxy for country-level governance. A good legal system is not sufficient to guarantee a good governance environment if the legal enforcement is somehow weak. Thus, we include the anti-self-dealing index available in Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2006) to capture legal enforcement in one country. There are two reasons why we use this new measure rather than the rule of law index in La Porta et al. (1998). For one, the rule of law index was composed in the early 1990s, which mismatches our sample period. More important, the objective of the anti-self-dealing index suits the ownership structure of sample firms. According to La Porta, Lopez-de-Silanes, and Shleifer (1999), the majority of foreign companies outside the U.S. are controlled by the corporate insiders. The new agency problem emerges from these insiders diverting the profits from the company they own. Therefore, it is more appropriate to use the anti-self-dealing index in this study.

Last but not least, a country's transparent information environment is an important feature that results from its good corporate governance regime and affects the informed trading. Based on a wide range of country level data, Jin and Myers (2006) contend that in informationally opaque companies, corporate insiders hide the true state of cash flow from outsiders, which gives rise to low firm-specific return variation. Thus, we also consider the country-level transparency as a country gover-

nance device for the investor protection. The measure of the accounting disclosure transparency comes from Bushman, Piotroski, and Smith (2004) which has been widely applied in previous international studies (see Durnev, Li, Morck, and Yeung (2004); Li, Moshirian, Pham, and Zein (2006); Jin and Myers (2006)).

2.2.3 Measures of stock price informativeness

Key to this study is determining the measure of price informativeness. To avoid spurious inference due to the measurement error, we proxy for price informativeness by using three alternative measures on the basis of weekly and intraday trading data. The stock return and trading volume are retrieved from Datastream, and the intraday transactions data are gathered from TAQTIC. TAQTIC is a historical market data service, providing global intraday transactions data for over ten years since 1996. It obtains the data directly from Reuters real-time network for an extensive range of equities, including their derivatives, indices and foreign exchange instruments. Messages are captured in real-time and are time-stamped in milliseconds.

Firm-specific stock return variation is our primary measure of stock price informativeness. The idea is that the individual stock moves independently from the market if there is firm-specific information impounded by the informed traders. There are a series of papers showing that firm-specific return variation is an appropriate measure for stock price informativeness. For example, Durnev, Morck, Yeung, and Zarowin (2003) find that U.S. firms with lower R^2 values have more future earnings information reflected in the stock prices, consistent with the view that differences in firm-specific return variation is due to the differences in their firm-specific information impounded into stock price. Piotroski and Roulstone (2004) and Ferreira and Laux (2007) also provide the evidence in support of an informational interpretation of firm-specific return variation. They both find that firm-specific

return variation increases with the trades of informed market participants such as insiders and institutional investors.

Following Morck et al. (2000), we calculate logistically transformed firm-specific return variation on the basis of the two-factor international market model as shown below.

$$r_{i,s} = \alpha_{i,s} + \beta_{1i} * r_{m,s} + \beta_{2i} * (r_{US,s} + e_{i,s}) + \varepsilon_{i,s} \quad (2.1)$$

where $r_{i,s}$ is the weekly return for firm i , and $r_{m,s}$ is value-weighted local market excess return in week s . We also convert the return on U.S. market, $r_{US,s}$ to local currency using the exchange rate $e_{i,s}$. Firms with less than 30 weekly returns each year are excluded from the estimation in a given year. The value of R^2 of equation (2.1) is the measure of stock price synchronicity. Given the bounded nature of R^2 and for the ease of interpretation, we conduct tests using logistically transformed R^2 as below:

$$LRSQ = \log\left(\frac{1 - R^2}{R^2}\right). \quad (2.2)$$

We use $LRSQ$ as a proxy for stock price informativeness throughout the empirical tests. When there is firm-specific information impounded into stock price, we should observe the lack of market synchronicity and higher value of $LRSQ$.

Admittedly, firm-specific return variation might not accurately capture the firm-specific information in stock price due to pricing error or noise trading.³ To substantiate the robustness of our results, we also include two alternative measures of stock price informativeness. One is suggested by Llorente, Michaely, Saar and Wang (2002). We construct the measure of price informativeness for each firm-year by estimating the following regression model:

³Specifically, Teoh, Yang and Zhang (2008) suggest that low R-squared value indicates firm-specific uncertainty rather than private information. I admit the limitation of R-squared measure and urge caution for interpretation of the results.

$$r_{i,s} = \alpha_i + \theta_{1i}r_{i,s-1} + \theta_{2i}r_{i,s-1}VO_{i,s-1} + \varepsilon_{i,s} \quad (2.3)$$

where $r_{i,s}$ is the weakly return for firm i , and $VO_{i,s-1}$ is the log turnover at week $s - 1$ detrended by subtracting a 26-week moving average.

The coefficient θ_{2i} is the proxy for stock price informativeness. The high value of this measure indicates high amount of firm-specific information conveyed into stock price. The rationale follows that given the turnover is high, the stocks tend to exhibit a positive return autocorrelation if there is active informed trading.⁴

A third measure of stock price informativeness is the probability of informed trading (PIN), developed by Easley, Kiefer, O'Hara and Paperman (1996). It is based on a structural market microstructure model which consists of three participants, noise traders, informed traders and a market maker. Informed traders will only trade on their private information when they believe the information is not publicly known. Thus, PIN directly captures the private information reflected in stock price. By definition, PIN is calculated as the estimated arrival rate of informed traders divided by the estimated arrival rate of all trades given a period of time. Formally,

$$PIN = \frac{\alpha\mu}{\alpha\mu + 2\varepsilon}. \quad (2.4)$$

α is the probability that an information event occurs, and μ is the arrival rate of informed traders. Each buy and sell order arrives to the market according to an independent Poisson distribution with a daily arrival rate equal to ε .

⁴Llorente et al. (2002) contend that there are two types of trades, namely, hedging and speculative trades. When investors sell a stock for hedging reasons, the stock's price must decrease to attract other investors to buy. Since the expectation of future stock payoff remains the same, the decrease in the price causes a low return in the current period and a high expected return for the next period. However, if investors sell a stock for speculative purposes, its price decreases, reflecting the negative private information about its future payoff. Since this information is usually only partially impounded into the price, the low return in the current period will be followed by a low return in the next period. Intensive trading volume can help to identify the periods in which either hedging or informational shocks occur. In periods of high volume, stocks with a high degree of speculative trading tend to exhibit positive return autocorrelation and stocks with a low degree of speculative trading tend to exhibit negative return autocorrelation.

Suppose δ is the probability of bad news on an information event day. Let $\theta = \{\alpha, \mu, \varepsilon, \delta\}$. The likelihood function for a single trading day j is given by:

$$L(\theta|B, S) = \alpha \delta e^{-(2\varepsilon+\mu)} \frac{\varepsilon^B (\varepsilon + \mu)^S}{B!S!} + \alpha (1-\delta) e^{-(2\varepsilon+\mu)} \frac{(\varepsilon + \mu)^B \varepsilon^S}{B!S!} + (1-\alpha) \delta e^{-(2\varepsilon)} \frac{\varepsilon^{B+S}}{B!S!}. \quad (2.5)$$

B is the number of buys and S is the number of sells on a trading day j . Using intraday trading information over J days, one can estimate the parameter vector θ by maximizing the following likelihood function,

$$L(\theta|B, S) = \prod_{t=1}^J L(\theta|B_j, S_j). \quad (2.6)$$

Following the procedure given by Easley, Hvidkjaer, and O'Hara (2002), we first classify the trades on each trading day j as a buy-initiated or sell-initiated trade using the algorithm by Lee and Ready (1991). We only include the trading data within the operating hours on each domestic exchange. Then the information about the number of buys and sells allows us to estimate a firm-year PIN. We set the firm-year PIN observation as missing value if the trading data for the specific stock are unavailable in a given year.

2.2.4 Measures of control variables

We include a variety of firm and country control variables drawn from the literature to explain the cross section of stock price informativeness variations. The analyst activity information is obtained from historical I/B/E/S database. The firm characteristics data are available in Worldscope and Datastream databases. Country characteristics are drawn from the WDI database.

For consistency purpose, all control variables are taken for the period 2002-2005 to coincide with our corporate governance data. Our initial sample begins with 8,020 non-US firm-years included in the ISS database for this particular period.

We eliminate from the analysis the firms operating in highly regulated industries including utilities, transportation, telecommunication service, insurance, energy and banks and firms with missing financial data. This reduces our sample to 5,744 firm-year observations.

The firm level controls that explain the cross section of stock price informativeness include profitability volatility, return on equity, dividend yield, business diversification, trading volume, firm size and U.S. cross-listing. Piotroski and Roulstone (2004) suggest that as the volatility of the firm’s profitability increases, it is less likely that the stock return is correlated to the market return in a synchronous manner. Thus, we control the effect of volatile profitability on price informativeness using a measure of the standard deviation of the firm’s return on equity (*STDROE*) three years including and preceding a given year. We expect a positive relation between *STDROE* and *LRSQ* according to the previous study.

In addition, the more diversified the firm’s primary operation is, the less likely the firm is sensitive to the macroeconomic conditions. Also, diverse firms are more opaque to the outside investors (see Ferreira and Laux (2007)).⁵ In this paper, we control for the business diversification of the company by calculating the number of business segments the firm operates in (*BSEGMENT*). We expect that *BSEGMENT* is positively related to *LRSQ*.

Trading volume is considered as a control variable for price informativeness in this study. Chan and Hameed (2006) suggest that the trading volume determines the stock price synchronicity because the actively traded stocks adjust quickly to the market information so that these individual stock returns are more synchronous with the market return. We calculate the trading volume based on the 12-month average stock turnover (*TURN*). Turnover is defined as the monthly number of shares traded scaled by the number of shares outstanding. Our prediction is that

⁵Ferreira and Laux (2007) consider three proxies for a firm’s operational complexity, that is, firm size, the degree of corporate diversification and firm age. Due to the data availability, we only consider firm size and the corporate diversification in this study.

TURN is inversely associated with *LRSQ*.

We also control for the U.S. cross-listings of sample firms in our regression tests. Several studies show that cross listing in the U.S. market alters the information environment of the company. A firm's commitment to strong corporate governance and high quality disclosure regulations improves its domestic information environment, especially the firm-specific information trading on its stock in home market (see Lang, Lins and Miller (2003); Bailey, Karolyi, and Salva (2006); Fernandes and Ferreira (2007b)). The proxy for cross listing in the U.S. is an American Depositary Receipts dummy (*ADR*), which takes the value one if the firm is cross-listed in the U.S. markets, and zero otherwise. The information about the U.S. cross-listings is obtained from the following institutions: Citibank, Bank of New York, JP Morgan, and Deutsche Bank (Cross listing information about Canadian firms are directly collected from the U.S. stock exchanges).

Finally, we include three other firm characteristics as controls to capture the omitted firm cross-sectional variations. They are percent dividend yield (*DYIELD*), firm's profitability (*ROE*) and firm size (*SIZE*). The profitability measure is return on equity, calculated by net income before extraordinary items scaled by the book value of equity at year end. Firm size (*SIZE*) is the natural log of the firm's total assets in the millions of U.S. dollars.

In addition to firm level controls, we employ two country-level variables in country random effects regressions. The first is the log of GDP per capita (*LOGGDPC*) (in U.S. dollars) as a proxy for economic development, and the second is a country's market capitalization scaled by current-year annual GDP (*MCAP*) as a proxy for financial market development. Morck et al. (2000), for example, find that both economic development and financial development have a positive impact on firm-specific return variation. Thus, we expect that *LOGGDPC* and *MCAP* are positively related to the stock price non-synchronicity, *LRSQ*.

2.2.5 Summary statistics and correlation analysis

Panel A of Table 2.2 presents the distribution of corporate governance ratings across countries. In total, we have 8,020 observations with detailed corporate governance data. In our sample, Japan and United Kingdom account for the largest observations. The median of firm's total assets shown in the last column indicates that the firms in our sample are large sized. In general, firm-level governance rating is relatively high in common law countries. For instance, the median value of corporate governance rating is highest in Canada and the United Kingdom which is 0.857 and 0.714, respectively. In addition, the stock price synchronicity measure, R-squared, is lowest in the United Kingdom and Australia. Incidentally, both countries are in the common law regime.

As to the sample we conduct the regression analysis, the firms operating in highly regulated industries or with missing financial data are excluded, which reduces our firm-year observations to 5,744. Panel B of Table 2.2 reports the minimum, maximum, mean, and standard deviation for corporate governance rating, three alternative price informativeness measures and control variables. Sample average corporate governance rating is moderate with mean of 0.572. To avoid the influence of extreme outliers, all the other variables are winsorized at 1% in both tails of the sample distribution. Our three measures for stock price informativeness generally follow the normal distribution. For example, the mean and standard deviation of *LRSQ* is 1.395 and 1.293, respectively. Moreover, approximately 21.8% of the sample firms cross-listed their shares on the U.S. exchanges, which prompts us to control for the impact of cross-listings on the firm's information environment in our empirical analysis.

Table 2.3 presents the correlation coefficients between key variables. First of all, without controlling for any other factors, corporate governance rating, *GOV7*, is positively related to the price informativeness proxy, *LRSQ*, and the correlation

coefficient is 0.214. This simple correlation test gives us the confidence to conduct more rigorous analysis in the following sections.

In addition, *LRSQ* is also significantly related to other factors such as firm size and business diversification, *BSEGMENT*. It infers that we should include these variables as controls. Moreover, the simple correlation between other control variables are moderate. It is unlikely that our results are driven by the multicollinearity problem.

2.3 Firm-level corporate governance and stock price informativeness

Because we are keen to explore the relationship between the firm-specific corporate governance and stock price informativeness, we first conduct multivariate regression tests with firm-specific stock return variation as dependent variable and company governance indices as key independent variable. Table 2.4 shows how the four governance ratings are associated with the measure of price informativeness, respectively. In Table 2.5, we further explore the incremental effect of company corporate governance practices on the private information trading.

2.3.1 Main regression results

We estimate the relationship between firm-level governance rating and price informativeness using the ordinary least squares (OLS) regression model. To avoid the spurious inference on the relationship between firm-specific return variation and corporate governance rating, we also control for a series of firm characteristics in the following regression model,

$$\begin{aligned}
LRSQ = & \alpha_1 + \beta_1 GOV + \beta_2 MB + \beta_3 STDROE + \beta_4 ROE \\
& + \beta_5 DYIELD + \beta_6 BSEGMENT + \beta_7 TURN + \\
& \beta_8 SIZE + \beta_9 ADR + \varepsilon.
\end{aligned} \tag{2.7}$$

GOV alternatively represents four different firm governance ratings of the year. Firm-level control variables include market to book ratio (*MB*), profitability volatility (*STDROE*), return on equity (*ROE*), percent dividend yield (*DYIELD*), business diversification (*BSEGMENT*), trading volume (*TURN*), firm size (*SIZE*) and ADR dummy (*ADR*). Industry, country and year fixed effects are also included.

Our first empirical hypothesis is that β_1 is positive. Our alternative hypothesis is that β_1 could be negative or insignificant if strong firm-level corporate governance practices crowd out the private information trading of outside investors.

In Table 2.4, we present the results by regressing firm-specific return variation on various corporate governance ratings as specified in equation (2.7). All *t* statistics are calculated based on firm-clustered standard errors. To facilitate the interpretation of the estimates in the OLS regression model, control variables are standardized by deducting the sample mean and dividing by sample standard deviation in the pooled sample.

In Model (1) of Table 2.4, we first test the relation between the governance rating, *GOV7*, and firm-specific return variation in the panel regression. The result is consistent with our prior. The coefficient of *GOV7* is significantly positive at the 5% level. The economic significance of corporate governance rating is noteworthy as well. One percent improvement in the governance rating, on average, increases the logistically transformed stock price non-synchronicity by 20.6%. Considering the mean of *LRSQ* is 1.395 in the pooled sample, such an economic impact is not trivial.

Most control variables capture the expected signs. A firm's volatility of prof-

itability is positively related to price informativeness proxy at the 1% level. Stock return of one company with volatile profitability hardly moves with the market in a synchronous manner. The diversification of firm's operation is negatively related to *LRSQ*, although it is not statistically significant. One possible explanation for the negative sign is that opaque information environment associated with the diversified businesses leads to low private information reflected in stock price. Turnover measure, *TURN*, is also negatively related to the firm-specific return variation. Surprisingly, companies that are cross listed in the U.S. display lower firm-specific return variation. This contradicts the findings in Fernandes and Ferreira (2007b) which contend that the cross listing on the U.S. exchanges improves the information environment of the developed countries firms by encouraging active informed trading.

Other firm characteristic variables also significantly affect the private information content of stock price. Firm-specific return variation is relatively high for firms with low market-to-book ratio, low profitability, high dividend payout ratios or small size. The statistical significance of these control variables implies that we have explained the cross-sectional variations in stock price informativeness resulting from the unobservable firm characteristics.

In Models (2)-(4) of Table 2.4, we present the relation between three different corporate governance devices and stock price informativeness measure, respectively. Consistent with our previous findings, anti-takeover rating and audit rating are positively associated with the firm-specific return variation, respectively. It indicates that both the openness to market control and transparent disclosure can improve the informed trading activities and then increase the firm-specific information reflected in stock prices.

Nevertheless, the rating of board quality, *BOARD*, is not significantly related to firm-specific return variation (see Model (4) of Table 2.4). The finding may be at-

tributed to the different effects of corporate governance mechanisms on a company's information environment. The anti-takeover provisions (the market for corporate control) and external audit services exert external governance efforts while the quality of board is simply an internal oversight. The results in Models (2) - (4) suggest that external governance forces are more effective than internal board oversight, at least in terms of firm-specific information trading.

2.3.2 The incremental effect of corporate governance on stock price informativeness

In Table 2.5, we further explore the relationship between corporate governance and price informativeness by classifying the firms on the basis of their levels of corporate governance. The purpose is to examine whether the relationship between firm-level corporate governance and stock price informativeness is linear. Alternatively, it could be that information content of stock prices does not increase as firm-level corporate governance improves. Such an outcome would occur if the governance practices of the firm exceed its optimal level.

We differentiate the various levels of corporate governance by classifying the firms into three groups according to their rankings of corporate governance in each country, each year. The dummy variable, *BAD*, is equal to one if the corporate governance rating of the firm is at the bottom 30% of the governance rating distribution, and zero otherwise. And, the dummy variable, *GOOD*, is equal to one if the corporate governance rating is at the top 30% of the governance rating distribution, and zero otherwise.

As shown in Table 2.5, the variable *GOV*, alternatively representing the four corporate governance ratings, captures the impact of corporate governance on corresponding stock price informativeness for firms at the medium level of corporate governance ratings. In the first column of the table, we observe that the corporate

governance rating is positively related to firm-specific return variation. Our focus lies on the coefficients of the interaction terms. Interestingly, we find the corporate governance practices matter the most for firms at low level of corporate governance, and least for firms at high level of corporate governance. The results suggest an unobservable optimal level of corporate governance which does not coincide with the highest ranking of firm-level corporate governance.

Such an incremental effect of corporate governance rating holds true when we replace the governance rating, *GOV7*, by anti-takeover rating and audit rating. However, the board rating loses its significance in explaining firm-specific return variation when the sample firms are divided based on their board governance rating levels. It could be that the nonlinear relationship between overall firm-level corporate governance and the information content of stock prices are mainly driven by corporate governance aspects including audit quality and anti-takeover provisions.

To summarize, in the firm-level analysis, the results show a significant and positive relationship between corporate governance and stock price informativeness. Such a positive relation persists for the other two corporate governance indices, namely, anti-takeover index and audit index. However, the board quality is not significantly related to firm-specific return variation. We also examine the incremental effect of corporate governance across firms at different levels of corporate governance. The impact of firm-specific corporate governance on price informativeness is most pronounced among firms at low level of corporate governance ratings.

2.4 Firm-level corporate governance, legal environment and price informativeness

Doidge, Karolyi, and Stulz (2007) stress the importance of country governance to the firm-level governance practices in an international setting. There is a potential

danger that our results could be subsumed by the country governance explanatory variables. Even though this is not a concern, it could be very interesting to explore the interrelation between country governance and company governance with respect to the information environment of the company. To study how the country legal environment affects the relationship between company governance and price informativeness, we estimate the following country random effects regression equation,

$$\begin{aligned}
LRSQ = & \alpha_1 + \beta_1 GOV7 + \beta_2 CTRYGOV + \beta_3 GOV7 \times CTRYGOV + \\
& \beta_4 MB + \beta_5 STDROE + \beta_6 ROE + \beta_7 DYIELD + \beta_8 BSEGMENT + \\
& \beta_9 TURN + \beta_{10} SIZE + \beta_{11} ADR + \beta_{12} LOGGDPC + \beta_{13} MCAP + \varepsilon,
\end{aligned} \tag{2.8}$$

where *CTRYGOV* alternatively represents three different country governance proxies (legal origin, anti-self-dealing index, and CIFAR disclosure index) discussed in Section 2.2. *LOGGDPC* is the log of a country's GDP per capita in a given year and *MCAP* is a country's market capitalization scaled by current-year annual GDP. Equation (2.8) augments the regression model specified in equation (2.7) with country governance measures and the interaction between country and company governance measures. Industry and year fixed effects are also included.

First of all, we check the robustness of the positive relation between firm-specific return variation and *GOV7* based on country random effects regression model as specified in equation (2.8). Compared to the previous results in country fixed effects regression analysis, adjusted R^2 (35.9%) does not reduce much after excluding country fixed effects, which implies that firm characteristics do matter in the firm-specific information incorporated into the stock price. Country-level factors such as the log of GDP per capita and market capitalization significantly determines the firm-specific return variation. It is relatively high in countries that are characterized by advanced economic development. However, it is negatively related to country eq-

uity market development (*MCAP*). This finding is inconsistent with Morck et al. (2000). It might be either due to the lack of variability in capital market development in our sample of 22 developed markets or due to the high correlation between country economic development variable and capital market development variable.

We then investigate the explanatory power of country governance to the firm-specific return variation in Models (2), (4) and (6) of Table 2.6. Regardless of how we proxy for the country governance, the coefficient of country governance receives a positive and significant sign. This is consistent with the notion that the investor confidence is generally high in countries with strong investor legal protection and strict disclosure regulations (see Morck et al.(2000); Jin and Myers (2006)). More important, company governance also significantly influences the collection of and trading on a company’s private information. For instance, in Model (3) of Table 2.6, the coefficient of *GOV7* is as high as 0.307 (*t* statistic is 3.26) after controlling for the country’s legal origin.

Having confirmed the importance of both the country and company governance on explaining the firm-specific return variation, we proceed to study how the country governance interacts with individual corporate governance in affecting the information content of stock prices. The results are illustrated in Table 2.7. First and foremost, the coefficient of *GOV7* is positive and significant throughout the model estimations shown in the table. In addition, the impact of corporate governance is stronger for poorly governed firms, consistent with the results in Table 2.5.

Our focus lies on the coefficient of the interaction terms between country governance and corporate governance. Take Model (1) of Table 2.7 for instance. The coefficient of firm-specific governance rating is 0.481 for firms in civil law countries whilst its value reduces to 0.078 for firms in common law countries. We can observe the same pattern when the country governance mechanism is measured by the anti-self-dealing index or accounting disclosure index, CIFAR. The results indi-

cate that the corporate governance practices substitute for the country governance regulations from an investor perspective. Given the poor investor legal protection environment, the investors acknowledge the governance practices voluntarily adopted by one company. As a result, the firm-level corporate governance promotes the information content of the stock price by gaining the investor confidence. This finding strengthens the role of firm-level corporate governance practices in less investor-friendly jurisdictions.

Further, the substitution effect between country governance and company governance appears strongest among firms at low level of governance ratings. As shown in Models (2), (4) and (6) of Table 2.7, the coefficients of the interaction term between country governance (*CTRYGOV*), company governance (*GOV7*) and poor governance indicator (*BAD*) are negative and statistically significant (-0.363, -0.739 and - 0.025, respectively). The results suggest that for poorly governed firms, country regulation plays a more important role in improving the information environment and promoting the financial market efficiency.

2.5 Robustness checks

Admittedly, our empirical results are subject to many potential biases. Thus, we conduct a battery of robustness tests in this section to rule out the possible factors that might mislead our conclusions.

