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Macro Corporate Governance and the Price Sensitivity of Rivals at Acquisition Announcements

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A thesis submitted to the University of New South Wales in fulfilment of the requirements for the degree of Master of Philosophy

ORIGINALITY STATEMENT

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Signed …….....

Date …….....

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Abstract

This thesis investigates the role of macro corporate governance in determining the price sensitivity of rivals at acquisition announcements by employing a large sample of 8006 mergers and acquisitions (M&As) and related rival firms across 46 countries spanning January 1990 to December 2009. The empirical results show that macro corporate governance and legal environments have significant impacts on abnormal returns to rivals at acquisition announcements. More specifically, a stable political situation, efficient regulation enforcement, strict corruption control, the absence of daily share price limits, good shareholder protection as well as high financial information transparency increase the abnormal returns to rivals, whereas strong creditor rights reduces the price sensitivity of rivals. Moreover, the results remain valid if we employ firm-level corporate governance, that is, rivals with better firm-level corporate governance ratings exhibit high price sensitivity at M&A announcements. Our results are not driven by the dominant sample country, and are valid even after controlling for deal types (horizontal/vertical/conglomerate/cross-border), firm-level characteristics (relative firm size, book-to-market ratio, dividend payout ratio, return on equity, price-earnings ratio, stock return volatility, earning management, debt-to-equity ratio, stock turnover, firm growth), industry concentration and stock market development.

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1. Introduction

Mergers and acquisitions (M&As) are of great importance in corporate finance. Publicly traded acquirers, targets as well as rivals experience significant abnormal returns at acquisition announcements (see e.g. Eckbo, 1983 & 1985; Eckbo & Wier, 1985; Song & Walkling, 1993 & 2000; Fee & Thomas, 2004; Akdogu, 2009). Traditional takeover literature examines the relationships between abnormal returns and a handful of influencing factors such as the types of deals, firm-level characteristics and industry structures. Recently, takeover literature has realised strong influences of macro corporate governance on M&As. For example, Rossi & Volpin (2004) find that the volume of M&A activity and the probability of an all-cash bid are influenced by the level of shareholder protections. They also find that corporate governance of the target firm can be improved by cross-border transactions. Bris & Cabolis (2008) attribute higher merger premiums in cross-border takeovers to better shareholder protection and accounting standards in the countries of the acquirers. However, few studies have related the price movements of rivals at acquisition announcements to macro corporate governance environments. Therefore, this thesis fills in the research gap by examining the impacts of macro corporate governance on the price sensitivity of rivals at acquisition announcements.

Macro corporate governance can enhance the rival's response at least from two aspects. First, information transparency is high and illegal transactions in share market are better oversighted in countries with better corporate governance; thus, the information is more reliable and accurate when originally released. Second, corporate risk-taking is more encouraged and the agency cost of large shareholders expropriating minority shareholders is reduced in countries with better corporate governance. Therefore, investors are more ready to genuinely believe the news released.

We define the price sensitivity of rivals at acquisition announcements as the abnormal returns to rivals. Abnormal returns are regressed on sets of influencing factors. We use various proxy variables with regard to macro corporate governance, e.g. political stability, government efficiency, enforcement quality, shareholder and creditor rights, information transparency, and legal origins. We also control for deal types, firm-level characteristics, industry structure and stock market development in every sample country.

Our results provide convincing evidence that in countries with stable political situations, with robust legal systems, with strict regulation enforcement and corruption control, rival firms exhibit higher price sensitive at M&A announcements. One possible reason is that superior governance environments enhance regulation enforcement against illegal behaviours such as informed trading. Therefore, the degree of surprise associated with M&As are protected and the impacts of M&As on rivals are not released until the official announcements are made. In addition, we also find that the abnormal returns to rivals at M&A announcements are generally higher in countries without daily share price limits.

We find that shareholder protection exhibits a positive relationship with the price sensitivity of rivals at acquisition announcements. This result can be explained by the fact that good shareholder protection encourages corporate risk-taking (John, Litov & Yeung, 2008); hence rival firms operating risky projects are more sensitive to external shocks generated by M&As. This result is also supported by classical agency theory (Jensen & Meckling, 1976) in that good corporate governance reduces expropriations on the outsiders. So if acquisitions signal positive information, investors are willing to bid higher prices for the shares of rivals with less a fear of being expropriated by the insiders. Finally, better corporate governance also means less anti-takeover provisions. According to Song & Walkling (2000), the higher probability for the rivals to become new takeover targets in the future is, the higher abnormal returns earned by such rivals are when the initial takeover announcement was made.