The primary concern arises from the model specification bias and sample selection bias. Thus, we first re-run the analysis using bi-weekly stock return and single factor market model. We find that previous results seem not sensitive to the frequency of return data and the specification of the market model. To conserve the space, we donot tabulate the results. Also, to avoid the non-synchronous trading impact on the two-factor market model estimation, we add two return lead-lags into the initial two-factor market model following Jin and Myers (2006). As shown in

Model (1) of Table 2.8, our previous results turn even stronger after the inclusion of stock return lead-lags in the international market model specification. Finally, we repeat the previous analysis on a sample excluding Japan and U.K. firms in that the firms from these two countries account for a large proportion of our observations. The unreported results show that previous findings continue to hold.

In addition, it is arguable whether our results are driven by the proxy of stock price informativeness. Hence, we test the main hypothesis by using two alternative measures that are widely cited and applied in the literature. The first measure is PIN, calculated based on the algorithm developed in Easley, Kiefer, O'Hara, and Paperman (1996). The other alternative measure, *TVRINFO*, is drawn from Llorente et al.(2002). The higher the value of the two alternative measures is, the more firm-specific information is reflected in the stock prices. In Models (3)-(6) of Table 2.8, we find that *GOV7* is positively related to both of the two alternative measures of price informativeness at any conventional significance level. However, the incremental effect of corporate governance rating on price informativeness disappears as we use the measure by Llorente et al.(2002) to proxy for stock price informativeness.

Third, Piotroski and Roulstone (2004) find that informed market participants such as corporate insiders, financial institutions and security analysts distinctively but significantly affect the information content in stock prices. In Panel A of Table 2.9, we check the robustness of our results by controlling for the influence of the three market participants, respectively. We measure the insider trading using the closely held percentage of shares (*CLOSELYHELD*) following Dahlquist, Pinkowitz, Stulz, and Williamson (2003) and data are available in the Worldscope database. The institutional holding (*MFHOLD*) is proxied by the annual international equity holdings of mutual fund investors. The mutual fund holdings information is obtained from TFS, which was created by the merger of The Investtext Group, Securities Data Company and CDA/Spectrum. Lastly, analyst coverage (*ANALYST*) is measured by the number of analysts following the company in the

eleventh month of the fiscal year since O'Brien and Bhushan (1990) suggest that the analyst activity levels off in that month. In Panel A of Table 2.9, the coefficient of *CLOSELYHELD* is 0.134 and significant at 1% level and that of *MFHOLD* is 0.359 but not significant. The results indicate that the trading of better informed investors such as corporate insiders and institutions tends to convey the information into the stock price. However, analyst coverage does not seem to incorporate the firm-specific information into stock price since the coefficient of *ANALYST* is significantly negative (-0.022), implying that analysts collect marketwide news rather than firm-specific information. Regardless, we find a strong and positive relation between the corporate governance rating and price informativeness measure in all the regressions in Panel A.

As a last note, we suspect that the need for external financing might affect the relationship between company governance and stock price informativeness. Doidge, Karolyi, and Stulz (2007) find that the value enhancing effect of corporate governance matters most among external financing dependent companies, in part because the investors require these companies to commit to good governance practices. Hence, we are curious about how the external financing dependence influences the relation between company governance and private information collection of outside investors. Following Doidge, Karolyi, and Stulz (2007), we use firm size and sales growth rate as the proxies for firm-specific external financing need. The variable *LARGE* is a dummy variable which takes the value one if the firm size is above the median in each country, and zero otherwise. *SGROWTH* is the sales growth rate as compared to the previous fiscal year. In Panel B of Table 2.9, we observe that the interaction term between our proxies for external financial need and *GOV7* is negative and significant at 1% level. Different from the literature on the value relevance of corporate governance, the results suggest the relationship between price informativeness and company governance weakens as the external financing need increases. We derive an interpretation following the work by Easley, Hvidkjaer, and

O'Hara (2002). The information asymmetries between informed traders and the uninformed increase the extrinsic information risk faced with the uninformed traders, which leads to the increase in cost of capital. Since external financing dependent companies concern with the cost of raising fund, they might implement certain governance rules which prevent the private information trading by the informed traders.

2.6 Conclusion

In this study, we extend the existing literature by studying the relationship between stock price informativeness and firm-specific corporate governance practices using a unique dataset with detailed firm-level corporate governance attributes. A firm's corporate governance rating is positively related to stock price informativeness, as measured by firm-specific stock return variation . A good firm-level governance system efficiently prevents management from self-serving activities and instills confidence for informed trading, which leads to high rate of private information reflected in stock prices. Interestingly, we find that the relation between firm-specific return variation and corporate governance rating, *GOV7*, is more pronounced among companies at low level of governance practices. The results have a strong practical implication for corporations around the world. Investors expect firms to commit to effective governance system, especially for companies with weak governance practices in place.

Further, we document that the positive relation between the firm-specific return variation and corporate governance rating, *GOV7*, does not persist in all the aspects of corporate governance practices. Whilst the ratings of audit and anti-takeover practices are positively associated with firm-specific return variation, firm-specific return variation is insignificantly associated with that of board quality. We expect that these findings may be due to external and internal governance forces. To be more specific, the powerful board serves as an internal governance mechanism, which

is expected to be less effective than external governance devices (such as the market for corporate control and external audit services) in encouraging the investors to trade on firm-specific information.

Importantly, this paper adds to a growing literature on international corporate governance by investigating how country governance regime interacts with firm-level governance in affecting the information environment of the company. Using three different proxies for a country's legal regime, we find the substitutability between country legal regulations and firm governance practices in accounting for the information trading. Durnev and Kim (2005) demonstrate that firms can adapt to poor legal environments to establish efficient governance practices. Our study supports their view by further showing that firm-level corporate governance does influence the extent to which investors engage in firm-specific information trading, especially when country legal environment is poor.

Besides contributing to the literature, this paper has two direct policy implications. First, our results indicate that not all the corporate governance mechanisms improve the company information environment. Therefore, to develop an informationally efficient financial market, policymakers need to advocate the optimal governance practices most suited for their country. Second, instead of focusing on rulemaking and legal enforcement, government can encourage corporate voluntary self-regulation. At the same time, government oversight helps overcome the limitations of corporate self-regulation while still securing the advantages of self-regulation.

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Table 2.1 Corporate governance index

This table presents the composition of each of four corporate governance indices: *GOV7*, *BOARD*, *AUDIT*, and *ANTITAKE*. For each attribute, we report the percentage of firms meeting the minimally acceptable standard. The percentage is computed over 8,020 firm-year observations of each attribute for the period 2002-2005.

Minimally acceptable corporate governance standard	% of firms meeting the standard
<i>GOV7</i>	
1. Board is controlled by more than 50% independent outside directors	31.9
2. Board size is at greater than five but less than 16	83.3
3. Chairman and CEO are separated or there is a lead director	88.8
4. Annually elected board	31.9
5. Audit committee comprised solely of independent outsiders	30.5
6. Auditors ratified at most recent annual meetings	53.5
7. Single class (not dual class capital structure)	92.1
<i>BOARD</i>	
1. Board is controlled by more than 50% independent outside directors	31.9
2. Board size is at greater than five but less than 16	83.3
3. Chairman and CEO are separated or there is a lead director	88.8
4. Annually elected board	31.9
<i>AUDIT</i>	
1. Audit committee comprised solely of independent outsiders	30.5
2. Auditors ratified at most recent annual meetings	53.5
3. Consulting (audit related and other) fees are less than audit fees	43.2
4. Policy is disclosed regarding auditor rotation	34.4
<i>ANTITAKE</i>	
1. Single class, common (not dual class capital structure)	92.1
2. Majority vote requirement to approve mergers	10.5
3. Shareholders may call special meetings	98.9
4. Shareholder may act by written consent	10.1
5. Company either has no poison pill or a pill that was shareholder approved	98.8
6. Company is not authorized to issue blank check preferred	94.5
7. Company is incorporated in country with anti-takeover provisions	30.4

Table 2.2 Descriptive statistics

This tables presents descriptive statistics of the key variables used in the empirical analysis. Panel A shows the number of observations (N), median value of primary governance index ($GOV7$), R^2 , and firm size ($SIZE$) in each country for the sample period 2002-2005. R^2 is estimated based on firm level regressions of weekly stock returns on local and U.S. market indexes in each country each year. $SIZE$ is the logarithm of the total assets in the millions of U.S. dollars. Panel B reports the descriptive statistics of firm-level variables. $LRSQ$ is the logistically transformed firm-specific return variation. $LPIN$ is logistically transformed relative probability of informed trading (PIN) by Easley, Kiefer, O'Hara and Paperman (1996). $TVRINFO$ denotes the information flow measure drawn from Llorente et al. (2002). $STDROE$ is the three-year standard deviation of return on equity preceding and including the given year. ROE is the return on equity. $DYIELD$ is the dividend yield in percentage. $BSEGMENT$ is the number of business segments one company operates in. $TURN$ is the 12-month average number of shares traded scaled by the total number of shares outstanding. ADR is a dummy variable, which takes the value one if the company is cross listed in the U.S. market, and zero otherwise. All variables except $GOV7$ is winsorized at the 1% in both tails of the distribution.

Panel A: At the Country Level				
Country	N	$GOV7$	R^2	$SIZE$
Australia	408	0.571	0.138	7.558
Austria	80	0.500	0.187	8.185
Belgium	96	0.500	0.293	8.246
Canada	747	0.857	0.168	7.516
Denmark	93	0.600	0.229	7.467
Finland	123	0.667	0.144	7.785
France	336	0.429	0.321	9.079
Germany	352	0.571	0.274	8.667
Greece	180	0.536	0.338	6.658
Hong Kong	325	0.571	0.271	7.853
Ireland	63	0.571	0.206	8.062
Italy	260	0.429	0.306	8.898
Japan	2,200	0.500	0.321	8.190
Netherlands	200	0.571	0.262	8.049
New Zealand	65	0.571	0.183	6.720
Norway	88	0.571	0.313	7.070
Portugal	56	0.429	0.274	8.390
Singapore	250	0.571	0.198	7.278
Spain	205	0.429	0.251	8.213
Sweden	186	0.667	0.384	8.267
Switzerland	238	0.667	0.245	7.848
United Kingdom	1,469	0.714	0.134	7.248

Table 2.2 - Continued
Descriptive statistics

Panel B: At the Firm Level				
Variable	Minimum	Maximum	Mean	Standard deviation
<i>GOV7</i>	0.000	1.000	0.572	0.196
<i>LRSQ</i>	-1.004	5.598	1.395	1.293
<i>LPIN</i>	-8.024	-0.552	-1.974	1.304
<i>TVRINFO</i>	-0.258	0.257	0.006	0.104
<i>STDROE</i>	0.211	102.317	9.992	16.125
<i>ROE</i>	1.012	84.250	7.662	23.243
<i>DYIELD</i>	0.000	8.000	2.005	1.766
<i>BSEGMENT</i>	1.000	5.000	3.874	1.353
<i>TURN</i>	0.001	0.340	0.073	0.062
<i>SIZE</i>	1.758	14.262	7.637	1.549
<i>ADR</i>	0.000	1.000	0.218	0.413

Table 2.3 Correlation coefficients between key variables

This table presents Pearson correlation coefficients between key variables employed in this study. *GOV7* is our primary governance rating. *LRSQ* is the logistically transformed firm-specific return variation. *STDROE* is the three-year standard deviation of return on equity preceding and including in a given year. *ROE* is the return on equity. *DYIELD* is the dividend yield in percentage. *BSEGMENT* is the number of business segments one company operates in. *TURN* is the 12-month average number of shares traded scaled by the total number of shares outstanding. *SIZE* is the logarithm of the total assets in the millions of U.S. dollars. *ADR* is a dummy variable that takes the value one if the company is cross listed in the U.S. market, and zero otherwise. All variables except *GOV7* are winsorized at 1% in both tails of the sample distribution. *p* values are reported in parentheses.

Variable	<i>GOV7</i>	<i>LRSQ</i>	<i>MB</i>	<i>STDROE</i>	<i>ROE</i>	<i>DYIELD</i>	<i>BSEGMENT</i>	<i>TURN</i>	<i>SIZE</i>	<i>ADR</i>
<i>GOV7</i>	1.000									
<i>LRSQ</i>	0.214 (0.00)	1.000								
<i>MB</i>	0.131 (0.00)	0.052 (0.00)	1.000							
<i>STDROE</i>	0.083 (0.00)	0.084 (0.00)	0.257 (0.00)	1.000						
<i>ROE</i>	0.055 (0.00)	-0.004 (0.75)	0.260 (0.00)	-0.320 (0.00)	1.000					
<i>DYIELD</i>	0.069 (0.00)	0.079 (0.00)	-0.048 (0.00)	-0.148 (0.00)	0.263 (0.00)	1.000				
<i>BSEGMENT</i>	-0.293 (0.00)	-0.288 (0.00)	-0.160 (0.00)	-0.097 (0.00)	0.004 (0.74)	-0.034 (0.01)	1.000			
<i>TURN</i>	0.114 (0.00)	-0.055 (0.00)	0.098 (0.00)	0.236 (0.00)	-0.067 (0.00)	-0.103 (0.00)	-0.122 (0.00)	1.000		
<i>SIZE</i>	-0.130 (0.00)	-0.447 (0.00)	-0.156 (0.00)	-0.176 (0.00)	0.088 (0.00)	0.062 (0.00)	0.353 (0.00)	0.062 (0.00)	1.000	
<i>ADR</i>	0.116 (0.00)	-0.173 (0.00)	-0.023 (0.07)	-0.047 (0.00)	-0.004 (0.77)	-0.071 (0.00)	0.041 (0.00)	0.087 (0.00)	0.309 (0.00)	1.000

Table 2.4 Effects of corporate governance on stock price informativeness

This table shows the estimated coefficients from ordinary least squares regressions of logistically transformed firm-specific return variation, *LRSQ*, on corporate governance rating and a series of firm-level control variables including industry, country and year fixed effects. The firm-level corporate governance index is denoted as *GOV7*, *ANTITAKE*, *AUDIT* and *BOARD*, respectively. *GOV7* is a percent rating based on seven commonly used governance attributes. *ANTITAKE* is a percent rating based on seven governance attributes relevant to shareholder rights protection. *AUDIT* is a percent rating based on four governance attributes relevant to company auditing requirement. *BOARD* is a percent rating based on four governance attributes relevant to board quality. *STDROE* is the three-year standard deviation of return on equity preceding and including the given year. *ROE* is the return on equity. *DYIELD* is the dividend yield in percentage. *BSEGMENT* is the number of business segments one company operates in. *TURN* is the 12-month average number of shares traded scaled by the total number of shares outstanding. *SIZE* is the logarithm of the total assets in the millions of U.S. dollars. *ADR* is a dummy variable, which takes the value one if the company is cross listed in the U.S. market and zero otherwise. All control variables are standardized by subtracting the sample mean and dividing by the sample standard deviation. All variables except *GOV7* is winsorized at the 1% in both tails of the distribution. Standard errors are adjusted for clustering at the firm level. *t* statistics are shown in parentheses. $\bar{R}^2$ is the adjusted R^2 . The sample period is from 2002 to 2005.

Model	(1)	(2)	(3)	(4)
Intercept	2.001 (18.37)	1.767 (10.70)	2.000 (21.23)	2.204 (22.60)
<i>GOV7</i>	0.206 (2.16)			
<i>ANTITAKE</i>		0.485 (2.65)		
<i>AUDIT</i>			0.257 (3.88)	
<i>BOARD</i>				-0.091 (-1.22)
<i>MB</i>	-0.121 (-5.65)	-0.119 (-5.61)	-0.122 (-5.72)	-0.118 (-5.56)
<i>STDROE</i>	0.076 (3.90)	0.075 (3.87)	0.077 (3.95)	0.076 (3.91)
<i>ROE</i>	-0.051 (-2.63)	-0.052 (-2.66)	-0.051 (-2.62)	-0.051 (-2.64)
<i>DYIELD</i>	0.077 (3.57)	0.080 (3.68)	0.077 (3.56)	0.079 (3.65)
<i>BSEGMENT</i>	-0.034 (-1.53)	-0.035 (-1.56)	-0.036 (-1.60)	-0.036 (-1.59)
<i>TURN</i>	-1.830 (-5.44)	-1.794 (-5.33)	-1.816 (-5.40)	-1.788 (-5.32)
<i>SIZE</i>	-0.467 (-21.27)	-0.462 (-20.97)	-0.467 (-21.32)	-0.464 (-21.08)
<i>ADR</i>	-0.185 (-4.42)	-0.182 (-4.36)	-0.183 (-4.39)	-0.178 (-4.26)
Industry & Year dummies	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
$\bar{R}^2$	0.396	0.396	0.397	0.395
N	5,744	5,744	5,744	5,744

Table 2.5 Incremental effects of corporate governance on firm-specific stock return variation

This table shows the incremental effect of corporate governance on the price informativeness across the firms at different levels of corporate governance. Dependent variable is the logistically transformed firm-specific return variation, *LRSQ*. We rank the firms on the basis of its corporate governance rating by country, by year in a pooled sample. Sample firms with ratings in the bottom 30 percentiles are classified into low quality governance group and those with ratings in the top 30 percentiles are classified into high quality governance group. *BAD* is a dummy variable coded one if the firm is in low quality governance group, and zero otherwise. *GOOD* is also a dummy variable coded one if the firm is in high quality governance group, and zero otherwise. *GOV* alternatively represents *GOV7* index, anti-takeover index (*ANTITAKE*), audit index (*AUDIT*), and board index (*BOARD*). *STDROE* is the three-year standard deviation of return on equity preceding and including the given year. *ROE* is the return on equity. *DYIELD* is the dividend yield in percentage. *BSEGMENT* is the number of business segments one company operates in. *TURN* is the 12-month average number of shares traded scaled by the total number of shares outstanding. *SIZE* is the logarithm of the total assets in the millions of U.S. dollars. *ADR* is a dummy variable, which takes the value one if the company is cross listed in the U.S. market and zero otherwise. All control variables are standardized by subtracting the sample mean and dividing by the sample standard deviation. All variables except *GOV7* is winsorized at the 1% in both tails of the distribution. Standard errors are adjusted for the firm-level clustering. *t* statistics are shown in parentheses. $\bar{R}^2$ is the adjusted R^2 . Sample period is from year 2002 to year 2005.

<i>GOV</i> =	<i>GOV7</i>	<i>ANTITAKE</i>	<i>AUDIT</i>	<i>BOARD</i>
Intercept	1.615 (11.82)	1.186 (6.01)	1.991 (20.98)	2.300 (15.26)
<i>GOV</i>	0.671 (5.06)	1.185 (5.27)	0.239 (3.05)	-0.105 (-0.93)
<i>GOV</i> * <i>BAD</i>	0.239 (2.96)	0.426 (3.29)	0.204 (1.56)	-0.220 (-1.73)
<i>GOV</i> * <i>GOOD</i>	-0.209 (-3.69)	-0.337 (-3.34)	0.042 (0.60)	-0.051 (-0.82)
<i>MB</i>	-0.119 (-5.61)	-0.118 (-5.57)	-0.122 (-5.71)	-0.117 (-5.54)
<i>STDROE</i>	0.076 (3.96)	0.077 (3.95)	0.077 (3.94)	0.076 (3.91)
<i>ROE</i>	-0.051 (-2.64)	-0.056 (-2.87)	-0.051 (-2.63)	-0.051 (-2.64)
<i>DYIELD</i>	0.082 (3.82)	0.083 (3.84)	0.076 (3.54)	0.078 (3.62)
<i>BSEGMENT</i>	-0.035 (-1.59)	-0.036 (-1.62)	-0.036 (-1.61)	-0.036 (-1.59)
<i>TURN</i>	-1.677 (-5.00)	-1.689 (-5.02)	-1.822 (-5.41)	-1.792 (-5.35)
<i>SIZE</i>	-0.461 (-21.10)	-0.460 (-20.85)	-0.467 (-21.28)	-0.465 (-21.13)
<i>ADR</i>	-0.184 (-4.44)	-0.182 (-4.37)	-0.184 (-4.41)	-0.177 (-4.25)
Industry & Year dummies	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
$\bar{R}^2$	0.398	0.398	0.397	0.396
N	5,744	5,744	5,744	5,744

Table 2.6 Effects of corporate governance at both the firm and country level on firm-specific stock return variation

This table reports country random effects regressions of price informativeness measure on country-level and firm-level corporate governance variables together with control variables including industry and year fixed effects. Dependent variable is logistically transformed firm-specific return variation, *LRSQ*. *CTRYGOV* alternatively denotes three different country governance indicators in the following. *COM_CIV* is a dummy variable, which takes value one if the country is in a common law regime, and zero if it is in a civil law regime from La Port et al. (1998). *ANTISELF* is the anti-self-dealing index from Djankov et al. (2006). *CIFAR* is a country information disclosure index from Bushman, Piotroski and Smith (2004). *STDROE* is the three-year standard deviation of return on equity preceding and including the given year. *ROE* is the return on equity. *DYIELD* is the dividend yield in percentage. *BSEGMENT* is the number of business segments one company operates in. *TURN* is the 12-month average number of shares traded scaled by the total number of shares outstanding. *SIZE* is the logarithm of the total assets in the millions of U.S. dollars. *ADR* is a dummy variable, which takes the value one if the company is cross listed in the U.S. market, and zero otherwise. *LOGGDPC* is the log of a country's GDP per capita and *MCAP* is a country's market capitalization scaled by current-year annual GDP. All control variables are standardized by subtracting the sample mean and dividing by the sample standard deviation. All firm-level variables except *GOV7* is winsorized at the 1% in both tails of the distribution. Standard errors are adjusted for clustering at the firm level. *t* statistics are shown in parentheses. $\bar{R}^2$ is the adjusted R^2 . Sample period is from year 2002 to year 2005.

<i>CTRYGOV</i> =	<i>COM_CIV</i>			<i>ANTISELF</i>		<i>CIFAR</i>	
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	1.163 (13.45)	1.438 (20.18)	1.288 (15.37)	1.163 (13.67)	0.923 (10.02)	-0.202 (-0.68)	-0.239 (-0.81)
<i>GOV7</i>	0.654 (7.24)		0.307 (3.26)		0.550 (6.04)		0.567 (6.17)
<i>MB</i>	-0.106 (-5.04)	-0.103 (-4.92)	-0.107 (-5.06)	-0.095 (-4.57)	-0.103 (-4.90)	-0.104 (-5.00)	-0.112 (-5.27)
<i>STDROE</i>	0.087 (4.13)	0.086 (4.19)	0.084 (4.07)	0.097 (4.67)	0.091 (4.39)	0.094 (4.46)	0.088 (4.20)
<i>ROE</i>	-0.044 (-2.17)	-0.045 (-2.29)	-0.046 (-2.35)	-0.039 (-1.98)	-0.043 (-2.14)	-0.039 (-1.95)	-0.042 (-2.13)
<i>DYIELD</i>	0.127 (6.52)	0.094 (4.75)	0.093 (4.75)	0.110 (5.57)	0.105 (5.36)	0.096 (4.65)	0.094 (4.57)
<i>BSEGMENT</i>	-0.105 (-4.91)	-0.049 (-2.24)	-0.045 (-2.01)	-0.084 (-3.80)	-0.067 (-3.00)	-0.088 (-3.87)	-0.072 (-3.12)
<i>TURN</i>	-1.666 (-5.35)	-1.971 (-6.32)	-1.958 (-6.28)	-2.076 (-6.44)	-2.059 (-6.41)	-2.097 (-6.47)	-2.064 (-6.36)
<i>SIZE</i>	-0.498 (-22.62)	-0.455 (-21.21)	-0.455 (-21.19)	-0.481 (-22.34)	-0.475 (-22.15)	-0.502 (-22.83)	-0.494 (-22.56)
<i>ADR</i>	-0.124 (-2.92)	-0.167 (-4.06)	-0.179 (-4.32)	-0.107 (-2.57)	-0.139 (-3.34)	-0.072 (-1.69)	-0.110 (-2.57)
<i>LOGGDPC</i>		0.209 (4.16)	0.190 (3.79)	0.261 (5.27)	0.218 (4.43)	0.141 (2.59)	0.115 (2.13)
<i>MCAP</i>		-0.148 (-6.44)	-0.142 (-6.24)	-0.126 (-5.33)	-0.123 (-5.29)	-0.066 (-3.05)	-0.070 (-3.26)
<i>CTRYGOV</i>		0.533 (11.07)	0.483 (9.41)	0.691 (7.03)	0.611 (6.15)	0.024 (5.97)	0.021 (5.00)
Industry & Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	No	No	No	No	No	No	No
$\bar{R}^2$	0.359	0.374	0.376	0.362	0.367	0.359	0.364
N	5,744	5,744	5,744	5,744	5,744	5,744	5,744

Table 2.7 Effects of country legal regime on the relation between firm-level corporate governance and firm-specific stock return variation

This table reports the country random effects regressions of price informativeness measure, *LRSQ* on corporate governance variables at the firm and country level and their interaction term together with unreported control variables. *GOV7* is the firm-level corporate governance rating. *CTRYGOV* alternatively represents *COM_CIV*, *ANTISELF* and *CIFAR*. *COM_CIV* is a dummy variable, which takes the value one if the country is in a common law regime, and zero if it is in a civil law regime from La Port et al. (1997). *ANTISELF* is anti-self-dealing index from Djankov et al. (2006). *CIFAR* is a country information disclosure index from Bushman, Piotroski and Smith (2004). We rank the firms on the basis of its corporate governance rating by country, by year in a pooled sample. Sample firms with ratings in the bottom 30 percentiles are classified into low quality governance group and those with ratings in the top 30 percentiles are classified into high quality governance group. *BAD* is a dummy variable coded one if the firm is in low quality governance group, and zero otherwise. *GOOD* is also a dummy variable coded one if the firm is in high quality governance group, and zero otherwise. *STDROE* is the three-year standard deviation of return on equity preceding and including the given year. *ROE* is the return on equity. *DYIELD* is the dividend yield in percentage. *BSEGMENT* is the number of business segments one company operates in. *TURN* is the 12-month average number of shares traded scaled by the total number of shares outstanding. *SIZE* is the logarithm of the total assets in the millions of U.S. dollars. *ADR* is a dummy variable, which takes the value one if the company is cross listed in the U.S. market and zero otherwise. All control variables are standardized by subtracting the sample mean and dividing by the sample standard deviation. All firm-level variables except *GOV7* is winsorized at the 1% in both tails of the distribution. Standard errors are adjusted for clustering at the firm level. *t* statistics are shown in parentheses. $\bar{R}^2$ is the adjusted $\bar{R}^2$. Sample period is from year 2002 to year 2005.

<i>CTRYGOV</i> =	<i>COM_CIV</i>		<i>ANTISELF</i>		<i>CIFAR</i>	
Model	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	1.201 (12.77)	0.972 (8.95)	0.614 (3.70)	0.355 (1.78)	-3.335 (-4.63)	-4.213 (-4.65)
<i>GOV7</i>	0.481 (3.83)	0.839 (4.90)	1.077 (4.29)	1.499 (4.49)	5.950 (5.32)	7.945 (5.16)
<i>GOV7*BAD</i>		0.452 (3.54)		0.816 (3.75)		2.288 (2.46)
<i>GOV7*GOOD</i>		-0.150 (-1.87)		-0.179 (-1.17)		-0.902 (-1.18)
<i>CTRYGOV</i>	0.733 (5.74)	0.679 (4.25)	1.162 (4.43)	1.136 (3.44)	0.062 (6.38)	0.070 (5.70)
<i>CTRYGOV*GOV7</i>	-0.403 (-2.15)	-0.326 (-1.29)	-0.895 (-2.31)	-0.834 (-1.61)	-0.071 (-4.82)	-0.091 (-4.51)
<i>CTRYGOV*GOV7*BAD</i>		-0.363 (-2.29)		-0.739 (-2.41)		-0.025 (-2.10)
<i>CTRYGOV*GOV7*GOOD</i>		-0.143 (-1.24)		-0.178 (-0.77)		0.008 (0.80)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry & Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	No	No	No	No	No	No
$\bar{R}^2$	0.376	0.380	0.368	0.374	0.367	0.375
N	5,744	5,744	5,744	5,744	5,744	5,744

Table 2.8 Alternative measure of stock price informativeness

This table reports the regressions of three alternative price informativeness measures on the firm-level governance rating, *GOV7* and its interaction with two dummy variables *BAD* and *GOOD*, together with control variables including industry, country and year fixed effects. *LRSQLEADLAG* is logistically transformed R^2 estimated based on two-factor international market model with two return lead-lags of Jin and Myers (2006). *LPIN* is logistically transformed probability of informed trading (PIN) of Easley, Kiefer, O'Hara and Paperman (1996). *TVRINFO* is private information trading measure of Llorente et al. (2002). We rank the firms on the basis of its corporate governance rating by country, by year in a pooled sample. Sample firms with ratings in the bottom 30 percentiles are classified into low quality governance group and those with ratings in the top 30 percentiles are classified into high quality governance group. *BAD* is a dummy variable coded one if the firm is in low quality governance group, and zero otherwise. *GOOD* is also a dummy variable coded one if the firm is in high quality governance group, and zero otherwise. *STDROE* is the three-year standard deviation of return on equity preceding and including the given year. *ROE* is the return on equity. *DYIELD* is the dividend yield in percentage. *BSEGMENT* is the number of business segments one company operates in. *TURN* is the 12-month average number of shares traded scaled by the total number of shares outstanding. *SIZE* is the logarithm of the total assets in the millions of U.S. dollars. *ADR* is a dummy variable, which takes the value one if the company is cross listed in the U.S. market and zero otherwise. The number of observations varies depending upon the data availability. All control variables are standardized by subtracting the sample mean and dividing by the sample standard deviation. All variables except *GOV7* is winsorized at the 1% in both tails of the distribution. Standard errors are adjusted for clustering at the firm level. t statistics are shown in parentheses. $\bar{R}^2$ is the adjusted R^2 . Sample period is from year 2002 to year 2005.

Dependent variable=	<i>LRSQLEADLAG</i>		<i>LPIN</i>		<i>TVRINFO</i>	
Model	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.729 (10.55)	0.510 (5.87)	-1.973 (-14.33)	-2.180 (-11.62)	0.017 (1.71)	0.004 (0.35)
<i>GOV7</i>	0.153 (2.49)	0.419 (4.83)	0.313 (2.29)	0.601 (2.99)	0.021 (2.22)	0.034 (2.55)
<i>GOV7*BAD</i>		0.130 (2.80)		0.073 (0.64)		0.011 (1.43)
<i>GOV7*GOOD</i>		-0.122 (-3.59)		-0.159 (-2.10)		-0.004 (-0.76)
<i>MB</i>	-0.059 (-5.12)	-0.058 (-5.06)	-0.025 (-1.20)	-0.024 (-1.13)	-0.003 (-1.48)	-0.003 (-1.46)
<i>STDROE</i>	0.038 (3.66)	0.038 (3.73)	0.035 (1.58)	0.035 (1.58)	0.000 (-0.22)	0.000 (-0.22)
<i>ROE</i>	-0.014 (-1.39)	-0.014 (-1.40)	-0.046 (-2.42)	-0.046 (-2.47)	-0.002 (-1.43)	-0.002 (-1.43)
<i>DYIELD</i>	0.041 (3.31)	0.043 (3.54)	-0.026 (-1.05)	-0.022 (-0.90)	0.001 (0.73)	0.001 (0.82)
<i>BSEGMENT</i>	-0.013 (-1.04)	-0.014 (-1.10)	0.012 (0.39)	0.012 (0.40)	0.001 (0.33)	0.001 (0.31)
<i>TURN</i>	-0.916 (-4.79)	-0.829 (-4.33)	-1.237 (-3.04)	-1.160 (-2.86)	-0.067 (-2.46)	-0.062 (-2.29)
<i>SIZE</i>	-0.261 (-19.55)	-0.258 (-19.38)	-0.136 (-4.92)	-0.131 (-4.72)	0.003 (1.74)	0.003 (1.83)
<i>ADR</i>	-0.132 (-5.08)	-0.132 (-5.08)	0.020 (0.37)	0.019 (0.36)	-0.002 (-0.60)	-0.002 (-0.61)
Industry & Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
$\bar{R}^2$	0.361	0.363	0.067	0.068	0.031	0.031
N	5,744	5,744	4,569	4,569	5,687	5,687

Table 2.9 Robustness checks

This table presents the regression results of a number of robustness tests. In Panel A, we regress firm-specific return variation, *LRSQ* on *GOV7* and the proxies for three better informed investors, respectively, together with control variables including industry, country and year fixed effects. Panel B shows the regression of logistically transformed firm-specific return variation measure, *LRSQ* on *GOV7* and its interaction term with *SGROWTH* and *LARGE* including industry, country and year fixed effects. *SGROWTH* is the annual sales growth rate from the previous year. *LARGE* is a dummy variable, which takes the value one if the firm size is above the median in a given country, and zero otherwise. *STDROE* is the three-year standard deviation of return on equity preceding and including the given year. *ROE* is the return on equity. *DYIELD* is the dividend yield in percentage. *BSEGMENT* is the number of business segments one company operates in. *TURN* is the 12-month average number of shares traded scaled by the total number of shares outstanding. *SIZE* is the logarithm of the total assets in the millions of U.S. dollars. *ADR* is a dummy variable, which takes the value one if the company is cross listed in the U.S. market, and zero otherwise. The number of observations varies depending upon the data availability. All control variables are standardized by subtracting the sample mean and dividing by the sample standard deviation. All variables except *GOV7* is winsorized at the 1% in both tails of the distribution. Standard errors are adjusted for clustering at the firm level. *t* statistics are shown in parentheses. $\bar{R}^2$ is the adjusted R^2 . Sample period is from year 2002 to year 2005.

Model	Panel A			Panel B	
	(1)	(2)	(3)	(4)	(5)
Intercept	1.995 (16.83)	1.964 (17.52)	2.088 (18.36)	1.997 (18.33)	2.010 (18.46)
<i>GOV7</i>	0.236 (2.33)	0.247 (2.52)	0.267 (2.76)	0.201 (2.10)	0.260 (2.55)
<i>MB</i>	-0.125 (-5.54)	-0.119 (-5.40)	-0.108 (-4.98)	-0.121 (-5.76)	-0.121 (-5.63)
<i>STDROE</i>	0.082 (3.89)	0.073 (3.56)	0.069 (3.43)	0.076 (3.90)	0.076 (3.92)
<i>ROE</i>	-0.052 (-2.64)	-0.060 (-3.12)	-0.025 (-1.21)	-0.057 (-2.89)	-0.052 (-2.67)
<i>DYIELD</i>	0.079 (3.40)	0.092 (4.16)	0.072 (3.32)	0.075 (3.47)	0.076 (3.55)
<i>BSEGMENT</i>	-0.038 (-1.59)	-0.040 (-1.74)	-0.054 (-2.47)	-0.035 (-1.56)	-0.034 (-1.53)
<i>TURN</i>	-1.872 (-5.36)	-1.086 (-3.15)	-1.743 (-5.01)	-1.810 (-5.40)	-1.773 (-5.22)
<i>SIZE</i>	-0.451 (-19.31)	-0.458 (-20.26)	-0.368 (-14.01)	-0.475 (-21.66)	-0.434 (-15.47)
<i>ADR</i>	-0.174 (-4.05)	-0.162 (-3.79)	-0.161 (-3.88)	-0.175 (-4.21)	-0.183 (-4.39)
<i>MFHOLDING</i>	0.359 (1.35)				
<i>CLOSELYHELD</i>		0.134 (6.50)			
<i>ANALYST</i>			-0.022 (-6.53)		
<i>SALESGROWTH</i>				0.141 (3.04)	
<i>SALESGROWTH*GOV7</i>				-0.221 (-3.10)	
<i>LARGE*GOV7</i>					-0.139 (-1.83)
$\bar{R}^2$	0.397	0.402	0.401	0.398	0.396
N	5,018	5,404	5,340	5,714	5,744

Chapter 3

Does strong corporate governance produce informative earnings announcements? The international evidence

Abstract

This study examines whether and how corporate governance affects market behavior around annual earnings announcements in 23 developed countries worldwide. Using detailed corporate governance data for the period 2002-2005, we find that companies that adopt better corporate governance practices experience stronger market price reactions. Evidence therefore suggests that effective corporate governance gives credibility to accounting earnings, thereby conveying more informative earnings announcements to the public. Furthermore, the results show that firm governance practices are at least as important as legal regulations in explaining market reactions around the announcements. Our cross-country analysis suggests that both

firm corporate governance and legal institutions are significantly associated with the magnitude of market reactions around earnings announcements. Particularly, regulations mandating financial disclosures are conducive to the informativeness of earnings announcements as perceived by investors.

3.1 Introduction

In this paper, we examine the relationship of firm and country investor protection and market reactions around earnings announcements on a sample of 17,223 firm-year observations across 23 developed countries for the period 2002-2005. Public earnings announcements are among the most important corporate announcements which resolve much of the uncertainty about stock pricing. However, to what extent stock prices reflect the information contained in the announcements is highly dependent on the level of the usefulness of the information perceived by the investors. Corporate governance - a form of protection for outside investors - could have a considerable impact on the perception of investors about firm-specific information releases. In a recent study, DeFond, Hung, and Trezevant (2007) find that market reactions to annual earnings announcements are stronger in countries with higher quality earnings or better enforced insider trading laws.

Prior research identifies investor protection institutions as a key factor affecting the informativeness of earnings announcements. As such, we focus on within-country variations in corporate governance practices as a factor in determining the quality of earnings announcements. We argue that a good corporate governance structure improves the credibility of earnings announcements, which brings about strong market reactions to annual earnings announcements of good governance companies. The reasons are twofold. First, a sound corporate governance system restricts the tendency of the management to conceal private control benefits, thereby reducing earnings manipulation and guaranteeing the quality of a company's accounting information (see Ball, Kothari, and Robin (2000); Leuz, Nanda, and Wysocki (2003)). Investors consider the message conveyed by good governance to be reliable and react strongly to announcements made by good governance companies. Second, an effective corporate governance mechanism can deter insider activities (see Ackerman and Maug (2006); Fernandes and Ferreira (2007)) including trading on private in-

formation prior to company public announcements. As a result, we expect strong market reactions at the time of earnings announcements.

While all these explanations predict strong market reactions to earnings announcements in strong corporate governance companies, the direction and magnitude of the effect is unknown. It is likely that firm corporate governance encourages the firm-specific information trading, which may lead to a high rate of earnings information incorporated into stock prices prior to the announcements (see Ferreira and Laux (2007)).⁶ In this situation, we could observe moderate market reactions to the announcements made by strong corporate governance companies. Moreover, given the importance of country-level disclosure requirements and supporting legal enforcement to market reactions around earnings announcements, there could be only minor effects of firm corporate governance on the usefulness of earnings announcements (see DeFond et al. (2007)). Thus, the relation between firm corporate governance and market reactions around earnings announcements is essentially an empirical issue.

The justification of investigating this research question in a cross-country context arises from the international corporate governance literature. On the one hand, numerous studies document that a company's corporate governance structure is not independent of the legal regime of its domicile country. Doidge, Karolyi, and Stulz (2007) show that governance mechanisms at the firm level can be most explained by country characteristics. It is possible that the effects of firm corporate governance on the quality of earnings announcements simply reflect the international differences in country legal environment. Corporate governance studies on single country settings ignore the impact of legal environment across the borders. On the other hand, country-level governance research work does not inform us on the within-country variations in corporate governance practices. Therefore, it is appealing to study the

⁶Ferreira and Laux (2007) show that few governance provisions that restrict the openness to control offers are associated with more informative stock prices, which efficiently incorporate the private information.

influence of corporate governance at firm and country level in one framework.

Our analysis is based on a sample of 17,223 annual earnings announcements from companies with detailed corporate governance data in 23 developed countries for the period 2002-2005. These corporate governance data are provided by the Institutional Shareholder Services (ISS) database. The ISS analysts daily update a spectrum of 55 governance attributes for these international companies in 23 developed countries. Unfortunately, there is no existing guideline for us to construct a reliable firm corporate governance index. Taking into consideration the potential trade-off between distinct corporate governance mechanisms (Gillian, Hartzell, and Starks (2006)), we follow Aggarwal, Erel, and Stulz (2007) and construct a corporate governance index consisting of 44 governance attributes. This comprehensive index reflects at least four aspects of corporate governance, namely, power of board, shareholder rights protection, audit-related provisions and executive compensation and ownership plans.

Besides the measure of corporate governance policy, another critical issue in this study is how to capture the information content of earnings announcements. We follow DeFond et al. (2007) and measure the informativeness of earnings announcements as the 3-day abnormal return variance around the announcement date, a higher value of which indicates more informative earnings announcements. The information of annual earnings announcements is obtained from I/B/E/S international database.

In order to verify the importance of country institutional effects, as a preliminary step, we first perform country-level analyses to test the association between market reactions around earnings announcements and four financial reporting structural factors that are identified by DeFond et al. (2007). The four structural factors are (1) financial disclosure; (2) timeliness of financial disclosure; (3) earnings quality; and (4) enforcement of insider trading law. We find that market reactions are stronger in

countries with higher quality of disclosure practice, more timely disclosure, and less earnings management. However, the effects of timely disclosure and earnings quality are subsumed by the quality of disclosure when the four factors are incorporated in one regression model.

Given the importance of a country's financial reporting factors, we further explore whether firm corporate governance produces more informative earnings announcements after controlling for country fixed effects. Specifically, we examine whether market reactions are stronger for good corporate governance companies on a sample of international companies from 23 developed countries. Our primary finding is in support of corporate governance associated with strong market reactions. The results of regressing market reactions measure around earnings announcement on firm governance score show that the intensity of market reaction increases with the effectiveness of a company's corporate governance structure. When a firm commits to strong corporate governance, the likelihood of insiders masking private control benefits and manipulating accounting earnings diminishes. As a result, investors tend to be more responsive to earnings announcements from good governance companies.

One concern arises because the positive effects of firm corporate governance on the credibility of earnings announcements may be attributable to the particular country's financial reporting regulations. For example, our preliminary tests at the country level suggest that market reactions around earnings announcements are stronger in countries characterized by higher quality of disclosure practice. Firms in these countries are more likely to establish a strict corporate governance structure as required. In an attempt to distinguish the relative importance of country-level and firm-level investor protection, we regress the market reactions measure on firm and country corporate governance measures in one regression framework. We note that the significant and positive association between firm corporate governance and the informativeness of earnings announcements persists in all of our country random

effects regression analyses. Among the aforementioned four structural factors, only the timeliness of financial disclosure and the quality of disclosure practice display a significant relation with the information content of earnings announcements after we control for firm corporate governance.

In conjunction with the four financial reporting variables, we extend our analysis by including three legal institutional variables in the country random effects regression models. The three legal institutional variables are disclosure requirements index, securities regulation index, and anti-director index. Disclosure requirements index and securities regulation index that are drawn from Hail and Leuz (2006) capture the cross-country differences in regulation mandating and enforcing disclosure. The revised anti-director index from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2006) is used as a proxy for the overall quality of a country's legal system. Most important, we find that the positive association between firm corporate governance and market reactions measure continues to hold after controlling for various country legal mechanisms. However, not all the components of legal institutions could affect the information content of earnings announcements. Specifically, regulation mandating disclosure (disclosure requirements index) is significantly related to the usefulness of earnings announcements while regulation enforcing disclosure (securities regulation index) and the overall quality of legal system (anti-director index) are not.

This paper contributes to the existing literature in several ways. First, we contribute to the accounting literature by providing a new explanation to market response to significant firm-specific information events. There exists an extensive literature offering reasons for the market behavior around firm information announcements in single countries and worldwide. Previous studies suggest that market reactions around earnings announcements can be attributed to factors such as analyst forecast precision (see Battalio and Mendenhall (2005)), and predisclosure information dissemination (see Vega (2006)). To our knowledge, there is only one

study by DeFond et al. (2007) that examines the relationship between country-level investor protection and market reactions around earnings announcements in an international setting. Current research has been silent on the differences in market response around earnings announcements among companies with distinct corporate governance practices. This study fills the gap by documenting a significant explanatory power of corporate governance to market reactions and further shows both firm-level and country-level investor protection are important to the formation of investor expectations at the time of earnings announcements.

Second, we identify an accounting channel through which corporate governance could add firm value. A large body of literature provides evidence of a positive association between firm-specific corporate governance and firm valuation in single countries (see Gompers, Ishii, and Metrick (2003); Baek, Kang, and Park (2004)) and across countries (see Klapper and Love (2005); La Porta, Lopez-De-Silanes, Shleifer, and Vishny (LLSV) (2002); Durnev and Kim (2005)). However, the causality between corporate governance and firm valuation is of much debate. Recent studies such as Core, Guay, and Rusticus (2006) and Lehn, Patro, and Zhao (2006) argue that the causation running valuation to governance, not vice versa. In contrast to Core, Guay, and Rusticus (2006), our results show that market, at least, does not fully anticipate the good operating performance of strong governance firms. Firms with effective corporate governance realize stronger market reactions, which indicates more useful earnings announcements from the perspective of outside investors. Subsequently, the rich information conveyed through earnings announcements could reduce the information risk borne by investors. This may in part explain the value-enhancing effect of corporate governance (Hail and Leuz (2006)).⁷

Finally, we conduct several robustness tests. For one, we are concerned about estimation approaches that we use to capture the short-window market reactions. To

⁷Hail and Leuz (2006) assess international differences in cost of equity for firms across 40 countries. The results support the conclusion that firms from countries with stricter regulation mandating and enforcing disclosure have a significantly lower cost of capital.

substantiate previous findings, we estimate abnormal returns around the earnings announcement by two-factor international market model instead of local market model for non-US firms. We rerun the hypothesis tests using the new measure, but our results do not appear sensitive to the model specifications. Second, admittedly, besides the U.S. firms, Japanese and U.K. firms account for the largest observations in our sample. It is possible that our results merely capture the market impact of corporate governance that prevails in these two countries. Therefore, we split our non-US global sample into two subsamples, one with only Japanese and U.K. companies and the other without these companies. Again, our results continue to hold in both of the two subsamples. Lastly, we examine whether our results are sensitive to the event window that we rely on in the previous tests. We alternatively estimate abnormal return variance in a five-day or ten-day window relative to the earnings announcement date. However, our previous findings remain unchanged.

The remainder of the paper is organized as follows. We describe data in the next section. In Section 3.3, we present the empirical results of our hypothesis tests. We perform a number of robustness checks in Section 3.4. The conclusion is drawn in Section 3.5.

3.2 Data description and sample construction

Our sample comes from the following six data sources: firm governance attributes information from the ISS; annual earnings announcement dates and analysts information from I/B/E/S; trading-related data from Datastream; non-US firm financial characteristics data from Worldscope; U.S. firm financial characteristics data from COMPUSTAT; and country characteristics data from the World Bank’s World Development Indicators (WDI). Due to the availability of the ISS corporate governance data, our sample period ranges from 2002 to 2005.

3.2.1 Measures of corporate governance

We base our tests on a unique and detailed corporate governance dataset for the period 2003-2006 provided by the ISS. However, we regard the sample period ranging from 2002 to 2005 due to the fact that the corporate governance information collected by ISS for the year reflects the corporate governance experience of the year before (see Aggarwal et al. (2007)). To generate a corporate governance index, the ISS analysts track the publicly disclosed documents and provide daily updates for a comprehensive spectrum of 55 different governance attributes for companies from 23 developed countries. It should be noted that the ISS database covers a wide range of companies in the U.S., which accounts for 21,304 firm-years. However, non-US firms that are covered by the ISS are generally large sized, which are part of one of the following indices: Russell 3000, S&P 500, S&P 400, S&P 600, MSCI's EAFE (Europe, Asia and Far East) index and S&P's Composite TSX index (Canada). There is considerable overlap between these indices. In total, there are only 8,020 firm-years in the other 22 developed countries (excluding the U.S.). Among the 22 developed countries considered, the United Kingdom and Japan firms account for the largest observations.

Following the previous studies (see Gompers, Ishii, and Metrick (2003); Bebchuk and Cohen (2005)), we adopt a widely accepted additive system to measure the quality of a firm's corporate governance structure in one single figure. The ISS data manual provides us with the minimal acceptable standard on each corporate governance attribute. Our governance index takes a value of one if the firm meets the minimal acceptable standard on that attribute, and zero otherwise. We exclude the attribute if the governance information regarding the attribute is unavailable. For each company, the rating in the governance index is computed as the number of criteria met by the company in that particular index, divided by the total number of non-missing attributes in the same index.

Gillian, Hartzell, and Starks (2006) point out the trade-off between different corporate governance mechanisms adopted by the companies. In other words, different mechanisms can provide similar governance functions.⁸ In light of this study, we attempt to design a comprehensive governance index. We follow Aggarwal et al.(2007) and construct an index incorporating 44 governance attributes for each firm in the sample. We term this firm-level governance rating as *GOV44*. It reflects several important aspects of corporate governance practices including power of board, shareholder rights protection, audit-related provisions and executive compensation and ownership plan.

Table 3.1 provides details about the 44 corporate governance attributes incorporated in the construction of our firm corporate governance index. These 44 governance provisions are ranked based on the percentage of firms meeting the standard in a full sample of 29,324 firm-year observations. Some provisions seem to be required by the government as we observe the vast majority of firms in our sample satisfy the following governance standards: (1) company does not ignore shareholder proposal; and (2) no interlocks among compensation committee members.

On the contrary, a few governance attributes seem to receive very little attention in the sample firms. From Table 3.1, we observe that there are less than 10% of the companies in the sample that meet the following three provisions: (1) there is a policy on outside directorships; (2) shareholders have cumulative voting rights; and (3) the company qualifies for proxy contest defenses combination points. In the last two columns of Table 3.1, we split the full sample into global subsample and U.S. subsample. Interestingly, remarkable differences exist between corporate governance structures in the U.S. versus other countries around the world. For example, all directors attended 75% of board meetings or had a valid excuse for 99.7% of firms in our U.S. subsample contrast to only 76.4% of firms in our global subsample. The

⁸Gillian, Hartzell, and Starks (2006) document that firms that have powerful board (as measured by board independence) also adopt the greatest number of charter provisions, which indicates a substitutability between market for corporate control and board power.

international discrepancy in corporate governance provisions signifies the importance of examining corporate governance mechanisms in an international setting. Those provisions that prevail in the U.S. might not be as important in the companies around the world.

As noted above, corporate governance mechanisms vary markedly around the world. We cannot draw solid conclusions on the effects of firm corporate governance unless we analyze the significance of country-level and firm-level governance simultaneously. Thus, in addition to firm corporate governance measure, we appeal to the literature for valid measures for country-level corporate governance. To avoid our results driven by variable selection bias, we consider four financial reporting variables, two regulation variables and one overall legal environment variable in this study.

First, following DeFond et al. (2007), we consider four financial reporting structural factors, that is, timeliness of financial disclosure, enforcement of insider trading law, earnings quality and quality of financial disclosure. DeFond et al. (2007) use the frequency of interim reporting as a proxy for disclosure timeliness. However, their sample does not cover countries like New Zealand, Greece, and Ireland which are included in our sample. To avoid unnecessary loss of observations, we alternatively use the timeliness of financial information index from Bushman, Piotroski and Smith (2002) to capture how quickly the financial information is disclosed to the public. Following Bhattacharya and Daouk (2002), we measure the effectiveness of insider trading law enforcement using a dummy variable which is equal to one if the first insider trading case is brought to court by the end of 1999 and zero otherwise.⁹ In our sample, only Austria, Ireland, New Zealand, and Portugal have not enforced the insider trading law by the end of 1999. The quality of financial disclosure is measured by the accounting disclosure index that are reported in Center for International Financial Analysis & Research (1995). The last factor that cap-

⁹Insider trading law enforcement data in Bhattacharya and Daouk (2002) end in 1999.

tures earnings quality in a country comes from Leuz, Nanda, and Wysocki (2003) and is calculated as the earnings management score multiplied by -1. We note that earnings management score is not available for New Zealand.

On basis of the four structural factors, we extend our analysis by including three legal institutional variables, namely, disclosure regulation index, securities regulation index, and anti-director index. The first two regulation metrics are created in Hail and Leuz (2006) on the basis of a widely cited study by La Porta, Lopez-de-Silanes, and Schleifer (2006). Disclosure regulation index is rules based and captures the rules mandating firms' disclosure practice. On the other hand, securities regulation index scores the effectiveness of regulations enforcing the disclosure rules. The last legal institutional measure, the newly updated anti-director index from Djankov et al. (2006), reflects the quality of overall legal system.

3.2.2 Earnings announcements informativeness measure and other control variables

The ISS database keeps records of 29,324 firm-year observations with detailed firm corporate governance data in 23 countries for the period 2002-2005. In the regression analysis, we exclude firms operating in highly regulated industries including utilities, transportation, telecommunication service, insurance, energy, and banks. This filter reduces our sample size from 29,324 to 22,338 firm-year observations. We also eliminate firms with missing financial data and trading data around earnings announcements each year. Our final sample includes 17,223 firm-year observations. The financial and trading variables employed in this study are discussed in more detail as below.

First, we use abnormal return variance in a three-day window $(-1, 1)$ with respect to the earnings announcement date as a proxy for the information content of earnings announcements (see DeFond, Hung and Trezevant (2007)). It is calculated as the

stock return variance in the event window, divided by the stock return variance in the estimation window. Stock return variance in the event window is equal to the average of the squared prediction errors from the market model in the three-day event window $(-1, 1)$ relative to the announcement date. Stock return variance in the estimation window is equal to the variance of prediction errors from the local market model estimated in an estimation window $(-120, -21)$. Panel B of Table 3.2 finds that the average market reactions (VAR) around earnings announcements is highest in Denmark and lowest in Portugal.

In addition, we search prior research in an attempt to find a variety of control variables that might affect or even subsume the significant relationship between firm corporate governance and market reactions around earnings announcements.

U.S. cross-listings An extensive literature documents increased disclosure after foreign companies were cross listed on the U.S. stock exchanges. Most closely related to our study, Baily, Karolyi, and Salva (2006) find increased market reactions around earnings announcements after foreign companies listed the shares in the U.S. Thus, we use an ADR (American Depositary Receipts) dummy as a proxy to control for the likely change in a company’s accounting disclosure practices after listed on the U.S. exchanges. The ADR dummy equals to one if the company cross-listed the shares in the U.S. market, and zero otherwise. The information about the U.S. cross-listings is obtained from the following institutions: Citibank, Bank of New York, JP Morgan, and Deutsche Bank (Cross listing information about Canadian firms are directly collected from the U.S. stock exchanges).

Analyst following Prior research suggests that high quality of disclosure improves the firm’s information environment, which causes the stock prices to more efficiently reflect firm-specific information (see Fernandes and Ferreira (2007); Bailey, Karolyi, and Salva (2006)).¹⁰ Thus, it is straightforward to show that pre-announcement

¹⁰Both of the studies highlight the importance of corporate high-quality disclosure after U.S. cross-listing. Fernandes and Ferreira (2007) document that stock price informativeness increases after the cross-listing. Bailey, Karolyi, and Salva (2006) find that market reaction around annual

information dissemination could weaken market reactions at the time of earnings announcements. Security analysts are regarded as better informed investors, who specialize in gathering and processing firm information. For example, Piotroski and Roulstone (2004) show that the number of analyst following increases with the amount of public information incorporated in stock prices. Therefore, following Hong, Lim, and Stein (2000) and several subsequent studies, we measure the information held by analysts as the number of analysts covering the company around the earnings announcement. The analyst activity data are obtained from historical I/B/E/S database. As shown in Table 3.2, most firms in our sample are heavily followed by security analysts. For instance, there are, on average, about 15 analysts covering each of the firms in Germany.

Earnings reporting lag The information about earnings is likely to be disseminated prior to the earnings announcement date given a long earnings reporting lag (see Chambers and Penman (1984)). Following DeFond, Hung and Trezevant (2007), we use the number of days from the fiscal year-end to the earnings announcement date reported by I/B/E/S as a proxy for earnings reporting lag. Among the 23 developed countries in our sample, Greece has the longest reporting lag (145 days, see Panel B of Table 3.2).

Reporting loss We also control for the reporting losses, as accounting earnings tend to be less informative when the firm reports negative earnings (see Hayn (1995)). Following Ashbaugh-Skaife, Gassen, and LaFond (2006), we use a *LOSS* dummy to capture the reporting loss, which takes a value of one if net income before extraordinary items is negative, and zero otherwise.

Other control variables The remaining control variables include market-to-book ratio (*MB*) and firm size (*SIZE*). The two firm-level variables capture the missing cross-sectional differences in sample firm characteristics. In the country random

earnings announcements is stronger after a company cross-lists in the U.S., suggesting the positive changes in the individual firm's information environment.

effects regression model, we further control for the equity market development and country economic development. The level of equity market development is measured as the current year market capitalization scaled by annual GDP. Economic development is captured by the log of current year GDP per capita. The country characteristics data are obtained from the WDI database.

Table 3.3 exhibits the correlation coefficients among variables at the country and firm level. Panel A shows the correlation coefficients among country-level variables. Due to the fact that our sample covers merely developed countries, it is not surprising that observe moderate/strong correlation coefficients among legal institutional factors. For example, the correlation coefficient between earnings quality score and disclosure timeliness score is as high as 0.653. The high correlation raises concerns about multicollinearity and prompts us to separately analyze the effects of the two factors on market reactions around earnings announcements in the multivariate analysis.

Panel B of Table 3.3 reports the simple correlations between firm-level variables. Our primary dependent variable (*VAR*) is positively and significantly related to our firm corporate governance measure (*GOV44*), the correlation coefficient of which is 0.116 (p value is 0.00). This finding gives us confidence to further explore the relationship between firm corporate governance practices and market reactions around earnings announcements. Furthermore, there seem to be no strong correlations among control variables, which indicate that our firm-level analyses are unlikely to be biased by multicollinearity problem.

3.3 Empirical tests

We posit that market reactions to earnings announcements increase with the level of investor protection at the country and firm level. For ease of comparison, we adopt the same model as DeFond et al.(2007) to examine the impact of country-level

investor protection on market responses at the time of earnings announcements. At the firm level, we model market reactions as a function of firm corporate governance rating and a firm's financial characteristics. The baseline OLS regression model is specified as below.

$$\begin{aligned} VAR = & \alpha_1 + \beta_1 GOV44 + \beta_2 ADR + \beta_3 ANA + \\ & \beta_4 RLAG + \beta_5 LOSS + \beta_6 MB + \beta_7 SIZE + \varepsilon. \end{aligned} \quad (3.1)$$

VAR is defined as abnormal return variance in a three-day window $(-1, 1)$ relative to the earnings announcement date, where return variance is estimated based on local market model. Our primary testing variable is firm corporate governance rating ($GOV44$). Control variables include a U.S. cross-listing dummy (ADR), the number of analysts (ANA), earnings reporting lag ($RLAG$), reporting loss dummy ($LOSS$), market-to-book ratio (MB), and firm size ($SIZE$). We also control for industry, country and year dummies in the model.

3.3.1 Main regression results

We begin with verifying the importance of four financial reporting structural factors identified in DeFond et al. (2007) by conducting several country-level tests based on a sample of 23 developed countries. In Table 3.4, we first regress the country average of market reactions measure (VAR) on different combinations of the four structural factors. That is because Panel A of Table 3.3 shows high correlations between the four factors. The number of observations varies due to the fact that we cannot find a corresponding earnings management score for New Zealand in Leuz, Nanda, and Wysocki (2003). Moreover, we capture the timeliness of accounting disclosure by using the timeliness of disclosure index from Bushman, Piotroski, and Smith (2004) instead of the frequency of interim reporting in a given country to avoid the loss of observations.

The signs of each of the four structural factors as predicted by DeFond et al. (2007) are shown in the first column of Table 3.4. Results in Models (1)- (4) of Table 3.4 show that market reactions measure, VAR , is positively related to the timeliness of financial disclosure index ($TIME$), earnings quality index (EM), and quality of disclosure (CR). However, only the coefficient of CR is significant when the four structural factors are simultaneously included in Model (5). In DeFond et al. (2007), all of the factors significantly affect the information content of earnings announcements. The change of results may be attributable to the sample selection. Our sample is only restricted to developed countries, which are assumed to have better financial disclosure regulations and practices than emerging markets. Despite the different results, we can confirm that certain country characteristics such as financial disclosure quality (CR) significantly strengthen the usefulness of earnings announcements.

We then proceed to test the hypothesis that firm corporate governance provides the credibility to accounting information, which leads to strong market reactions around the announcements. If this conjecture is true, we expect the coefficient of $GOV44$ is positive and statistically significant in equation (3.1).

Table 3.5 exhibits the OLS estimation results of equation (3.1). In Models (1) and (2) of Table 3.5, we regress market reactions measure, VAR , on $GOV44$ and a series of control variables on the entire sample with and without analyst forecast precision controls. Consistent with our prediction, both models find a significantly positive association between $GOV44$ and VAR . Specifically, in Model (1), one percentage increment in $GOV44$ corresponds to 226 basis points increment in VAR . The positive relation is significant at any conventional significance level (t statistic is 3.84). We also note that our findings of control variables are generally consistent with DeFond et al. (2007). Specifically, market reactions are stronger for firms with more analyst following, firms with less earnings reporting lag, and firms that do not realize reporting losses.

To better control for the pre-announcement disclosure, we include two analyst forecast precision variables in Model (2). One variable is the analyst forecast dispersion (*DISP*), calculated as the standard deviation of analyst forecasts deflated by the mean forecast. The other variable is the magnitude of earnings surprises as measured by the absolute value of the difference between actual earnings per share and the mean forecast deflated by the standard deviation of earnings forecasts. All the analyst activities data are taken from I/B/E/S. As we can see from Model (2), the number of observations reduce substantially after controlling for the two variables. Firms with bigger earnings surprises realize stronger market reactions. However, the significant association between market reactions and firm corporate governance score is not sensitive to the inclusion of analyst forecast precision controls.

Admittedly, U.S. companies dominate our sample observations. To check the sample selection bias, we split the sample into U.S. subsample and non-US subsample (Global subsample). Throughout Models (3) -(6), the intensity of market reactions increases with firm corporate governance score, *GOV44*. The effect of firm corporate governance seems to be stronger among non-US companies. For example, Model (3) finds that the coefficient of *GOV44* is as high as 3.819 (*t* statistic is 3.09) versus 1.405 (*t* statistic is 1.99) on the U.S. subsample (see Model (5)). Again, these results are robust to the inclusion of analyst forecast precision variables (see Models (4) and (6), Table 3.5).

One concern arises from the signs of earnings surprises. Skinner and Sloan (2002) provide evidence of growth stocks exhibiting an asymmetric price response to earnings surprises. We also test whether our findings would be driven by the sign of earnings surprises. In particular, we split our full sample into two subsamples on the basis of the direction of earnings surprise. Following previous studies, we define the event as a good (bad) news if actual earnings per share is above (below) the mean analyst forecast from I/B/E/S database. The untabulated results show that the relation between our market reactions measure (*VAR*) and *GOV44* continues to

hold, regardless of a good news or a bad news. In addition, there exist no differential effects of firm corporate governance on the magnitude of market reactions across the two earnings surprises subsamples.

In summary, our preliminary results thus far are in favor of our hypothesis, which states that firms that commit to good corporate governance practices realize strong market reactions around earnings announcements. The primary findings are not driven by various firm characteristics, pre-announcement information environment, and the sign of earnings surprises.

3.3.2 Legal environment, firm corporate governance, and market reactions

The study of corporate governance becomes complex in an international context. The wide variations in firm corporate governance practices may in part come from the differences in legal regulations or common practices in a given country. Based on the findings in Table 3.4, at least the four structural factors considered in DeFond et al. (2007) are relevant to market reactions at the time of earnings announcements. To compare the relative importance of firm and country investor protection mechanisms, we extend our baseline regression model by including the country characteristics using the following equation:

$$\begin{aligned}
 VAR = & \alpha_1 + \beta_1 GOV44 + \beta_2 ADR + \beta_3 ANA + \\
 & \beta_4 RLAG + \beta_5 LOSS + \beta_6 MB + \beta_7 SIZE + \\
 & \beta_8 TIME + \beta_9 INS + \beta_{10} EM + \beta_{11} CR + \\
 & \beta_{12} CTRYGOV + \beta_{13} MCAP + \beta_{14} GDP + \varepsilon
 \end{aligned} \tag{3.2}$$

where *CTRYGOV* alternatively represents three different country governance proxies (disclosure requirements index, securities regulation index, and anti-director index) as discussed in Section 3.2. Equation (3.2) augments the regression model

specified in equation (3.1) with country governance measures and country characteristics. In equation (3.2), we also control for the timeliness of disclosure (*TIME*), insider law enforcement (*INS*), earnings quality (*EM*), and disclosure quality (*CR*), and two country characteristics controls (*GDP* and *MCAP*). Only industry dummies and year dummies are included due to the fact that country-level factors we study are constant over time.

Table 3.6 summarizes the estimation results of equation (3.2) with the dependent variable of *VAR*. Model (1) first confirms the significant effect of firm corporate governance to market reactions around earnings announcements using the country random effects regression. In the following, Models (2) and (3) explore the effects of the four structural factors that we considered in Table 3.4. The results suggest that firms from countries with less timely but high quality experience stronger market reactions. The timeliness of disclosure weakens the market reactions because it could accelerate private information dissemination prior to the announcements. However, in countries with higher quality of disclosure, firms are more likely to release more useful information at the earnings announcements, which results in stronger market reactions (see Francis, Schipper, and Vincent (2002)). In addition to the structural factors, we also note that firm corporate governance rating is still significantly and positively correlated with (*VAR*).

Building on the four financial reporting structural factors, we extend our analysis by considering three additional legal institutional factors, namely, the newly updated anti-director index (*DIR*), disclosure requirement index (*DIS*), and securities regulation index (*SEC*) in Models (4)-(9). Models (4), (6), and (8) present the results without the presence of firm corporate governance. Interestingly, we find that not all the legal institutions have an impact on market reactions around earnings announcements. Only regulation mandating disclosure requirements (as measured by *DIS*) weakens market reactions at the time of announcements. The quality of overall legal system (*DIR*) and the regulation enforcing disclosure (*SEC*)

does not appear to be important.

In an attempt to capture the differential effects of firm and country investor protection, we incorporate both firm and country investor protection measures in one regression model (see Models (5), (7) and (9)). We note that the coefficient of *GOV*⁴⁴ is significant and positive in all of the regression estimations. Moreover, the effects of country legal institutional factors remain unchanged.

Taken together, in a cross-country analysis, firm corporate governance practice is at least as important as a country's legal forces in fostering informative earnings announcements. It is also noteworthy that not all the components of a country's legal system play a significant role on the information content of earnings announcements. However, we have to interpret the results with caution because our sample only includes companies from developed countries.

3.4 Robustness tests

Thus far, our cross-sectional regression results suggest that firm and country corporate governance have a significant impact on market reactions around earnings announcements. However, there are concerns about the specific event window we rely on and the measurement of market reactions. We address these issues in this section to confirm our previous findings.

First, it is likely that our results can only apply to a three-day event window relative to the earnings announcement date. To rule out this possibility, we repeat the hypothesis tests in Table 3.5 by estimating the abnormal return variance over a five-day window $(-2, 2)$, and a ten-day window $(-5, 5)$, relative to the announcement date. We find that the previous findings continue to hold.

Furthermore, it is arguable that our results might be driven by other factors such as model selection and sample bias. To assure that our results are not affected by the

models we choose, we reestimate abnormal return variance for non-US firms using a two-factor international market model. The reason follows that the local market is likely to comove with the U.S. market (see Morck, Yeung and Yu (2000) and Fernandes and Ferreira (2007)). The unreported results show that the significance of firm corporate governance to market reactions remain unchanged.

Admittedly, Japan and U.K. firms account for a large amount of observations in our global subsample (excluding the U.S. firms). Thus, we conduct robustness tests to check the relationship between market reactions measure and *GOV44* by splitting global sample into two subsamples, one with Japan and UK firms and the other without Japan and UK firms. However, the significant relation between firm corporate governance and market reactions still holds in both of the subsamples.

3.5 Conclusion

In this paper, we examine the relationship from corporate governance to the informativeness of earnings announcements by evaluating the impact of firm and country corporate governance on market reactions around the earnings announcement date in an international context.

Our study is most closely related to DeFond et al. (2007). They highlight the importance of financial reporting requirements on the information content of earnings announcements. We extend their study by investigating to what extent firm corporate governance could affect the informativeness of earnings announcements. Our primary finding is consistent with the notion that investor protection at the firm level gives credibility to annual earnings announcements, thereby leading to strong market reactions around earnings announcements. Specifically, firms that commit to better corporate governance structure realize stronger market reactions. Although previous studies such as Morck, Yeung, and Yu (2000) and Ferreira and Laux (2007) establish the long-window link between corporate governance and cor-

porate information environment, our study performs an event study and provides one channel through which corporate governance can give rise to a better information environment. Corporate governance could facilitate the information communication between the management and outside investors through producing credible corporate announcements such as annual earnings announcements.

Further, we compare the relative importance of firm corporate governance and country legal environment with regard to market reactions around earnings announcements. One limitation of corporate governance study in single countries is that some variables are constant within countries. Our sample overcomes this problem and allows us to investigate the impact of both legal rules and firm governance practices in one framework. We find that firm governance practice is at least as important as country legal institutional factors in generating an informative earnings announcement. Specifically, firm corporate governance measure, *GOV44*, is significantly and positively associated with market reactions measure even after controlling for legal institutions. Moreover, not all the components of a country's legal system plays a significant role in generating useful earnings announcements. For instance, our results suggest that regulation enforcing financial disclosure seems not important when it comes to the informativeness of earnings announcements.

Besides contributing to the existing literature, there are policy implications of this study. For one, our study prompts the necessity of establishing a good internal corporate governance structure even in countries with good legal institutions in place. Our results show that firm corporate governance can not be substituted by legal investor protection from the perspective of investors. Hence, to reduce the cost of raising capital, companies in need of external financial may consider to establish an effective corporate governance structure. Moreover, our study highlights the importance of corporate governance as perceived by outside investors. To attract investment as a result of corporate information announcements, policymakers and companies should be wary of the extent of investor protection which has an impact

on the investment gains.

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Table 3.1 Corporate governance index

This table presents the composition of overall corporate governance index (*GOV44*) we use throughout the empirical tests. For each attribute, we report the percentage of firms meeting the minimally acceptable standard. The percentage is computed over the total number of non-missing observations for each attribute. The full sample includes the 29,324 firm-year observations across 23 developed countries for the period 2002-2005. The global sample includes 8,020 firm-year observations from outside the U.S. The U.S. sample includes 21,304 firm-year observations in the U.S.

Minimally acceptable corporate governance standard	Full sample	Global sample	US sample
1. Does not ignore shareholder proposal	99.7%	99.9%	99.6%
2. No interlocks among compensation committee members	99.7%	98.9%	99.8%
3. All directors attended 75% of board meetings or had a valid excuse	96.6%	76.4%	99.7%
4. CEO serves on the boards of two or fewer public companies	95.7%	88.6%	97.7%
5. Single class, common	93.3%	92.1%	93.8%
6. All stock-incentive plans adopted with shareholder	87.9%	93.1%	86.0%
7. CEO is not listed as having a related-party transaction in the proxy statement	83.4%	91.8%	80.9%
8. Board size is at greater than five but less than 16	82.2%	83.3%	81.8%
9. All directors with more than one year of service own stock	80.2%	54.1%	88.2%
10. Consulting (audit related and other) fees are less than audit fees	79.7%	57.5%	86.0%
11. No former CEO on the board	78.0%	73.6%	79.5%
12. Company either has no poison pill or a pill that was shareholder approved	74.8%	98.8%	65.8%
13. Directors receive all or a portion of their fees in stock	73.7%	29.8%	84.6%
14. Board is controlled by more than 50% independent outside directors	72.9%	31.9%	86.3%
15. Audit committee comprised solely of independent outsiders	69.8%	30.5%	84.5%
16. Shareholders may call special meetings	65.0%	98.9%	50.4%
17. Board has the express authority to hire its own advisors	63.7%	39.2%	72.9%
18. Chairman and CEO are separated or there is a lead director	62.9%	88.8%	55.7%
19. Shareholders vote on directors selected to fill vacancies	61.9%	76.0%	56.2%
20. Auditors ratified at most recent meetings	61.8%	53.5%	65.0%
21. Officers' and directors' stock ownership is at least 1% but not over 30% of total shares outstanding	61.5%	26.0%	71.4%
22. Compensation committee comprised solely of independent outsiders	60.6%	24.9%	74.0%
23. Repricing is prohibited	58.9%	61.0%	58.2%
24. Majority vote requirement to approve mergers	55.4%	10.5%	74.8%
25. Options grants align with company performance and the burn rate is reasonable	54.8%	65.7%	52.3%
26. Performance of the board is reviewed regularly	45.2%	35.8%	48.8%
27. Nominating committee comprised solely of independent outsiders	44.7%	13.9%	56.3%
28. Annually elected board	43.0%	31.9%	47.2%
29. Executives are subject to stock ownership guidelines	42.8%	50.2%	40.0%
30. Governance committee exists and met in the past year	37.4%	13.8%	46.3%
31. Company is not authorized to issue blank check preferred	35.8%	94.5%	13.7%
32. Majority vote requirement to amend charter/bylaws	35.6%	3.4%	48.4%
33. Board approved succession plan in place for the CEO	30.3%	16.6%	35.5%
34. Board cannot amend bylaws without shareholder approval or can only do so under limited circumstances	28.8%	99.0%	2.3%
35. Shareholder approval is required to increase/decrease the size of the board	26.4%	68.8%	8.0%
36. Outside directors meet without the CEO and disclose the number of times they met	25.9%	7.1%	32.9%
37. Shareholder may act by written consent	21.8%	10.1%	24.0%
38. Company expenses options 82	15.8%	40.0%	6.6%
39. Directors are required to submit resignation upon a change in job	13.8%	1.5%	18.5%
40. Directors are subject to stock ownership requirements	13.2%	11.7%	13.7%
41. Executives are subject to stock ownership guidelines	12.9%	14.6%	12.3%
42. There is a policy on outside directorships (4 or fewer boards is the limit)	6.5%	3.2%	7.8%
43. Shareholders have cumulative voting rights	5.9%	1.0%	7.7%
44. Qualifies for proxy contest defenses combination	4.3%	0.2%	5.9%

Table 3.2 Descriptive statistics

This table gives descriptive statistics of the variables used in this study. Panel A presents the number of observations (N), and mean values of a series of country characteristics variables in each country for the sample period 2002-2005. *TIME* from Bushman, Piotroski, and Smith (2004) measures the timeliness of financial disclosure in a country. *INS* is a dummy variable which takes a value of one if the country enforced the insider trading law by the end of 1999. We obtain the information on the year during which the first legal case is brought against insider trading from Bhattacharya and Daouk (2002). *EM* is the aggregate earnings management score from Leuz, Nanda, and Wysocki (2003) multiplied by -1. Disclosure index (*CR*) from Bushman, Piotroski, and Smith (2004) measures the financial disclosure practice in a country. *DIR* denotes revised anti-director index from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2006). Disclosure requirement index (*DIS*) and securities regulation index (*SEC*) from Hail and Leuz (2006) measure the regulations mandating and enforcing disclosure, respectively. *MCAP* is a country's equity market capitalization scaled by current year GDP. *GDP* is the log of a country's annual GDP per capita. Panel B presents the means of firm-level variables in each country. *GOV44* is the firm corporate governance rating as described in Table 3.1. *ADR* is a dummy variable, which takes a value of one if the firm is cross listed in the U.S. market, and zero otherwise. *ANA* is the number of analysts that follow the stock of the firm at the time of the announcement. *RLAG* is the number of days from the fiscal year-end to the earnings announcement date reported by I/B/E/S. *LOSS* is a dummy variable which takes a value of one if the net income is less than zero and zero, otherwise. *MB* is a firm's market to book ratio. *SIZE* is the log of a firm's stock market capitalization in the millions of U.S. dollars. All firm-level variables except *GOV44* is winsorized at the 1% in both tails of the distribution.

Table 3.2 - Continued
Descriptive statistics

Panel A: At the Country Level											Panel B: At the Firm Level							
COUNTRY	N	TIME	INS	EM	CR	DIR	DIS	SEC	MCAP	GDP	VAR	GOV44	ADR	ANA	RLAG	LOSS	MB	SIZE
Australia	296	89.13	1	-4.8	80	4	0.75	0.77	107.80	10.31	3.14	0.49	0.21	7.88	52.91	0.07	2.67	7.31
Austria	39	68.12	0	-28.3	62	2.5	0.25	0.18	25.54	10.36	2.25	0.42	0.44	3.85	98.05	0.05	1.49	6.64
Belgium	72	63.04	1	-19.5	68	3	0.42	0.34	105.45	10.32	3.96	0.39	0.15	8.51	82.51	0.13	1.78	7.54
Canada	509	99.28	1	-5.3	75	4	0.92	0.91	108.78	10.35	2.76	0.66	0.51	8.49	51.58	0.22	2.51	7.14
Denmark	55	73.91	1	-16.0	75	4	0.58	0.50	57.61	10.36	6.45	0.43	0.22	10.33	64.49	0.13	3.15	7.40
Finland	88	78.99	1	-12.0	83	3.5	0.50	0.49	104.36	10.31	3.89	0.48	0.19	10.75	44.11	0.20	2.09	7.04
France	262	78.26	1	-13.5	78	3.5	0.75	0.58	77.85	10.27	3.01	0.46	0.26	14.35	73.21	0.14	2.53	8.24
Germany	277	68.12	1	-21.5	67	3.5	0.42	0.21	41.26	10.24	2.73	0.45	0.14	15.95	80.51	0.26	2.37	7.45
Greece	119	17.39	1	-28.3	61	2	0.33	0.38	58.77	9.96	1.44	0.39	0.07	5.71	145.18	0.07	2.75	6.08
Hong Kong	225	69.57	1	-19.5	73	5	0.92	0.81	485.55	10.36	3.07	0.43	0.39	11.28	97.67	0.07	2.09	7.30
Ireland	41	69.57	0	-5.1	81	5	0.67	0.49	55.47	10.48	4.02	0.45	0.20	3.90	61.49	0.29	2.94	6.91
Italy	151	86.96	1	-24.8	66	2	0.67	0.46	42.91	10.23	1.83	0.38	0.13	7.70	93.14	0.26	2.54	7.32
Japan	1802	86.23	1	-20.5	71	4.5	0.75	0.47	78.90	10.28	2.60	0.41	0.21	8.01	44.53	0.14	1.74	7.50
Netherlands	158	78.26	1	-16.5	74	2.5	0.50	0.62	100.08	10.34	4.71	0.46	0.27	13.22	64.68	0.18	2.58	7.75
New Zealand	39	68.12	0	N/A	80	4	0.67	0.48	39.72	10.07	3.55	0.44	0.00	6.62	54.33	0.10	2.93	6.68
Norway	49	94.20	1	-5.8	75	3.5	0.58	0.43	50.23	10.57	4.46	0.40	0.12	8.49	46.73	0.37	2.47	6.30
Portugal	28	62.32	0	-25.1	56	2.5	0.42	0.55	37.12	9.89	1.08	0.37	0.14	3.64	114.65	0.14	2.84	6.62
Singapore	188	63.77	1	-21.6	79	5	1.00	0.84	153.68	10.19	2.83	0.45	0.26	8.04	57.26	0.13	1.62	6.75
Spain	129	89.13	1	-18.6	72	5	0.50	0.50	81.46	10.15	2.56	0.42	0.08	11.62	68.98	0.09	3.56	7.34
Sweden	150	86.23	1	-6.8	83	3.5	0.58	0.45	97.30	10.31	4.96	0.41	0.11	8.37	50.92	0.21	2.69	7.44
Switzerland	199	73.91	1	-22.0	80	3	0.67	0.48	227.72	10.43	4.13	0.49	0.16	10.95	72.13	0.16	2.71	7.64
U.K.	1080	86.96	1	-7.0	85	5	0.83	0.73	133.44	10.37	3.72	0.54	0.14	5.68	72.76	0.18	3.08	6.92
U.S.	16382	97.83	1	-2.0	76	3	1.00	0.97	128.17	10.56	3.65	0.55	0.00	3.71	53.41	0.46	0.56	5.45

Table 3.3 Correlation coefficients at the country and firm level

This table presents Pearson correlation coefficients between the country-level and firm-level variables employed in this study. Panel A presents Pearson correlation coefficients between country-level variables. *TIME* from Bushman, Piotroski, and Smith (2004) measures the timeliness of financial disclosure in a country. *INS* is a dummy variable which takes a value of one if the country enforced the insider trading law by the end of 1999. We obtain the information on the year during which the first legal case is brought against insider trading from Bhattacharya and Daouk (2002). *EM* is the aggregate earnings management score from Leuz, Nanda, and Wysocki (2003) multiplied by -1. Disclosure index (*CR*) from Bushman, Piotroski, and Smith (2004) measures the financial disclosure practice in a country. *DIR* denotes revised anti-director index from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2006). Disclosure requirement index (*DIS*) and securities regulation index (*SEC*) from Hail and Leuz (2006) measure the regulations mandating and enforcing disclosure, respectively. *MCAP* is a country's equity market capitalization scaled by current year GDP. *GDP* is the log of a country's annual GDP per capita. Panel B presents Pearson correlation coefficients between firm-level variables. *VAR* is the stock return variance over the event window, scaled by the stock return variance over the estimation window. Stock return variance over the event window equals the average of the squared prediction errors from the local market model during the firm's earnings announcement window (-1, 1) with respect to the earnings announcement date. The stock return variance over the estimation window equals the variance of the residual returns from the firm's market model estimated using an estimation window (-120, -21) relative to the announcement date. *ADR* is a dummy variable, which takes a value of one if the firm listed the shares in the U.S. market, and zero otherwise. *ANA* is the number of analysts that follow the stock of the firm at the time of the announcement. *RLAG* is the number of days from the fiscal year-end to the earnings announcement date reported by I/B/E/S. *LOSS* is a dummy variable which takes a value of one if the net income is less than zero and zero, otherwise. *MB* is a firm's market to book ratio. *SIZE* is the log of a firm's stock market capitalization in the millions of U.S. dollars. All firm-level variables except *GOV44* is winsorized at the 1% in both tails of the distribution. *p* values are reported in parentheses.

Panel A: At the Country Level									
Variables	<i>TIME</i>	<i>INS</i>	<i>EM</i>	<i>CR</i>	<i>DIR</i>	<i>DIS</i>	<i>SEC</i>	<i>MCAP</i>	<i>GDP</i>
<i>TIME</i>	1.000								
<i>INS</i>	0.249 (0.01)	1.000							
<i>EM</i>	0.653 (0.00)	0.188 (0.05)	1.000						
<i>CR</i>	0.468 (0.00)	0.255 (0.01)	0.728 (0.00)	1.000					
<i>DIR</i>	0.297 (0.00)	0.062 (0.51)	0.396 (0.00)	0.575 (0.00)	1.000				
<i>DIS</i>	0.482 (0.00)	0.310 (0.00)	0.512 (0.00)	0.562 (0.00)	0.549 (0.00)	1.000			
<i>SEC</i>	0.397 (0.00)	0.283 (0.00)	0.521 (0.00)	0.413 (0.00)	0.386 (0.00)	0.863 (0.00)	1.000		
<i>MCAP</i>	0.037 (0.70)	0.326 (0.00)	0.038 (0.69)	0.266 (0.00)	0.333 (0.00)	0.479 (0.00)	0.470 (0.00)	1.000	
<i>GDP</i>	0.561 (0.00)	0.242 (0.01)	0.580 (0.00)	0.453 (0.00)	0.151 (0.11)	0.305 (0.00)	0.163 (0.08)	0.238 (0.01)	1.000

Panel B: At the Firm Level

	<i>VAR</i>	<i>GOV44</i>	<i>ADR</i>	<i>ANA</i>	<i>RLAG</i>	<i>LOSS</i>	<i>MB</i>	<i>SIZE</i>
<i>VAR</i>	1.000							
<i>GOV44</i>	0.116 (0.00)	1.000 (0.00)						
<i>ADR</i>	-0.013 (0.09)	-0.070 (0.00)	1.000 (0.00)					
<i>ANA</i>	0.064 (0.00)	0.119 (0.00)	0.281 (0.00)	1.000 (0.00)				
<i>RLAG</i>	-0.064 (0.00)	-0.202 (0.00)	-0.029 (0.00)	-0.255 (0.00)	1.000 (0.00)			
<i>LOSS</i>	-0.076 (0.00)	-0.100 (0.00)	-0.109 (0.00)	-0.335 (0.00)	0.138 (0.00)	1.000 (0.00)		
<i>MB</i>	-0.011 (0.14)	-0.177 (0.00)	0.212 (0.00)	0.195 (0.00)	0.085 (0.00)	-0.125 (0.00)	1.000 (0.00)	
<i>SIZE</i>	0.065 (0.00)	0.215 (0.00)	0.262 (0.00)	0.700 (0.00)	-0.342 (0.00)	-0.420 (0.00)	0.216 (0.00)	1.000

Table 3.4 Financial reporting structural factors and market response around earnings announcements

This table presents the estimated coefficients from ordinary least squares (OLS) regressions of market reactions measure on four financial reporting factors including year fixed effects at the country level. The dependent variable is the country average of VAR in a given year. For each firm-year, VAR is calculated as the stock return variance over the event window, scaled by the stock return variance over the estimation window. Stock return variance over the event window equals the average of the squared prediction errors from the local market model during the firm's earnings announcement window $(-1, 1)$ with respect to the earnings announcement date. The stock return variance over the estimation window equals the variance of the residual returns from the firm's market model estimated using an estimation window $(-120, -21)$ relative to the announcement date. $TIME$ from Bushman, Piotroski, and Smith (2004) measures the timeliness of financial disclosure in a country. INS is a dummy variable which takes a value of one if the country enforced the insider trading law by the end of 1999. We obtain the information on the year during which the first legal case is brought against insider trading from Bhattacharya and Daouk (2002). EM is the aggregate earnings management score from Leuz, Nanda, and Wysocki (2003) multiplied by -1. Disclosure index (CR) from Bushman, Piotroski, and Smith (2004) measures the financial disclosure practice in a country. N is the number of observations. t statistics are shown in parentheses. $\bar{R}^2$ is the adjusted R^2 . The sample period is from 2002 to 2005.

Dependent variable = VAR						
Model	Pred. sign	(1)	(2)	(3)	(4)	(5)
Intercept		2.083 (2.92)	4.791 (3.05)	-3.189 (-2.44)	-2.019 (-0.97)	-1.648 (-0.76)
$TIME$	Negative	0.019 (2.67)	-0.004 (-0.36)	0.001 (0.10)		-0.004 (-0.38)
INS	Positive	0.580 (1.08)	0.770 (1.31)	0.308 (0.64)	0.285 (0.44)	0.307 (0.49)
EM	Positive		0.074 (2.63)		0.017 (0.79)	0.022 (0.85)
CR	?			0.093 (4.04)	0.082 (2.86)	0.081 (2.83)
Year dummies		Yes	Yes	Yes	Yes	Yes
N		92	88	92	88	88
$\bar{R}^2$		0.071	0.130	0.192	0.183	0.173

Table 3.5 Firm corporate governance and market reactions around earnings announcements

This table presents the estimated coefficients from OLS regressions of market reactions measure on corporate governance rating, pre-announcement information variables and a series of firm-level control variables including industry, country and year fixed effects. The dependent variable is VAR , calculated as the stock return variance over the event window, scaled by the stock return variance over the estimation window. Stock return variance over the event window equals the average of the squared prediction errors from the local market model during the firm's earnings announcement window $(-1, 1)$ with respect to the earnings announcement date. The stock return variance over the estimation window equals the variance of the residual returns from the firm's market model estimated using an estimation window $(-120, -21)$ relative to the announcement date. ADR is a dummy variable, which takes a value of one if the firm listed the shares in the U.S. market, and zero otherwise. ANA is the number of analysts that follow the stock of the firm at the time of the announcement. $RLAG$ is the number of days from the fiscal year-end to the earnings announcement date reported by I/B/E/S. $LOSS$ is a dummy variable which takes a value of one if the net income is less than zero and zero, otherwise. MB is a firm's market to book ratio. $SIZE$ is the log of a firm's stock market capitalization in the millions of U.S. dollars. $DISP$ is the standard deviation of analyst forecasts deflated by the mean forecast. $ABSUE$ is the absolute value of the difference between actual earnings per share and mean forecast deflated by the standard deviation of earnings forecasts. All variables except $GOV44$ is winsorized at the 1% in both tails of the distribution. Standard errors are adjusted for clustering at the firm level. t statistics are shown in parentheses. $\bar{R}^2$ is the adjusted R^2 . The number of observations (N) are restricted to those for which all accounting variables are nonzero. The sample period is from 2002 to 2005.

	Full sample		Global sample		U.S. sample	
Model	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	3.629 (8.59)	4.043 (7.00)	3.808 (4.14)	4.133 (4.12)	3.528 (6.80)	4.367 (5.34)
$GOV44$	2.261 (3.84)	2.911 (3.84)	3.819 (3.09)	2.828 (2.25)	1.405 (1.99)	2.051 (2.02)
ADR	-0.042 (-0.22)	-0.005 (-0.02)	0.096 (0.48)	0.076 (0.37)		
ANA	0.036 (3.17)	0.006 (0.45)	0.024 (1.49)	0.020 (1.12)	0.041 (2.49)	-0.016 (-0.74)
$RLAG$	-0.003 (-1.93)	-0.009 (-4.23)	-0.011 (-6.41)	-0.011 (-4.93)	0.001 (0.40)	-0.008 (-1.60)
$LOSS$	-0.776 (-7.08)	-0.789 (-5.35)	-0.522 (-2.90)	-0.650 (-3.15)	-0.841 (-6.18)	-0.810 (-3.88)
MB	0.012 (0.35)	-0.020 (-0.46)	0.017 (0.39)	0.039 (0.79)	0.169 (1.89)	-0.166 (-0.90)
$SIZE$	0.041 (1.03)	0.038 (0.64)	-0.118 (-1.54)	-0.102 (-1.21)	0.125 (2.38)	0.163 (1.75)
$DISP$		0.004 (0.22)		0.123 (1.15)		-0.008 (-2.09)
$ABSUE$		0.024 (2.49)		0.024 (1.72)		0.024 (1.91)
Industry & Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
$\bar{R}^2$	0.037	0.047	0.039	0.04	0.036	0.043
N	17223	10879	5707	4943	11516	5936

Table 3.6 Firm corporate governance and market reactions on profit/loss firms and good news/bad news firms

This table presents the estimated coefficients from OLS regressions of market reactions measure on corporate governance rating, pre-announcement information variables and a series of firm-level control variables including industry, country and year fixed effects. The dependent variable is VAR , calculated as the stock return variance over the event window, scaled by the stock return variance over the estimation window. Stock return variance over the event window equals the average of the squared prediction errors from the local market model during the firm's earnings announcement window (-1, 1) with respect to the earnings announcement date. The stock return variance over the estimation window equals the variance of the residual returns from the firm's market model estimated using an estimation window (-120, -21) relative to the announcement date. ADR is a dummy variable, which takes a value of one if the firm listed the shares in the U.S. market, and zero otherwise. ANA is the number of analysts that follow the stock of the firm at the time of the announcement. $RLAG$ is the number of days from the fiscal year-end to the earnings announcement date reported by I/B/E/S. $LOSS$ is a dummy variable which takes a value of one if the net income is less than zero and zero, otherwise. MB is a firm's market to book ratio. $SIZE$ is the log of a firm's stock market capitalization in the millions of U.S. dollars. Profit (Loss) sample includes firms with positive (negative) net income. Good (Bad) news sample includes firms with actual earnings greater (less) than analysts' mean forecast. $\Delta Coef$ represents the difference between coefficients on $GOV44$ across profit/loss subsamples and good news/bad news subsamples. All variables except $GOV44$ is winsorized at the 1% in both tails of the distribution. Standard errors are adjusted for clustering at the firm level. t statistics are shown in parentheses. $\bar{R}^2$ is the adjusted R^2 . The number of observations (N) are restricted to those for which all accounting variables are nonzero. The sample period is from 2002 to 2005.

	Profit sample	Loss sample	Good news sample	Bad news sample
Model	(1)	(2)	(3)	(4)
Intercept	4.265 (8.01)	2.675 (4.28)	5.758 (7.32)	3.304 (4.17)
$GOV44$	2.662 (3.52)	0.110 (0.11)	2.886 (2.76)	2.979 (2.56)
ADR	-0.011 (-0.06)	-0.819 (-2.39)	-0.072 (-0.30)	-0.160 (-0.58)
ANA	0.037 (2.82)	0.087 (4.26)	0.009 (0.53)	0.041 (2.26)
$RLAG$	-0.002 (-1.42)	0.001 (0.66)	-0.013 (-4.09)	-0.003 (-1.53)
$LOSS$			-0.720 (-3.30)	-0.880 (-4.65)
MB	-0.066 (-1.47)	-0.002 (-0.03)	-0.111 (-1.96)	0.014 (0.21)
$SIZE$	-0.011 (-0.25)	0.110 (1.86)	-0.039 (-0.58)	0.006 (0.09)
Industry & Year dummies	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
$\bar{R}^2$	0.042	0.038	0.056	0.057
N	12,733	4,500	6,374	4,505
$\Delta Coef$		2.552 (2.07)		-0.093 (-0.06)

Table 3.7 Firm corporate governance, legal environment and market reactions around earnings announcements

This table presents the estimated coefficients from country random effects OLS regressions of market reaction measures on corporate governance rating, country legal environment variables and a series of firm-level and country-level control variables including industry and year fixed effects. The dependent variable is *VAR*, calculated as the stock return variance over the event window, scaled by the stock return variance over the estimation window. Stock return variance over the event window equals the average of the squared prediction errors from the local market model during the firm's earnings announcement window (-1, 1) with respect to the earnings announcement date. The stock return variance over the estimation window equals the variance of the residual returns from the firm's market model estimated using an estimation window (-120, -21) relative to the announcement date. *ADR* is a dummy variable, which takes a value of one if the firm listed the shares in the U.S. market, and zero otherwise. *ANA* is the number of analysts that follow the stock of the firm at the time of the announcement. *RLAG* is the number of days from the fiscal year-end to the earnings announcement date reported by I/B/E/S. *LOSS* is a dummy variable which takes a value of one if the net income is less than zero and zero, otherwise. *MB* is a firm's market to book ratio. *SIZE* is the log of a firm's stock market capitalization in the millions of U.S. dollars. The seven legal institutional variables are: (1) *TIME* from Bushman, Piotroski, and Smith (2004) measures the timeliness of financial disclosure in a country; (2) *INS* is a dummy variable which takes a value of one if the country enforced the insider trading law by the end of 1999 (We obtain the information on the year during which the first legal case is brought against insider trading from Bhattacharya and Daouk (2002)); (3) *EM* is the aggregate earnings management score from Leuz, Nanda, and Wysocki (2003) multiplied by -1; (4) Disclosure index (*CR*) from Bushman, Piotroski, and Smith (2004) measures the financial disclosure practice in a country; (5) Revised anti-director index (*DIR*) from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2006) measures overall quality of legal system; (6) Disclosure requirement index (*DIS*) and (7) Securities regulation index (*SEC*) from Hail and Leuz (2006) measure the regulations mandating and enforcing disclosure, respectively. The two country-level control variables are (1) *MCAP* is a country's equity market capitalization scaled by current year GDP; and (2) *GDP* is the log of a country's annual GDP per capita. The number of observations (*N*) are restricted to those for which all accounting variables are nonzero. All firm-level variables except *GOV44* is winsorized at the 1% in both tails of the distribution. Standard errors are adjusted for clustering at the firm level. *t* statistics are shown in parentheses. $\bar{R}^2$ is the adjusted R^2 . The sample period is from 2002 to 2005.

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Intercept	3.217 (8.25)	-51.759 (-5.07)	-52.261 (-5.11)	-47.173 (-4.15)	-48.119 (-4.22)	-53.974 (-5.26)	-54.876 (-5.33)	-50.763 (-4.86)	-50.464 (-4.82)
<i>GOV44</i>	3.366 (7.50)		1.660 (2.91)		1.649 (2.89)		1.826 (3.22)		1.776 (3.13)
<i>ADR</i>	-0.342 (-1.90)	-0.056 (-0.30)	-0.059 (-0.32)	-0.053 (-0.29)	-0.056 (-0.31)	-0.047 (-0.25)	-0.049 (-0.27)	-0.052 (-0.28)	-0.052 (-0.28)
<i>ANA</i>	0.039 (3.61)	0.041 (3.81)	0.040 (3.67)	0.041 (3.74)	0.039 (3.61)	0.038 (3.49)	0.036 (3.29)	0.041 (3.75)	0.039 (3.56)
<i>RLAG</i>	-0.004 (-2.77)	-0.003 (-1.92)	-0.003 (-1.88)	-0.003 (-1.97)	-0.003 (-1.92)	-0.004 (-2.10)	-0.004 (-2.08)	-0.003 (-1.95)	-0.003 (-1.93)
<i>LOSS</i>	-0.749 (-6.86)	-0.769 (-7.02)	-0.775 (-7.08)	-0.770 (-7.02)	-0.776 (-7.08)	-0.771 (-7.03)	-0.778 (-7.10)	-0.771 (-7.03)	-0.778 (-7.10)
<i>MB</i>	-0.016 (-0.45)	0.047 (1.22)	0.046 (1.18)	0.046 (1.18)	0.044 (1.14)	0.032 (0.84)	0.028 (0.74)	0.044 (1.14)	0.039 (1.02)
<i>SIZE</i>	-0.012 (-0.30)	0.078 (2.01)	0.050 (1.24)	0.079 (2.02)	0.050 (1.25)	0.080 (2.04)	0.048 (1.21)	0.078 (1.99)	0.047 (1.16)
<i>TIME</i>		-0.029 (-4.66)	-0.028 (-4.55)	-0.025 (-3.14)	-0.025 (-3.12)	-0.021 (-3.03)	-0.019 (-2.76)	-0.029 (-4.58)	-0.028 (-4.42)
<i>INS</i>		0.023 (0.04)	-0.004 (-0.01)	-0.052 (-0.09)	-0.071 (-0.13)	0.261 (0.44)	0.269 (0.45)	0.069 (0.12)	0.079 (0.14)
<i>EM</i>		0.002 (0.16)	-0.014 (-0.90)	-0.002 (-0.15)	-0.019 (-1.08)	0.012 (0.82)	-0.004 (-0.27)	0.014 (0.56)	0.006 (0.22)
<i>CR</i>		0.063 (3.88)	0.068 (4.16)	0.073 (3.46)	0.077 (3.64)	0.062 (3.78)	0.067 (4.08)	0.059 (3.35)	0.061 (3.47)
<i>DIR</i>				-0.103 (-0.84)	-0.093 (-0.76)				
<i>DIS</i>						-1.552 (-2.22)	-1.798 (-2.57)		
<i>SEC</i>								-0.449 (-0.61)	-0.826 (-1.12)
<i>MCAP</i>		-0.001 (-1.01)	-0.001 (-1.11)	-0.001 (-0.63)	-0.001 (-0.75)	0.000 (0.06)	0.000 (0.11)	-0.001 (-0.47)	0.000 (-0.27)
<i>GDP</i>		5.144 (5.41)	5.067 (5.32)	4.635 (4.16)	4.609 (4.13)	5.405 (5.63)	5.362 (5.58)	5.108 (5.34)	4.995 (5.21)
Industry & Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	No	No	No	No	No	No	No	No	No
$\bar{R}^2$	0.032	0.035	0.036	0.035	0.036	0.035	0.036	0.035	0.036
N	17,223	17,184	17,184	17,184	17,184	17,184	17,184	17,184	17,184

Chapter 4

Does proximity matter in international bond underwriting

Abstract

In this study, we use data of 3,982 international bond issues to study the impact of geographic proximity on the selection of lead underwriter in the international bond market. As predicted by the proximity relevance hypothesis, we find that proximate banks are more likely to lead underwrite risky bonds and non-rated bonds. On average, the total issue cost is lower if the lead underwriter is a proximate bank. We view this as the ability of the proximate banks to take advantage of their better access to information. However, this relation does not hold in the emerging markets. Furthermore, it should be noted that the effect of the proximate underwriter on the issue cost is weak in countries with a good investor protection legal system.

4.1 Introduction

The international bond market is the largest component of the international capital market. From 1999 to 2005, international bond issues accounted for over 90% of the international security issues (see Figure 4.1).¹¹ Despite the size and importance of this market, very little work has been done on the determinants of its competitive structure. In this study, we examine the effect of geographic proximity on the selection of the lead underwriter. Our data shows that total bond issue cost is on average lower when the underwriter is a proximate bank than when it is a non-proximate bank. These results are consistent with the notion that proximate banks have better access to information on the basis of a sample of 3,982 bond new issues across 31 countries from 1999 to 2005.

A growing literature has documented a strong link between geographic proximity preference and information production in the U.S. and around the world. For example, Coval and Moskowitz (1999, 2001) report that investors prefer to buy local stocks and gain higher excess return by exploiting their local knowledge in the U.S. market. Choe, Kho, and Stulz (2005) show that Korean money managers have an informational advantage over foreign money managers as reflected by price movement in favor of their trades. In international bond underwriting, it is therefore interesting to investigate if proximate banks are better able to assess bond issuers than non-proximate banks. If they can, how would geographic proximity affect the cost of bond issuance? In the international context, do country characteristics such as capital market development and the legal environment factor into the relation between bond issue costs and proximate underwriting?

The answers to these questions are of interest to both the international bond issuers and the investment banks. Let us consider the international bond issuers first. A basic tenet of finance theory is that the goal of financial management

¹¹The sample used in Henderson, Jegadeesh, and Weisbach (2004) generates similar patterns for the period 1990-2001.

is to maximize shareholder's wealth and equivalently to lower the cost of capital. Raising capital internationally is essentially an effective financial decision to reduce fund raising costs. Such a move aids in diversifying risk, improving information transparency (due to stricter security regulations) and increasing liquidity. These advantages potentially allow the firms to reduce the cost of capital (see Stulz (1999); Reese and Weisbach (2002); Pagano, Roell and Zechner (2002)).¹² In this paper, we propose that the proximate underwriter is an alternative determinant of bond at-issue cost. If proximate underwriter has access to private information about the issuer and their participation certifies the credit quality of the issuer, rational investors acknowledge the certification effect and are willing to pay higher at-issue prices.

From the perspective of the investment banks, the geographic proximity to the corporate issuers also gives them easier access to private information. For example, these banks might directly talk to the senior management, observe the daily events from local news and frequently pay site visits. As such, the geographic advantage of proximate banks translates into the information advantage. In the first hypothesis, which is the proximity relevance hypothesis, we conjecture that proximate investment banks have better access to information regarding the bond issuers and hence they are more likely to underwrite more risky and non-rated bond issues. The next question to ask is whether the information advantage of proximate banks may reduce the bond issue costs. On the one hand, due to the direct geographic exposures, lower investigative costs and management costs of graphically proximate banks may reduce the bond issue cost. On the other hand, the proximate banks may hold up the geographic benefits by charging even higher rates. Overall, it is an open empirical question of how the information advantage of the proximate banks affects bond

¹²For instance, Stulz (1999) points out that the international shareholder base diversify risk and thereby lower the cost of capital. Reese and Weisbach (2002) document that when firms issue stocks in countries with stricter security regulations, the improved information transparency allows the firms to lower the cost of capital. Pagano, Roell, and Zechner (2002) show that firms raise funds in more liquid foreign markets.

issue costs. We address this question in the second testing hypothesis - proximity advantage hypothesis.

We test our hypotheses on a sample of 3,982 new international bond issues offered by industrial companies from 31 countries for the period 1999-2005. We document a series of interesting findings in this study. First, contrary to the persistent proximity preference in other areas of finance (such as cross-listing, equity investment and analysts following), the preference for geographically proximate banks by the international bond issuers is only observed in the developed countries. This suggests that the selection of proximate banks may be restricted by the distribution capability of these banks and certain country-level factors. It prompts us to look into the impact of geographic proximity in bond underwriting business by incorporating country characteristics.

Second, we investigate the choice of geographically proximate banks using a probit model with proximate variable as the binary dependent variable, and the issue characteristics as independent variables. We find strong support for our first hypothesis - proximity relevance hypothesis. Specifically, during the sample period, the geographically proximate banks are more likely to lead underwrite risky bonds and non-rated bonds. The results imply that proximate banks appear to have better access to the private information about a company in bond underwriting business.

Third, we examine the impact of the geographic proximity on the bond issue cost. We use ordinary least squares regression model with the issue cost as the dependant variable. Three cost measures, gross spread, ex ante yield to maturity, and the total cost (sum of gross spread and ex ante yield to maturity) are tested, respectively. The results are in support of our second hypothesis that geographic proximity between lead underwriter and the issuer has a pro-competitive effect by reducing the bond issue costs. In particular, our results show that domestic investment banks, on average, charge 34.8 basis points lower than non-domestic banks.

It could be argued that our results are driven by the endogeneity problem associated with the selection of proximate banks. Our sample covers the bond issues across the 31 countries. It is likely that the selection of the proximate banks is dependent on the issue characteristics, not vice versa. To substantiate our previous results, we address the endogeneity problem using Heckman's two-step estimation method.¹³ In the first step, we control for both country and issue characteristics that might drive the selection of proximate underwriters. We use the estimated probability of selecting a proximate bank from the first step to re-estimate the relation between the issue cost and proximate underwriting. The issue cost reducing effect of proximate bank underwriting continues to hold after controlling for potential endogeneity problem.

A sample of international bond issues allows us to incorporate country characteristics in the analysis of geographically proximate underwriting impact on bond issue costs. In this study, we particularly consider the effects of a country's capital market development and legal environment on the relation between proximate underwriting and bond issue costs. We first divide the sample into two sub-samples by separating the new issues based on whether the issuers are from the developed or emerging markets. The issue cost reducing effect of proximate banks is significant and strong for new issues in the developed markets. On the contrary, in the emerging markets, the issue cost does not appear to be significantly associated with domestic bank underwriting. This could be explained by placing capacity of domestic investment banks in emerging markets. In emerging markets, there are not too many investment banks with sufficient placing capacity power in international bond primary market. Hence, the domestic banks' advantage arising from geographic proximity is offset by their lack of marketing power in the international bond markets.

Another important country characteristic considered is a country's legal environ-

¹³Francis and Lennox (2008) explain the potential pitfalls of Heckman (1979) procedure due to empirical difficulty in identifying independent variables in the first stage model. We acknowledge this limitation and urge caution in interpreting our results.

ment. The rationale follows that strong legal environment improves one country's information environment (see Bushman, Piotroski, and Smith (2004)).¹⁴ Put differently, good legal protection facilitates the transfer of firm-specific information to outside investors. In this situation, the relative advantage of proximate banks in obtaining firm private information is limited. We explore this issue by incorporating legal environment measures into our regression models. Following prior literature, legal origin and the rule of law index is alternatively used as a proxy for a country's legal regime. We observe that the advantage of proximate banks tend to be weak in countries with investor-friendly legal system. This finding is consistent with the notion that strong legal regulations substitute for the private information collection by proximate banks.

We also conduct several robustness checks. First, we investigate the robustness of our definition of geographic proximity. Overseas branches of international banks might be able to collect firm-specific information as efficiently as their local competitors. Hence, we refine the definition by taking into account the role of foreign branches. If the foreign bank's branch participates in the deal in home market, we count it as proximate bank underwriting as well. Such a change, however, does not affect our results. Other than the consideration of bank branches, it is possible that our definition of geographical proximity might actually reflect currency proximity. In this case, our information explanation for the geographic proximity in this specific market could not hold. To rule out this possibility, we rerun the regression analyses based on the bond new issues out of Eurozone only. However, our conclusions remain unchanged.

Second, we are aware that most well-known international investment banks are headquartered in world financial centers. Their marketing power and good reputation might also lower bond issue costs. Admittedly, this has nothing to do with an

¹⁴Bushman, Piotroski, and Smith (2004) document that corporate transparency increases with a country's legal regime.

information story we propose in this study. Hence, we regress bond issue costs on proximity measures on a sample of issues from outside financial centers.¹⁵ Again, our results are not sensitive to the international banks located in those financial centers.

The remainder of this paper is organized as follows. Section 4.2 briefly introduces the formation procedure of the underwriting syndicate and develops two testable hypotheses. Section 4.3 describes the summary statistics and the geographic proximity preference distribution across 31 countries. Section 4.4 presents the empirical results of the effect of geographic proximity on the bond issue cost and a series of robustness checks. Section 4.5 concludes.

4.2 International bond underwriting and hypotheses development

4.2.1 Underwriting process and the selection of managers

The international bond market is comprised of the Eurobonds, global and foreign bonds. These bonds are issued by corporations, sovereign governments, as well as multinational organizations such as the World Bank and the European Investment Bank. These bonds are underwritten by investment banks and marketed internationally under limited financial restrictions. The investor base is overwhelmingly institutional. In addition, the issue size of these bonds is usually large.

In the international bond underwriting process, a potential borrower makes known his/her intention to the investment banks, whereupon unsolicited proposals will be received from some of these banks. These proposals provide the potential borrower with information on the timing, pricing and market opportunities in the international market. The potential borrower compares and analyzes these pro-

¹⁵World financial centers consist of France, Germany, Japan, the U.K. and the U.S.

posals by taking into consideration the issue cost, the placement competence and capital adequacy of each investment bank. The borrower then selects one or more investment banks to act as the lead manager. The lead manager may in turn invite a small group of other banks (the co-managers) to form the underwriting syndicate. The issuer either sells the bonds to the entire underwriter syndicate or sells the bonds to the lead manager. Thereafter, the lead manager may allocate a small portion of the bond issue to the co-managers. Since most bond issues in our sample have just one syndicate member, in most cases, the lead underwriter assumes most of the underwriting risks.

There are two methods of international bond underwriting: the "bought" deal and the "open priced" deal. In a "bought" deal, the underwriters commit themselves to purchase the bonds at a minimum price from the borrowers. The investment bank that undertakes a "bought" deal must have considerable expertise in the market. Investment banks must not only have sufficient knowledge of the credit quality of the issuers but also have links with investors in order to secure the new issues placement. In the "open priced" deal, the lead underwriter will commit to arrange the issue and form a group of co-managers.¹⁶ The selling group makes best efforts on marketing the new issues. The formal subscription is completed on the offering day.

In this study, our focus is on the issuer's choice of the lead underwriter as opposed to all the managers in the syndicate. There are two reasons for doing so. First, the lead manager works with the issuer on the terms and conditions of the bond offering. This includes information gathering and processing for the purpose of assessing the credit worthiness of the bond and negotiating the underwriting fees. Second, although other managers also share the underwriting risk, the lead underwriter typically assumes the largest proportion of the underwriting risk. Co-managers either only take charge of the bond sales (in the case of a "bought" deal), or are allocated a portion of the new issues.

¹⁶see Levich (2001) and Kollo (2005)

4.2.2 Testable hypotheses

Studies of geographic proximity originate from the equity "home bias" literature. French and Poterba (1991) observe the equity portfolio holdings for British, American and Japanese investors. They find that most corporate equities are held by domestic investors. Consistent with their findings, Coval and Moskowitz (1999, 2001) and Chan, Covrig and Ng (2005) document that mutual fund managers within and outside the U.S. market neglect the fundamental benefits of portfolio diversification by overweighing the domestic equities or the stocks of regional companies.

The home bias puzzle is not unique to equity portfolio holdings. Sarkissian and Schill (2004) study the impact of proximity preference on the choice of the overseas listing venue. Malloy (2005) measures the link between proximity preference and the information advantage of analysts. He finds that analysts located close to the firms can provide more accurate earnings forecasts. In the banking industry, the geographic proximity also plays a dominant role. Mian (2006) shows that due to the distance constraint, only a few foreign banks lend to local firms because they are not capable of renegotiating and recovering the defaults.

There has been a debate over whether the geographic proximity preference is attributable to the information advantage of locals. Some studies, such as Coval and Moskowitz (2001), Chan, Covrig and Ng (2005), Choe, Kho, and Stulz (2005), and Mian (2006), document the supporting evidence for the information-based explanation of the geographic proximity preference. On the other hand, Seasholes (2000) and Froot and Ramadorai (2001) show that foreigners are better informed investors than locals. In addition, Petersen and Rajan (2002) find that because of advances in information technologies, geographic location does not matter in small business lending.

Nevertheless, the empirical findings in bond primary market research are in favor of information-based explanation for geographic proximity preference. Corwin and

Schultz (2005) examine 1,638 U.S. initial public offerings (IPOs) issued between 1997 and 2002. They find that underwriters from the same state as the firm that is going public are more likely to be included in the IPO syndicate. The results from these studies imply that there is an information advantage for investment bankers to underwrite local companies. Furthermore, Butler (2008) examines a sample of municipal bond issues from 1997 to 2001 and finds that investment banks with a local presence are inclined to underwrite risky local bond issues. They interpret it as the informationally captured advantage of these banks.

We add to literature by investigating the geographic proximity effect in the international bond market. The reasons are twofold. First, we are dealing with cross-border underwriting, which typically means higher investigative costs and higher information opaqueness for the underwriters. Not all foreign banks operate in every country. Hence many of them do not have adequate exposure to the marketplace where the companies offered new issues. Second, unlike domestic bond offerings, international bond offerings are not subject to strict regulations and high standards of disclosure. This therefore requires more efforts by the underwriters to gather and process information about the issuers. Proximate banks, however, are located close to the issuers, so the private information collection is easier for them. This leads us to the first testable hypothesis:

H1: *Proximity relevance hypothesis: Geographic proximity between the issuer and the underwriter affects the choice of the lead underwriter. The proximate banks are better informed than the non-proximate banks because they have better access to information.*

If H1 is true, then the next issue is the proximity-related impact on the bond issue cost. Several recent studies have documented different behaviors of financial intermediaries in making use of superior information. Butler (2008) reports that investment banks that are located in the same state (in the U.S.) as the issuers can

take advantage of their superior information. They enjoy the absolute competitive advantage by being able to offer better prices when underwriting municipal bonds. However, in an indirect literature, the opposing conclusion is found (see Rajan (1992); Boot (2000)). It is shown that despite their ability to access to superior information, these commercial banks actually impose higher rates on the borrowers in lending businesses. Taken together, the effect of geographic proximity on the at-issue pricing of bonds is essentially an empirical question in the international context. This leads us to our second testable hypothesis:

H2: Proximity advantage hypothesis: Proximate lead underwriters take advantage of their access to private information and thus reduce the bond issue cost.

4.3 Data and summary statistics

4.3.1 Data description

Our data come from the Securities Data Company (SDC) New Issues database. From 1999 to 2005, there are a total of 24,747 straight non-equity linked international bond new issues. We start our sample from 1999 in order to coincide with the introduction of the Euro currency.¹⁷ We exclude bond issues of financial firms because they operate in a highly regulated industry, and probably have some business interactions with underwriters. This filter reduces the number of observations from 24,747 to 7,935.¹⁸ We also exclude bond issues of multinational organizations and sovereign governments since the private information collection from these issuers is less obvious as opposed to corporate issuers. We also exclude 27 perpetual bond issues and another 60 issues where we do not have the underwriter identity data.

¹⁷Santos and Tsatsaronis (2003) and Melnik and Nissim (2006) find that the introduction of the Euro dramatically reduced the entry barriers for the investment banks which makes it easier for them to take part in Eurobond issuance. The twelve European countries are Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal and Spain.

¹⁸The bond issues from Luxembourg and Bermuda are excluded because the corporations might domicile in the two countries for the sake of taxation.

Our final sample consists of 3,982 issues from 31 countries for the period 1999 to 2005.

We collect the issue size (expressed in US\$ million), ex ante yield to maturity (%), gross spread (%), the years to maturity, the number of syndicate members and the credit rating for every bond issue. The gross spread is defined as the total underwriting fees as a percentage of the gross proceeds. In addition, we use the bond credit rating provided by the two largest credit rating agencies in the U.S. - Standard&Poor's and Moody's. We base our analysis on the credit ratings provided by Standard&Poor's to avoid potential unsolicited biases.¹⁹ Where Standard&Poor's credit rating is unavailable, we substitute it with the credit ratings provided by Moody's.

In our sample of 3,982 observations, the mean ex ante yield to maturity is 6.4% while the mean gross spread is 0.8%. The mean total bond issue cost (ex ante yield plus gross spread) is 7.4%. The majority of our sample is of good credit quality in that there are 3,243 investment-grade bond issues. However, there are 117 bond issues not rated by either Standard&Poor's or Moody's. Most international bond issues in our sample are medium-term bonds and the mean number of years to maturity is 9.5. The issue size of these international bonds is large - the average issue size in our study is US\$ 725 million. The number of syndicate members ranges from one to 30 in our sample and the mean number is 4.2.

4.3.2 Geographic proximity preference

Definition of proximity

Our database provides the domicile country of the issuer and the lead underwriter. Our definition of proximity is based on the geographical distance between the issuer

¹⁹Poon (2003) shows that bond issues with unsolicited ratings suffer from downward bias. Furthermore, Butler and Rodgers (2003) show that Moody's is particularly keen to provide unsolicited ratings to bond issues.

and the lead underwriter. If an issuer and the lead underwriter are headquartered in the same country, we consider it as a domestic deal. On the other hand, if the issuer and the lead underwriter are based in different countries, we consider it as a foreign deal. We also use a second definition of proximity that is based on the regional location of the issuer and the lead underwriter.²⁰ In this broader definition, if an issuer and the lead underwriter are based in the same region, we consider it as a regional deal. Otherwise, it is considered as non-regional deal.

Specifically, we use the two proximity variables, *DOMESTIC* and *REGIONAL* throughout the following regression tests. *DOMESTIC* is a dummy variable which equals one if the lead underwriter is domiciled in the same country as the issuer, and zero otherwise. *REGIONAL* is a dummy variable which equals one if the lead underwriter is domiciled in the same region as the issuer, and zero otherwise. In cases where there is more than one lead underwriter in a specific bond issuance, the dummy variable equals one so long as one of the investment banks is located in the same country (or region in the case of *REGIONAL*) as the issuer.

Geographic proximity frequency distribution

Table 4.1 presents the geographic proximity preference across 31 countries.²¹ The proportion of issuers choosing domestic lead underwriters varies substantially across countries. There are eight countries (for example, Mexico, New Zealand, and Finland) relying exclusively on foreign banks to underwrite their international bonds. On the contrary, in the developed countries such as the U.S., Japan and the U.K., the proportion is much larger at 86.6%, 40.0% and 32.4%, respectively. The mean proportion of issuers using domestic lead underwriters for the entire sample is 20.0%. Generally, the level of geographic proximity preference is higher in developed markets than in emerging markets. A plausible explanation is that some countries fall short of investment banks that are big enough to market these new issues interna-

²⁰Our regional classification is in accordance with the Morgan Stanley Capital International (MSCI) classifications. The three regions are: Asia Pacific, Europe, and America.

²¹The proportion is defined as the number of bond issues lead managed by a bank from the same country as the issuer scaled by the total number of the issues in the issuer's domicile country.

tionally or do not have the adequate capital commitments to lead underwrite these bond issues.

When we expand the definition of proximity to include regional lead underwriters, the mean proportion of issuers using regional lead underwriters dramatically increases to 58.8%. None of the countries have a regional underwriting ratio of zero, which implies that the geographic proximity preference does persuade in the 31 countries. Specifically, more than half of the bond issues in the region of America are underwritten by the investment houses in the same region. The widespread geographic proximity preference in the international bond offering raises two interesting questions. What are the driving forces of such a proximity preference in the international business? What are the country-level factors that affect the variety of the proximity preference across the 31 countries? These two research issues will be addressed in the following empirical tests.

4.4 Empirical results

Based on the descriptive statistics about the geographic proximity preference of issuers choosing the banks nearby, we conjecture that the proximate investment banks are able to readily acquire superior information on corporate issuers. If this is the case, these banks are more likely to underwrite the risky and non-rated bonds since they are information-sensitive. Rational investors realize the information advantage of proximate banks and would like to offer a high at-issue price of these bond new issues. Furthermore, it is noteworthy that the level of the issuers' preference for proximate banks varies at the country level. There must be some country-level characteristics that influence the relation between the bond issue cost and proximate underwriter. In this section, we perform a series of empirical tests to explore the supporting evidence for the above research questions.

4.4.1 Correlation coefficients between proximity measures and key control variables

The correlation coefficients between proximity measures and key control variables in Table 4.2 give us some insights on the following hypothesis tests. We observe that the correlation coefficient between *DOMESTIC* and total bond issue cost is -0.101 and statistically significant. The negative relation between *REGIONAL* and the total bond issue cost is even stronger. This brings us confidence in examining the cost impact of proximate bank underwriting. The correlation between *DOMESTIC* and other control variables are moderate. This removes our concerns on the potential multicollinearity problem we might be faced with in the regression analysis. Considering the correlations among the key control variables, their relationships are consistent with what have been documented. The credit riskiness and maturity of the bond new issues are positively related to the total cost of bond issuance. This is supposed to compensate for the investors' risk exposure. The issue size and syndicate size are negatively associated with the total bond issue cost.

We should be precautious in interpreting the results since the simple correlation might be explained away by other control variables. In the next sections, we will use the rigorous regression analyses to study the relationship between the proximate underwriter and the bond issue cost.

The following binary probit regression models are adopted to test the proximity relevance hypothesis (H1):

$$\begin{aligned} Prob(DOMESTIC) = & \alpha + \beta_1 \text{Risk indicator} + \beta_2 T\text{COST} + \beta_3 M\text{ATURITY} + \\ & \beta_4 E\text{NHANCER} + \beta_5 I\text{SIZE} + \beta_6 R\text{ANKING} + \\ & \beta_7 S\text{YNSIZE} + \beta_8 C\text{RATE} + \varepsilon; \end{aligned} \tag{4.1}$$

$$\begin{aligned}
Prob(REGIONAL) = & \alpha + \beta_1 \text{Risk indicator} + \beta_2 T\text{COST} + \beta_3 M\text{ATURITY} + \\
& \beta_4 E\text{NHANCER} + \beta_5 I\text{SIZE} + \beta_6 R\text{ANKING} + \\
& \beta_7 S\text{YNSIZE} + \beta_8 C\text{RATE} + \varepsilon.
\end{aligned}
\tag{4.2}$$

The measure for the proximate banks is, alternatively, *DOMESTIC* and *REGIONAL*. *DOMESTIC* (*REGIONAL*) is a dummy variable which equals one if the lead underwriter and the issuer are located in the same country (region), and zero otherwise. If the proximity relevance hypothesis holds, we expect that proximate banks are more likely to underwrite risky and informationally opaque bonds in the probit regression analysis. We follow prior studies and use two risk indicators: (1) the Standard and Poor's bond credit rating (*RATING*) and (2) a non-rated dummy (*NONRATE*). The bond credit rating captures the credit riskiness and the information opaqueness of the issue. For example, Sengupta (1998) and Yu (2005) show that companies with lower accounting disclosure scores (which implies poor information transparency) have lower credit ratings. Non-rated bonds are informationally opaque as well. The potential underwriter needs to assess the issuers on their own before underwriting the deal since no public rating is available.

We also include seven other issue and firm characteristics controls that might determine the selection of the proximate underwriters. They are (1) the total bond issue cost (*TCOST*); (2) the years to maturity (*MATURITY*); (3) a dummy variable that takes one if the issue has a letter of credit (*ENHANCER*), and zero otherwise; (4) the issue size in natural log (*ISIZE*); (5) the ranking of the lead underwriter (*RANKING*) as measured by the prior year market share of the lead underwriter in the primary international bond market; (6) the syndicate size which is equal to the total number of lead underwriters and co-managers in the syndicate group; and (7) the credit rating of the company (*CRATE*), a higher value of which means higher credit risk. In order to control for variations across countries and time,

we also add country fixed effects and year fixed effects in the model.

The results of the probit regression analysis are presented in Table 4.3. Both of the two risk indicators are statistically significant and have the expected signs, regardless of the measurement of proximity. In Model (1), we find that domestic banks are more likely to underwrite risky bonds in a sample of rated bonds. In Model (2), the domestic banks are more likely to underwrite the non-rated bonds. When the two risk indicators are regressed in one probit model (see Model (3)), the previous results remain unchanged. We repeat the tests by replacing *DOMESTIC* with *REGIONAL* in the last three columns of Table 4.3. The coefficient of *RATING* is not statistically significant, although that of *NONRATE* is. The relatively weak result using *REGIONAL* indicates the reduction of the effect of the geographic proximity on information exchange as we extend the distance between the issuer and underwriter from *DOMESTIC* to *REGIONAL*.

The selection of a domestic lead underwriter is also determined by other issue characteristics including the total bond issue cost, the issue size, the ranking of the lead underwriter and the syndicate size. The likelihood of selecting a domestic lead underwriter is negatively related to the issue cost and positively related to the issue size and the syndicate size. Interestingly, the selection of proximate banks is not positively associated with the reputation of the lead underwriter on the basis of its prior-year market share in the international bond primary market. Moreover, company credit rating appears insignificant in explaining the lead underwriter selection.

In summary, the results are consistent with the proximity relevance hypothesis that proximate banks are more likely to underwrite risky and informationally opaque bonds. The evidence is more pronounced when the lead underwriter and the issuer are located in the same country than when they are in the same region.

4.4.2 Proximity advantage tests

Thus far, it is unknown that how the proximate banks utilize the superior information about the issuers in terms of bond issue costs. Do they exploit the information by increasing the issue cost? Or, do they improve their competitiveness by reducing the issue cost? Our next analysis is on the impact of the geographic proximity on the bond issue cost. We use an ordinary least squares regression model to test the hypothesis that proximate lead underwriters can take advantage of their access to information, thereby reducing the rates on new issues. The baseline model is specified below:

$$\begin{aligned} \text{Cost measure} = & \alpha + \beta_1 \text{DOMESTIC} + \beta_2 \text{RATING} + \beta_3 \text{NONRATE} + \\ & \beta_4 \text{MATURITY} + \beta_5 \text{ENHANCER} + \beta_6 \text{ISIZE} + \\ & \beta_7 \text{RANKING} + \beta_8 \text{SYNSIZE} + \beta_9 \text{CRATE} + \varepsilon; \end{aligned} \quad (4.3)$$

$$\begin{aligned} \text{Cost measure} = & \alpha + \beta_1 \text{REGIONAL} + \beta_2 \text{RATING} + \beta_3 \text{NONRATE} + \\ & \beta_4 \text{MATURITY} + \beta_5 \text{ENHANCER} + \beta_6 \text{ISIZE} + \\ & \beta_7 \text{RANKING} + \beta_8 \text{SYNSIZE} + \beta_9 \text{CRATE} + \varepsilon. \end{aligned} \quad (4.4)$$

Cost measure alternatively represents gross spread (the total underwriting fees scaled by the issue proceeds), ex ante yield to maturity and total cost (the sum of gross spread and ex-ante yield to maturity). We use two proximity dummies, namely, *DOMESTIC* and *REGIONAL* to capture the proximity effect of the proximate underwriter. Hence, in equations (4.3) and (4.4), β_1 captures the magnitude of the geographic proximity effect on the bond issue cost. In each regression analysis, we also control for the deal and firm characteristics as specified in equation (4.1) and

(4.2). Country fixed effects and year fixed effects are also included in the model. The results are summarized in Table 4.4.

In Panel A of Table 4.4, we analyze the effect of domestic lead underwriter on three types of bond issue costs. The proportion of the explained variations in the three regression models ranges from 23.9% to 48.9% which indicates the goodness of fit of our model specification. As one might expect, the coefficients for the issue characteristics variables (*MATURITY*, *RATING*, *ENHANCER*, and *NONRATE*) are positively related to the cost, regardless of the cost. Moreover, due to the economy of scales, *ISIZE* is negatively related to underwriting costs (*SPREAD*). In agreement with the certification reasoning, the reputation of the lead underwriter certifies the credit quality of the issuer and significantly reduces the issue costs.

After controlling for the issue characteristics, the coefficient of *DOMESTIC* is economically and statistically significant, no matter which type of bond issue costs is considered. Take the multivariate regression analysis with the dependent variable of total cost for example. A new issue lead underwritten by a domestic bank, on average, costs 34.8 basis points (t statistic is -3.05) less than those underwritten by foreign banks. The results are in support of the proximity advantage hypothesis.

In Panel B of Table 4.4, the regression models are reexamined after replacing the test variable *DOMESTIC* with *REGIONAL*. The coefficients of control variables have the same signs as in the previous regression analyses. The coefficient of *REGIONAL* is still significant although the magnitude is slightly changed. The regional underwriter, on average, reduces the total cost of bond by 51.9 basis points (t statistic is -4.13) compared to the non-regional underwriter. By looking at the results in the last two columns, we can observe that the economically stronger effect of regional underwriter is mainly due to the reduction of underwriting cost. In terms of the ex ante yield to maturity, the new issues underwritten by domestic banks bear

lower cost than those underwritten by regional banks.

One primary concern about the results shown in Tables 4.3 and 4.4 arises because the selection of the proximate banks might be endogenous to the bond issue cost. In other words, the proximate banks are more likely to underwrite the bond issues of certain characteristics and in certain countries. To avoid the endogeneity problem, we follow Puri (1996) by adopting Heckman's two-step method (see Heckman (1979)) to re-estimate the relation between proximate underwriter and the bond issue cost. The results are listed in Table 4.5. In the first step, we include four country characteristics that are commonly used in the international studies as instruments. Specifically, we use GDP per capita and GDP growth to capture the economic development in a country while market capitalization scaled by current year GDP to measure the capital market development. Julio, Kim and Weisbach (2007) document that economy-wide factors, in particular the state of macroeconomy affect the features of debt issues internationally. In the context of international bond underwriting, it could be that underwriters in developed areas are more experienced and well established which lead to a lower cost of bond issues. In addition, legal environment may also cause the endogenous choice of proximate banks. It could be possible that domestic banks are more advantageous to offer competitive rates in countries with poor legal environment in a sense that foreign investment tends to be less in those countries. Hence, I use legal origin dummy to control for legal characteristics of the country. However, I acknowledge the arbitrary selection of instrumental variables and urge caution in interpreting the results. They are the natural log of GDP per capita, GDP growth rate, market capitalization scaled by current year annual GDP and the common law dummy. We also include all dependent variables as in the previous probit model specification.

We replace the *DOMESTIC/REGIONAL* dummy in the second step by the estimated probability, *DINFO/RINFO*, from the first step. Table 4.5 displays that our results still hold after controlling for endogeneity problem. The coefficient

of *DINFO* (-0.142) and *RINFO* (-0.336) is significantly negative at the 1% level, respectively.

To sum up, consistent with the proximity advantage hypothesis, the proximate banks benefit from the geographic proximity and reduce all kinds of bond issue costs. The results are robust after controlling for self-selection bias.

4.4.3 The impact of country characteristics on the relation between proximate underwriter and bond issue cost

A large stream of literature has documented the impact of country characteristics on the cost of capital in the international capital market. In this section, we are interested in looking at how these institutional factors influence the information advantage of proximate banks from the perspective of bond at-issue cost. The country characteristics we study include the capital market development and legal environment.

We first explore the capital market development impact in Table 4.6. The entire sample is divided into two subsamples. One subsample consists of the bond issues from the developed markets (2,479 observations) and the other subsample consists of the bond issues from the emerging markets (210 observations). It should be noted that the domestic underwriter only reduces the bond issue cost in the developed markets (see Models (1) and (2) in Panel A), although the regional underwriter reduces the cost in both of the developed markets and emerging markets (see Models (3) and (4)). In the emerging markets, the issues underwritten by domestic banks cost even higher (1.016; t statistic is 1.81). One plausible reason is that the foreign banks might have better access to the private information. For instance, the foreign banks could offer competitive salary to hire local experts and they are more familiar with the gathering and processing of the private information than the domestic counterparties.

In addition to the capital market development impact, it has been well documented that a country's legal environment plays a significant role in influencing the information environment of one company. Therefore, we also conduct the country random effects regression analyses based on the baseline model specification. These tests give us some insights on how the legal environment of the country affects the negative relation between proximate underwriter and bond issue cost.

It is critical to select an appropriate measure for a country's legal environment. We follow common practice and proxy for legal environment using legal origin measure and the rule of law index, which are available in La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998). To control for the country variations, we not only include the commonly used country factors, such as log of GDP per capita and GDP growth rate, but also the capital market development as measured by the market capitalization scaled by current year annual GDP. That is because the results in Table 4.6 reveal that the relation between bond issue cost and proximate underwriter varies depending upon the capital market development.

Table 4.7 summarizes the legal environment impact on the relation between proximate underwriting and bond issue cost. Let us consider Panel A first. The coefficient of *DOMESTIC* is significantly negative throughout the model specifications based on the country random effects regression analyses. It indicates that the negative relation between the total issue cost and proximate underwriter is robust even after controlling for the various country characteristics. The total bond issue cost is relatively high in common law countries but low in countries with high rule of law index (see Models (2) and (4) of Panel A). Our key interests lie on the coefficient of the interaction term between the legal environment measure and proximity measure. We observe that the relation between the bond issue cost and domestic bank underwriting is weaker in countries with good investor protection.

In Panel B of Table 4.7, we repeat our analysis by replacing *DOMESTIC* with

REGIONAL. The result is qualitatively unchanged. The weakening proximity effects in countries with better investor protection might arise from high quality of corporate public disclosure associated with strong legal regulations. That is, strong public disclosure weakens the information advantage of the proximate banks. Alternatively, the investor-friendly legal environment can encourage the foreign financial institutions to compete businesses with local banks in one country. As a result, the competitive private information acquiring power of these foreign peers could also offset the information advantage that are readily available to proximate banks. Regardless of the underlying reasons, the significant and negative relation between bond issue cost and proximate underwriting holds in all of these regression tests.

4.4.4 Robustness checks

To substantiate our previous conclusions, we conduct several robustness checks in this section. First, it is reasonable to argue that the foreign bank branches might have the equivalent operations as the domestic counterparties (see Butler (2008)). Thus far, our definition of proximate banks only takes into consideration the headquarter of parent banks and bank subsidiaries in the previous tests. To verify that our results are not affected by inclusion of foreign bank branches, we re-estimate the effect of proximate underwriter on the bond issue cost by defining the proximate banks as the parent underwriting banks or underwriting bank branches that are located in the same country/region as the issuer.

SDC database does not directly provide us with the location of foreign bank branches. We use the following algorithm to identify the location of the underwriting bank branches. We first download the full name of lead underwriters. If the full name indicates the location of the specific bank branch, we will manually change the location of parent bank to that of bank branch in our database. Using the newly defined *DOMESTIC/REGIONAL* measures, we re-estimate equation (4.3) and

(4.4) (see Models (1) and (2) of Table 4.8). Our results are robust to incorporating the bank branches in the definition of proximity measures.

Another concern is that the cost reduction by the proximate banks is due to some cause irrelevant to their information advantage. Most likely, the cost reduction effect of proximate underwriting results from better marketing power of proximate banks. To rule out this possibility, we estimate the baseline model using two subsamples. The first subsample only consists of the issues from the countries outside the Eurozone. The banks in the Eurozone adopt the euro dollars as the legacy currency which facilitates their distribution of bond offerings internationally. We note that the results remain unchanged on the subsample of bond issues from countries outside the Eurozone (see Models (3) and (4) of Table 4.8).

Finally, we repeat the analysis using a subsample of issues from the non-financial centers. The financial centers are France, Germany, Japan, the U.K. and the U.S. The banks in these financial centers are expected to be more experienced in the international capital market, thereby possessing higher marketing power in the international bond underwriting business. By excluding the underwriting deals in these countries, we still observe the significant negative coefficient of *DOMESTIC/REGIONAL* in Models (5) and (6) of Table 4.8. It indicates the robustness of the information-based interpretation of the proximate bank underwriting.

4.5 Summary and conclusions

This study contributes to the existing geographic proximity literature by examining a sample of international bond offerings data from 1999 to 2005. We test two hypotheses: the proximity relevance hypothesis, and the proximity advantage hypothesis. Several interesting findings are documented.

Firstly, as the proximity relevance hypothesis suggests, the proximate banks

are more likely to underwrite risky and non-rated bonds. Our interpretation is that geographic proximity facilitates the access to private information by the issuer. Secondly, as predicted by the proximity advantage hypothesis, proximate banks take advantage of the information advantage and certify the credit quality of the issuing companies. The market expects the certification effect by proximate banks, which gives rise to lower rates underwritten by proximate banks. This effect is persistent even after controlling for the endogeneity problem.

Thirdly, we add an international dimension to the relationship between cost of bond issuance and proximate underwriters. Our results show that several country characteristics are relevant to the bond issue cost reduction effect of proximate bank underwriting. For the new issues from the developed markets, the proximate underwriter significantly reduces the bond issue cost. On the contrary, such a relation disappears in the emerging markets.

Moreover, we study how legal environment may influence the effect of proximate bank underwriting on costs of bond issuance. It is interesting to note that the cost reduction effect of proximate underwriters dampens in countries with better investor protection. It is possible that in these countries, the firms are subject to high disclosure requirements or there are many foreign investment houses competing for the international bond underwriting business. Either case could attribute to the weakening information-based advantage of the geographically proximate banks.

To rule out the possibility that the cost reduction by the proximate banks results from causes irrelevant to the private information collection, we run a series of robustness checks. We identify the location of underwriting bank branches and refine the proximity measures, *DOMESTIC* and *REGIONAL*, by counting in the proximate bank branches as well. However, our results are unaffected. We also test our information-based interpretation. Put another way, the selection of proximate banks might be due to the fact that they have good marketing capacity. We run

the same tests using the subsamples outside the Eurozone and outside the financial centers, respectively. Our previous findings remain unchanged.

The implication of this study is twofold. First, in an attempt to expand their global market share, investment banks are recommended to have local presence in the domicile country of the issuer. Our findings could partially explain the rising international mergers and acquisitions in the investment banking industry in recent years. Second, this article contributes to the literature on the ex-ante pricing of new bond issues. In general, proximate banks have a pro-competitive effect on reducing the cost of bonds. Third, country characteristics play an important role in the ex-ante pricing of bond issues. Future research may consider the country-level factors when examining the determinants of bond issue costs.

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Figure 4.1 International debt versus equity new issues

Source: SDC New Issues Database

Table 4.1 Descriptive statistics and geographic distribution of proximate bank selection

Our sample consists of 3,982 international corporate bond offerings from 1999 to 2005. N denotes the number of new bond issues in the country. *DOMESTIC* is calculated as the number of new bond issues lead underwritten by a domestic bank scaled by the total number of new bond issues in that country over the sample period. *REGIONAL* is calculated as the number of new bond issues lead underwritten by a bank from the same region as the issuer scaled by the total number of new bond issues over the sample period. In this table, both *DOMESTIC* and *REGIONAL* are expressed in percentage. *TCOST* (in percentage) is the total bond issue cost which is the sum of the ex ante yield to maturity and the percent underwriting fees. *YIELD* (in percentage) is the ex ante yield to maturity. *SPREAD* (in percentage) is the total underwriting fees scaled by the issue proceeds.

	N	<i>DOMESTIC</i>	<i>REGIONAL</i>	<i>YIELD</i>	<i>SPREAD</i>	<i>TCOST</i>
America						
Argentina	22	0.0	86.4	9.9	0.8	10.8
Brazil	68	2.9	66.2	9.6	0.7	10.5
Canada	198	8.1	82.8	7.1	1.0	8.6
Chile	13	0.0	84.6	6.8	0.5	6.9
Mexico	83	0.0	92.8	8.4	1.4	9.8
U.S.	896	86.6	88.6	6.6	0.7	6.9
Asia Pacific						
Australia	35	5.7	11.4	5.5	0.8	6.3
Hong Kong	47	48.9	53.2	6.8	1.0	8.6
Japan	90	40.0	45.6	3.5	0.5	4.5
Malaysia	17	11.8	35.3	6.7	0.6	7.4
New Zealand	10	0.0	10.0	6.0	0.5	6.0
Philippines	14	0.0	21.4	8.6	1.3	10.5
Singapore	23	4.3	8.7	6.8	0.6	7.6
South Korea	52	7.7	34.6	4.5	0.5	4.8
Europe						
Austria	30	26.7	76.7	5.0	1.1	6.1
Belgium	30	53.3	83.3	5.4	1.2	6.4
Denmark	22	4.5	77.3	5.0	0.7	5.7
Finland	23	0.0	52.2	5.4	0.4	6.2
France	515	47.0	71.8	4.8	0.7	5.8
Germany	431	51.7	68.7	5.6	0.7	6.6
Greece	27	11.1	59.3	5.4	0.5	5.7
Italy	163	63.2	81.6	5.9	0.7	6.6
Netherlands	128	23.4	55.5	7.7	1.3	9.3
Norway	55	0.0	56.4	5.9	1.2	7.4
Poland	10	0.0	50.0	9.3	1.7	11.8
Portugal	15	6.7	46.7	4.8	0.3	5.1
Russia	47	2.1	63.8	8.8	0.9	10.0
Spain	94	43.6	75.5	6.6	0.7	7.3
Sweden	69	7.2	53.6	6.1	1.0	7.8
Switzerland	95	31.6	65.3	4.8	1.3	5.9
U.K.	660	32.4	63.0	5.8	0.7	6.5
<i>Total</i>	3,982	20	58.8	6.4	0.8	7.4

Table 4.2 Correlations between the proximity measure and key control variables

This table reports the Pearson's correlation coefficients between the proximity measure and key control variables. *DOMESTIC* is a dummy variable which takes one when the lead underwriter is headquartered in the same country as the issuer and zero otherwise. *REGIONAL* is also a dummy variable which takes one when the lead underwriter is headquartered in the same region as the issuer and zero otherwise. In case that there is more than one lead underwriter, *DOMESTIC*/*REGIONAL* takes a value of one as long as there is one lead underwriter headquartered in the same country/region as the issuer. The total bond issue cost (*TCOST*) is the sum of the ex ante yield to maturity and the percent underwriting fees. *RATING* measures the bond credit rating - AAA-rated bonds = 1, AA+ or Aa1-rated bonds = 2, etc. *RATING* = 0 if the bond is not rated. *NONRATE* is a dummy variable that is equal to one if the bond is not rated by either Standard&Poor's or Moody's, and zero otherwise. *MATURITY* is the time period (in years) between the issue date and final maturity date. *ISIZE* is the natural log of the gross proceeds in millions of US dollars. *p* statistics are shown in the parentheses.

	<i>DOMESTIC</i>	<i>REGIONAL</i>	<i>TCOST</i>	<i>RATING</i>	<i>NONRATE</i>	<i>MATURITY</i>
<i>DOMESTIC</i>	1.000					
<i>TCOST</i>	-0.101 (0.00)	-0.109 (0.00)	1.000			
<i>RATING</i>	-0.001 (0.96)	0.014 (0.37)	0.496 (0.00)	1.000		
<i>NONRATE</i>	-0.006 (0.72)	-0.033 (0.04)	-0.049 (0.01)	-0.579 (0.00)	1.000	
<i>MATURITY</i>	0.047 (0.00)	0.091 (0.00)	0.123 (0.00)	0.033 (0.04)	-0.087 (0.00)	1.000
<i>ISIZE</i>	0.269 (0.00)	0.185 (0.00)	0.020 (0.30)	0.165 (0.00)	-0.255 (0.00)	0.182 (0.00)

Table 4.3 Determinants of the selection of proximate underwriter

This table reports the results using the binary probit regression model. The dependent variable is *DOMESTIC* and we also repeat the regression using *REGIONAL* as the dependent. *DOMESTIC* is a dummy variable that takes a value of one if a domestic bank lead underwrites the deal, and zero otherwise. *REGIONAL* is a dummy variable that takes a value of one if a bank from the same region as the issuer lead underwrites the deal, and zero otherwise. *TCOST* (in percentage) denotes the total bond issue cost, which is the sum of yield to maturity (*YIELD*) and gross spread (*SPREAD*). *RATING* measures the bond credit rating. *NONRATE* is a dummy variable that is equal to one if the bond is not rated by either Standard&Poor's or Moody's, and zero otherwise. *MATURITY* is the time period (in years) between the issue date and final maturity date. *ENHANCER* is a dummy variable that takes one if the issue has a credit letter, and zero otherwise. *ISIZE* is the natural log of the gross proceeds in millions of US dollars. *RANKING* measures the lead underwriter's reputation in the primary international bond market on the basis of the prior year market shares. It is a numeric ranging from 1 (lowest rank) to 15 (highest rank). *RANKING* = 0 if the investment bank is not in the top 15 list. If there is more than one lead underwriter in the bond issuance, *RANKING* is set equal to the highest ranking among the lead underwriters. *SYNSIZE* is equal to the total number of lead underwriter(s) and co-manager(s). *CRATE* denotes the issuing company's credit rating - AAA-rated companies = 1, AA+ or Aa1-rated companies = 2, etc. Country dummies and year dummies are included. The number of observations varies in different model specifications depending upon the data availability. Standard errors are adjusted for heteroskedasticity (see White (1980)). *t* statistics are shown in parentheses. $\bar{R}^2$ is the adjusted R^2 . Sample period is from year 1999 to year 2005.

Dependent variable =	Prob(<i>DOMESTIC</i>)			Prob(<i>REGIONAL</i>)		
Model	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-6.709 (-0.03)	-6.451 (-0.03)	-6.563 (-0.03)	-1.616 (-2.64)	-1.501 (-2.47)	-1.512 (-2.48)
<i>RATING</i>	0.073 (2.20)		0.079 (2.48)	-0.002 (-0.07)		0.006 (0.21)
<i>NONRATE</i>		0.536 (4.57)	0.755 (5.11)		0.335 (2.72)	0.353 (2.32)
<i>TCOST</i>	-0.028 (-2.13)	-0.012 (-1.12)	-0.028 (-2.24)	-0.054 (-4.33)	-0.052 (-5.35)	-0.053 (-4.54)
<i>MATURITY</i>	0.010 (2.94)	0.006 (1.87)	0.008 (2.28)	0.016 (3.90)	0.014 (3.67)	0.014 (3.65)
<i>ENHANCER</i>	0.225 (1.21)	0.165 (0.93)	0.227 (1.27)	0.175 (0.91)	0.174 (0.96)	0.178 (0.97)
<i>ISIZE</i>	0.254 (8.28)	0.236 (8.12)	0.240 (8.23)	0.125 (4.15)	0.118 (4.13)	0.119 (4.12)
<i>RANKING</i>	-0.015 (-2.06)	-0.019 (-2.89)	-0.022 (-3.26)	-0.008 (-1.16)	-0.018 (-2.76)	-0.018 (-2.76)
<i>SYNSIZE</i>	0.031 (3.85)	0.034 (4.48)	0.036 (4.68)	0.053 (6.01)	0.054 (6.35)	0.054 (6.36)
<i>CRATE</i>	0.015 (0.70)	0.029 (1.38)	0.021 (1.01)	-0.018 (-0.88)	-0.011 (-0.57)	-0.012 (-0.60)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	2,486	2,689	2,689	2,486	2,689	2,689
$\bar{R}^2$	0.375	0.36	0.362	0.188	0.175	0.175

Table 4.4 Effects of proximate underwriter on the bond issue cost

This table reports the results using the ordinary least squares regression model. The dependent variable is, alternatively, the ex ante yield to maturity (*YIELD*), the gross spread (*SPREAD*), and the total cost (*TCOST* is equal to the sum of *YIELD* and *SPREAD*). Panel A shows domestic underwriting effect on bond issue costs and Panel B shows regional underwriting effect. *RATING* measures the bond credit rating. *NONRATE* is a dummy variable that is equal to one if the bond is not rated by either Standard&Poor's or Moody's, and zero otherwise. *MATURITY* is the time period (in years) between the issue date and final maturity date. *ENHANCER* is a dummy variable that takes one if the issue has a credit letter, and zero otherwise. *ISIZE* is the natural log of the gross proceeds in millions of US dollars. *RANKING* measures the lead underwriter's reputation in the primary international bond market on the basis of the prior year market shares. It is a numeric ranging from 1 (lowest rank) to 15 (highest rank). *RANKING* = 0 if the investment bank is not in the top 15 list. If there is more than one lead underwriter in the bond issuance, *RANKING* is set equal to the highest ranking among the lead underwriters. *SYNSIZE* is equal to the total number of lead underwriter(s) and co-manager(s). *CRATE* denotes the issuing company's credit rating. Country dummies and year dummies are also included in the regression. The number of observations varies in different model specifications depending upon the data availability. *t* statistics in parentheses are adjusted for heteroskedasticity (see White (1980)). $\bar{R}^2$ is the adjusted R^2 . Sample period is from year 1999 to year 2005.

Dependent variable =	Panel A: <i>DOMESTIC</i>			Panel B: <i>REGIONAL</i>		
	<i>TCOST</i>	<i>YIELD</i>	<i>SPREAD</i>	<i>TCOST</i>	<i>YIELD</i>	<i>SPREAD</i>
Intercept	-0.052 (-0.10)	-1.342 (-3.99)	0.531 (4.01)	0.283 (0.54)	-1.221 (-3.67)	0.624 (4.66)
<i>DOMESTIC</i>	-0.348 (-3.05)	-0.229 (-2.76)	-0.160 (-4.82)			
<i>REGIONAL</i>				-0.519 (-4.13)	-0.192 (-2.20)	-0.124 (-3.60)
<i>RATING</i>	1.468 (24.29)	1.295 (41.53)	0.244 (14.96)	1.459 (24.31)	1.293 (41.44)	0.241 (14.76)
<i>NONRATE</i>	4.018 (13.93)	3.857 (20.99)	0.673 (8.64)	3.973 (13.85)	3.822 (21.01)	0.647 (8.27)
<i>MATURITY</i>	0.056 (9.32)	0.045 (9.73)	0.010 (5.90)	0.056 (9.67)	0.045 (9.84)	0.010 (6.05)
<i>ENHANCER</i>	0.808 (2.99)	0.860 (5.31)	0.172 (1.62)	0.806 (2.98)	0.864 (5.32)	0.166 (1.56)
<i>ISIZE</i>	0.146 (2.64)	0.286 (7.67)	-0.090 (-5.88)	0.143 (2.66)	0.280 (7.62)	-0.095 (-6.50)
<i>RANKING</i>	-0.035 (-3.08)	-0.025 (-2.96)	-0.009 (-2.80)	-0.036 (-3.11)	-0.024 (-2.86)	-0.008 (-2.67)
<i>SYNSIZE</i>	-0.024 (-2.43)	-0.021 (-2.74)	0.004 (1.11)	-0.021 (-2.15)	-0.021 (-2.70)	0.004 (1.07)
<i>CRATE</i>	-0.069 (-2.26)	-0.047 (-2.48)	-0.021 (-2.23)	-0.074 (-2.41)	-0.049 (-2.56)	-0.022 (-2.38)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	2,689	3,982	2,689	2,689	3,982	2,689
$\bar{R}^2$	0.434	0.489	0.242	0.436	0.489	0.239

Table 4.5 Effects of proximate underwriter on the total bond issue cost after controlling for endogeneity

This table reports the results of the effects of the proximate underwriter on the total bond issue cost after controlling for endogeneity using Heckman's two-step method (see Heckman (1979)). The first step in Models (1) and (3) tests the choice of domestic lead underwriter using as instruments the natural log of GDP per capita (*LGDP*), GDP growth rate (*GDPGROWTH*), market capitalization scaled by current year GDP (*MCAP_GDP*), and a dummy variable denoting the country that adopts common law system (*COMCIV*). The dependent variable in the second step (Models (2) and (4)) is *TCOST*. *DINFO* is the conditional likelihood of selecting a domestic underwriter estimated in the first step. Similarly, *RINFO* is the conditional likelihood of selecting a regional underwriter estimated in the first step. *RATING* measures the bond credit rating. *NONRATE* is a dummy variable that is equal to one if the bond is not rated by either Standard&Poor's or Moody's, and zero otherwise. *MATURITY* is the time period (in years) between the issue date and final maturity date. *ENHANCER* is a dummy variable that takes one if the issue has a credit letter, and zero otherwise. *ISIZE* is the natural log of the gross proceeds in millions of US dollars. *RANKING* measures the lead underwriter's reputation in the primary international bond market on the basis of the prior year market shares. It is a numeric ranging from 1 (lowest rank) to 15 (highest rank). *RANKING* = 0 if the investment bank is not in the top 15 list. If there is more than one lead underwriter in the bond issuance, *RANKING* is set equal to the highest ranking among the lead underwriters. *SYNSIZE* is equal to the total number of lead underwriter(s) and co-manager(s). *CRATE* denotes the issuing company's credit rating. *t* statistics (in parentheses) are adjusted for heteroskedasticity (see White (1980)). $\bar{R}^2$ is the adjusted R^2 . Sample period is from year 1999 to year 2005.

Model	(1)	(2)	(3)	(4)
Dependent variable =	Prob(<i>DOMESTIC</i>)	<i>TCOST</i>	Prob(<i>REGIONAL</i>)	<i>TCOST</i>
Intercept	-15.472 (-12.98)	-0.140 (-0.24)	-1.571 (-2.77)	-0.416 (-0.77)
<i>LGDP</i>	2.533 (11.96)		0.287 (2.99)	
<i>GDPGROWTH</i>	-0.044 (-1.65)		-0.055 (-2.57)	
<i>MCAP_GDP</i>	-0.002 (-3.04)		-0.002 (-3.61)	
<i>COMCIV</i>	0.152 (1.96)		0.352 (4.73)	
<i>DINFO</i>		-0.142 (-2.14)		
<i>RINFO</i>				-0.336 (-4.64)
<i>RATING</i>	0.006 (0.24)	1.423 (22.71)	-0.033 (-1.39)	1.416 (22.76)
<i>NONRATE</i>	0.675 (5.37)	3.880 (13.70)	0.241 (1.82)	3.871 (13.70)
<i>MATURITY</i>	-0.003 (-0.91)	0.056 (9.41)	0.010 (2.99)	0.055 (9.51)
<i>ENHANCER</i>	0.236 (1.33)	0.758 (3.11)	0.105 (0.59)	0.766 (3.22)
<i>ISIZE</i>	0.286 (10.71)	0.096 (1.86)	0.114 (4.25)	0.100 (1.95)
<i>RANKING</i>	-0.028 (-4.59)	-0.034 (-3.00)	-0.017 (-2.73)	-0.035 (-3.05)
<i>SYNSIZE</i>	0.032 (4.81)	-0.025 (-2.52)	0.064 (7.82)	-0.027 (-2.71)
<i>CRATE</i>	0.004 (0.19)	-0.061 (-2.00)	-0.003 (-0.18)	-0.063 (-2.06)
		128		
Year dummies	Yes	Yes	Yes	Yes
Country dummies	No	Yes	No	Yes
<i>N</i>	2,689	2,689	2,689	2,689
$\bar{R}^2$	0.325	0.441	0.330	0.452

Table 4.6 Effects of the proximate underwriter on the total bond issue cost in developed and emerging markets

This table reports the effects of proximate underwriter on the total bond issue cost in the subsample of issues from developed markets and from emerging markets, respectively. Among the 31 countries in the sample, emerging markets include Argentina, Brazil, Chile, Mexico, Malaysia, Philippines, South Korea, Poland and Russia. The dependent variable is the total bond issue cost (*TCOST*) in all the five model estimations. Panel A reports the effects of proximate underwriter on a subsample of issues from the developed markets while Panel B on a subsample of issues from the emerging markets. *RATING* measures the bond credit rating. *NONRATE* is a dummy variable that is equal to one if the bond is not rated by either Standard&Poor's or Moody's, and zero otherwise. *MATURITY* is the time period (in years) between the issue date and final maturity date. *ENHANCER* is a dummy variable that takes one if the issue has a credit letter, and zero otherwise. *ISIZE* is the natural log of the gross proceeds in millions of US dollars. *RANKING* measures the lead underwriter's reputation in the primary international bond market on the basis of the prior year market shares. It is a numeric ranging from 1 (lowest rank) to 15 (highest rank). *RANKING* = 0 if the investment bank is not in the top 15 list. If there is more than one lead underwriter in the bond issuance, *RANKING* is set equal to the highest ranking among the lead underwriters. *SYNSIZE* is equal to the total number of lead underwriter(s) and co-manager(s). *CRATE* denotes the issuing company's credit rating. *t* statistics in the parentheses are adjusted for heteroskedasticity (see White (1980)). $\bar{R}^2$ is the adjusted R^2 . Sample period is from year 1999 to year 2005.

	Panel A: Developed markets		Panel B: Emerging markets	
Model	(1)	(2)	(3)	(4)
Intercept	-0.723 (-1.20)	-0.560 (-0.95)	0.591 (0.25)	2.537 (1.07)
<i>DOMESTIC</i>	-0.294 (-2.62)		1.016 (1.81)	
<i>REGIONAL</i>		-0.536 (-4.00)		-1.283 (-3.50)
<i>RATING</i>	1.435 (22.30)	1.419 (22.24)	1.317 (4.19)	1.258 (4.18)
<i>NONRATE</i>	3.927 (13.55)	3.876 (13.52)	4.483 (2.56)	4.331 (2.65)
<i>MATURITY</i>	0.062 (10.21)	0.063 (10.48)	0.025 (2.12)	0.027 (2.63)
<i>ENHANCER</i>	0.496 (1.99)	0.522 (2.15)	1.100 (1.57)	1.170 (1.66)
<i>ISIZE</i>	0.127 (2.31)	0.123 (2.31)	0.043 (0.16)	0.039 (0.15)
<i>RANKING</i>	-0.042 (-3.54)	-0.042 (-3.59)	0.083 (1.85)	0.064 (1.53)
<i>SYNSIZE</i>	-0.020 (-1.99)	-0.016 (-1.57)	-0.113 (-1.18)	-0.149 (-1.56)
<i>CRATE</i>	-0.081 (-2.48)	-0.083 (-2.54)	0.064 (0.75)	0.029 (0.33)
Year dummies	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
<i>N</i>	2,479	2,479	210	210
$\bar{R}^2$	0.408	0.410	0.540	0.490

Table 4.7 Marginal effects of legal environment on the relation between the proximate underwriter and total bond issue cost

This table reports the impact of the legal environment on the relation between the proximate underwriter and total bond issue cost using country random effects regression model. Panel A shows the legal environment impact on the relation between domestic underwriter and total bond issue cost. Panel B shows the legal environment impact on the relation between regional underwriter and total bond issue cost. The dependent variable is *TCOST* in all the model specifications. The two measures for the legal environment are common law dummy (*COMCIV*) and the rule of law index (*RULELAW*) obtained from La Porta et al. (1998). Country-level control variables include the natural log of GDP per capita (*LGDPC*), GDP growth rate (*GDPGROWTH*), market capitalization scaled by current year GDP (*MCAP_GDP*). *RATING* measures the bond credit rating. *NONRATE* is a dummy variable that is equal to one if the bond is not rated by either Standard&Poor's or Moody's, and zero otherwise. *MATURITY* is the time period (in years) between the issue date and final maturity date. *ENHANCER* is a dummy variable that takes one if the issue has a credit letter, and zero otherwise. *ISIZE* is the natural log of the gross proceeds in millions of US dollars. *RANKING* measures the lead underwriter's reputation in the primary international bond market on the basis of the prior year market shares. It is a numeric ranging from 1 (lowest rank) to 15 (highest rank). *RANKING* = 0 if the investment bank is not in the top 15 list. If there is more than one lead underwriter in the bond issuance, *RANKING* is set equal to the highest ranking among the lead underwriters. *SYNSIZE* is equal to the total number of lead underwriter(s) and co-manager(s). *CRATE* denotes the issuing company's credit rating. *t* statistics in the parentheses are adjusted for heteroskedasticity (see White (1980)). $\bar{R}^2$ is the adjusted R^2 . Sample period is from year 1999 to year 2005.

Panel A: Legal environment and domestic bank underwriting

Model	(1)	(2)	(3)	(4)	(5)
Intercept	2.397 (1.87)	1.158 (0.81)	1.348 (0.95)	3.310 (2.54)	1.348 (0.95)
<i>DOMESTIC</i>	-0.219 (-2.00)	-0.190 (-1.78)	-0.495 (-3.32)	-0.176 (-1.63)	-0.495 (-3.32)
<i>RATING</i>	0.131 (2.31)	0.140 (2.46)	0.137 (2.42)	0.137 (2.43)	0.137 (2.42)
<i>NONRATE</i>	-0.006 (-0.57)	-0.008 (-0.82)	-0.007 (-0.70)	-0.009 (-0.90)	-0.007 (-0.70)
<i>MATURITY</i>	0.053 (10.16)	0.056 (10.20)	0.056 (10.14)	0.052 (9.52)	0.056 (10.14)
<i>ENHANCER</i>	1.475 (23.72)	1.495 (23.46)	1.492 (23.60)	1.460 (23.51)	1.492 (23.60)
<i>ISIZE</i>	0.603 (2.29)	0.578 (2.18)	0.569 (2.15)	0.558 (2.02)	0.569 (2.15)
<i>RANKING</i>	4.016 (14.46)	4.021 (14.50)	4.074 (14.45)	3.983 (14.40)	4.074 (14.45)
<i>SYNSIZE</i>	-0.032 (-2.73)	-0.029 (-2.50)	-0.033 (-2.85)	-0.033 (-2.81)	-0.033 (-2.85)
<i>CRATE</i>	-0.074 (-2.32)	-0.065 (-2.08)	-0.064 (-2.06)	-0.085 (-2.60)	-0.064 (-2.06)
<i>LGDPC</i>	-0.415 (-2.09)	-0.236 (-1.08)	-0.243 (-1.12)	-1.881 (-5.95)	-0.243 (-1.12)
<i>GDPGROWTH</i>	-0.056 (-1.38)	-0.027 (-0.63)	-0.031 (-0.74)	-0.010 (-0.22)	-0.031 (-0.74)
<i>MCAP_GDP</i>	0.003 (3.28)	0.005 (4.38)	0.005 (4.37)	0.003 (3.36)	0.005 (4.37)
<i>COMCIV</i>		-0.465 (-3.24)	-0.748 (-4.20)		
<i>RULELAW</i>				3.435 (5.03)	3.146 (4.38)
<i>COMCIV</i> × <i>DOMESTIC</i>	130		0.623 (3.49)		
<i>RULELAW</i> × <i>DOMESTIC</i>					2.277 (2.94)
Year dummies	Yes	Yes	Yes	Yes	Yes
Country dummies	No	No	No	No	No
<i>N</i>	2,689	2,689	2,689	2,654	2,654
$\bar{R}^2$	0.404	0.401	0.402	0.402	0.399

Table 4.7 - Continued
Marginal effects of legal environment on the relation between
proximate underwriter and total bond issue cost

Panel B: Legal environment and regional bank underwriting					
Model	(1)	(2)	(3)	(4)	(5)
Intercept	2.941 (2.41)	1.687 (1.24)	2.192 (1.66)	3.737 (2.99)	5.254 (3.32)
<i>REGIONAL</i>	-0.389 (-3.03)	-0.353 (-2.85)	-0.617 (-3.46)	-0.367 (-2.85)	-2.617 (-1.68)
<i>RATING</i>	0.124 (2.30)	0.134 (2.48)	0.135 (2.50)	0.134 (2.48)	0.136 (2.51)
<i>NONRATE</i>	-0.002 (-0.23)	-0.005 (-0.50)	-0.005 (-0.47)	-0.006 (-0.56)	-0.007 (-0.76)
<i>MATURITY</i>	0.055 (10.50)	0.057 (10.46)	0.057 (10.48)	0.054 (9.83)	0.054 (9.89)
<i>ENHANCER</i>	1.469 (23.84)	1.489 (23.56)	1.484 (23.80)	1.454 (23.62)	1.453 (23.55)
<i>ISIZE</i>	0.596 (2.26)	0.574 (2.16)	0.581 (2.20)	0.559 (2.01)	0.555 (1.98)
<i>RANKING</i>	3.986 (14.54)	3.995 (14.57)	4.001 (14.59)	3.963 (14.49)	3.956 (14.44)
<i>SYNSIZE</i>	-0.032 (-2.75)	-0.029 (-2.53)	-0.033 (-2.85)	-0.033 (-2.83)	-0.034 (-2.89)
<i>CRATE</i>	-0.074 (-2.34)	-0.065 (-2.10)	-0.066 (-2.11)	-0.084 (-2.57)	-0.084 (-2.56)
<i>LGDP</i>	-0.468 (-2.44)	-0.289 (-1.36)	-0.336 (-1.62)	-1.935 (-6.18)	-1.997 (-6.43)
<i>GDPGROWTH</i>	-0.059 (-1.46)	-0.031 (-0.74)	-0.036 (-0.84)	-0.014 (-0.30)	-0.022 (-0.49)
<i>MCAP_GDP</i>	0.003 (3.26)	0.005 (4.32)	0.005 (4.39)	0.003 (3.33)	0.003 (3.33)
<i>COMCIV</i>		-0.443 (-3.16)	-0.892 (-3.78)		
<i>RULELAW</i>				3.482 (5.13)	2.961 (3.76)
<i>COMCIV</i> × <i>DOMESTIC</i>			0.625 (2.82)		
<i>RULELAW</i> × <i>DOMESTIC</i>					1.037 (1.43)
Year dummies	Yes	Yes	Yes	Yes	Yes
Country dummies	No	No	No	No	No
<i>N</i>	2,689	2,689	2,689	2,654	2,654
$\bar{R}^2$	0.406	0.409	0.410	0.402	0.402

Table 4.8 Robustness checks

This table reports the results of a series of robustness tests. Models (1) and (2) report the effect of proximate underwriter on the total bond issue cost by refining the definition of proximity measure, *DOMESTIC* and *REGIONAL*. As to the refined proximity measures, if the foreign bank branches are located in the same country/region as the issuer, they are counted as *DOMESTIC/REGIONAL* underwriter as well. Models (3) and (4) examine the effect of proximate underwriter on the total bond issue cost on a subsample of issues from countries outside the Eurozone. Models (5) and (6) examine the subsample of issues from countries outside the financial centers. The financial centers consist of France, Germany, Japan, the U.K., and the U.S. *RATING* measures the bond credit rating. *NONRATE* is a dummy variable that is equal to one if the bond is not rated by either Standard&Poor's or Moody's, and zero otherwise. *MATURITY* is the time period (in years) between the issue date and final maturity date. *ENHANCER* is a dummy variable that takes one if the issue has a credit letter, and zero otherwise. *ISIZE* is the natural log of the gross proceeds in millions of US dollars. *RANKING* measures the lead underwriter's reputation in the primary international bond market on the basis of the prior year market shares. It is a numeric ranging from 1 (lowest rank) to 15 (highest rank). *RANKING* = 0 if the investment bank is not in the top 15 list. If there is more than one lead underwriter in the bond issuance, *RANKING* is set equal to the highest ranking among the lead underwriters. *SYNSIZE* is equal to the total number of lead underwriter(s) and co-manager(s). *CRATE* denotes the issuing company's credit rating. *t* statistics in the parentheses are adjusted for heteroskedasticity (see White (1980)). $\bar{R}^2$ is the adjusted R^2 . Sample period is from year 1999 to year 2005.

Model	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.029 (0.05)	0.202 (0.38)	-0.891 (-1.51)	-0.558 (-0.93)	0.388 (0.42)	1.292 (1.45)
<i>DOMESTIC</i>	-0.435 (-3.81)		-0.621 (-4.19)		-0.363 (-1.74)	
<i>REGIONAL</i>		-0.663 (-5.07)		-0.647 (-4.52)		-0.863 (-3.85)
<i>RATING</i>	1.471 (24.39)	1.449 (24.17)	1.474 (21.03)	1.474 (20.96)	1.842 (16.71)	1.791 (16.78)
<i>NONRATE</i>	4.036 (13.96)	3.973 (13.91)	3.404 (6.69)	3.411 (6.61)	5.408 (10.62)	5.291 (10.74)
<i>MATURITY</i>	0.056 (9.30)	0.057 (9.53)	0.051 (8.08)	0.051 (8.37)	0.039 (4.84)	0.041 (5.32)
<i>ENHANCER</i>	0.808 (2.97)	0.807 (3.05)	0.754 (1.78)	0.675 (1.56)	0.935 (1.86)	0.996 (2.01)
<i>ISIZE</i>	0.139 (2.55)	0.139 (2.60)	0.366 (5.16)	0.359 (5.11)	-0.029 (-0.27)	0.002 (0.02)
<i>RANKING</i>	-0.035 (-3.08)	-0.038 (-3.32)	-0.037 (-2.39)	-0.035 (-2.22)	-0.058 (-2.74)	-0.068 (-3.15)
<i>SYNSIZE</i>	-0.022 (-2.21)	-0.019 (-1.88)	-0.060 (-4.81)	-0.058 (-4.66)	-0.046 (-1.90)	-0.040 (-1.68)
<i>CRATE</i>	-0.069 (-2.24)	-0.073 (-2.39)	-0.085 (-2.35)	-0.092 (-2.53)	-0.063 (-1.28)	-0.077 (-1.58)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	2,689	2,689	1,689	1,689	902	902
$\bar{R}^2$	0.437	0.441	0.469	0.471	0.565	0.573