Our results indicate that information transparency is positively related to the price sensitivity of rivals. We find that the price sensitivity of rivals is higher in countries with stronger accounting and auditing standards, with strict disclosure requirements and liabilities, with better media development, with more active participation of analysts, and with a larger proportion of private ownership in media firms. High information transparency improves the availability, timeliness and credibility of financial information. Investors are more confident in choosing their strategies. Therefore, they are likely to achieve consensuses about the business fundamentals of firms facilitated by abundant information. Hence, similar actions of investors ultimately exacerbate the price movements of rivals at M&A announcements. The development of media networks and participation of financial analysts excavates private yet valuable information which could have profound impacts on the share prices of some rivals. Last, a large proportion of private ownership in media strengthens the monitoring mechanisms of media firms, thus reducing the likelihood of corruption (Djankov *et al.*, 2003; Houston, Lin &

Ma, 2010). Therefore, private ownerships in media promote information transparency, and in turn increase the abnormal returns of rivals at acquisition announcements.

The strength of creditor rights conversely exhibits a negative relationship with the price sensitivity of rivals. We focus on the legal protection of creditors. In our results, stronger creditor rights reduce the magnitude of abnormal return to rivals at acquisition announcements. One possible explanation is that when positive information arrives, shareholders have to share extra benefits with creditors instead of being the sole beneficiaries. The second possible reason to smaller abnormal return under the condition of strong creditor rights is that rival firms are less prone to take on risky projects (John, Litov & Yeung, 2008) because powerful creditors are inclined to impose restrictive covenants in lending contracts (Nini, Smith & Sufi, 2009). Operating fewer risky projects means rivals are less subject to changes in market conditions, and therefore show lower price sensitivity to M&A activities.

This thesis documents that the price sensitivity of rivals are higher in countries of common law origin than in countries of civil or Scandinavian law origin. This result is supported by the argument that common law countries have better macro corporate governance environments (La Porta *et al.*, 1998; La Porta, Lopez-De-Silanes & Shleifer, 2006; La Porta, Lopez-de-Silanes & Shleifer, 2008).

We conduct the first robust test by excluding all U.S. rival firms because nearly 60% of M&A deals involve a U.S. target. The above results remain valid for non-U.S. countries. Therefore, our empirical results are not driven by the dominant sample country. In the second set of robust tests, we collect firm-level corporate governance indices and test their impacts on the price sensitivity of rivals. The results are consistent with that of macro corporate governance indices because better firm-level corporate governance increases the abnormal returns to rivals.

This thesis contributes to the current literature from the following aspects:

1. To our best knowledge, it is the first study conducting a comprehensive investigation into the relationships between macro corporate governance environments and the abnormal returns to rivals at M&A announcements. We discover a strong connection between the price sensitivity of rivals at M&A announcements and macro corporate governance environments. Our results shed light on the close nexus between country-level policies and financial markets. Hence, it provides

insightful information not only for academic researchers but also for policy makers and investors.

2. Prior takeover literature is often limited by a small sample size, short time horizon or single country scope. This thesis overcomes these limitations by compiling a large sample of 8006 acquisitions and rivals across 46 countries over a 20-year period from 1990 to 2009. Our results facilitate the understandings of M&As and macro corporate governance from an international perspective.
3. Information environments attract little attention up to this point. This thesis highlights the significance of information environments in determining the price sensitivity of rivals at M&As. We find that high information transparency significantly increases the price sensitivity of rivals at M&A announcements.
4. Finally, our results indicate that the price sensitivity of rivals at acquisition announcements is higher in more concentrated industries. We complement the literature on industry structure and stock returns, e.g., Hou & Robinson (2006).

The organisation of this thesis is as the follows. Section 2 provides a review of relevant literature. Section 3 proposes empirical hypotheses with regard to macro corporate governance environments, and also introduces proxy variables. In section 4 and 5, we explain the data and methodology. Section 6 presents and discusses empirical results. Robust tests are implemented in Section 7. Section 8 concludes.

2. Literature Review

2.1 Intra-Industry Impacts of M&As

The impacts of merger and acquisition activities are obviously not limited to the targets and the acquirers. In fact, a large body of takeover literature has documented pronounced intra-industry impacts (or the spill-over effects) at the announcements. Rival companies also experience noticeable abnormal returns. Many theories have been proposed to explain the observed intra-industry impacts on rivals, and these theories belong to two general categories: positive enhancements and negative detriments.

For the former, one possible reason for extra positive returns is attributed to a low competition level caused by collusions among remaining firms after horizontal mergers. Horizontal deals reduce the number of players in an industry, thus increasing industry concentration as well as the monopoly power of remaining companies. Collusions among surviving firms enable them to limit outputs and raise product prices and/or lower factor prices (Akhigbe & Madura, 1999). Another stream of literature emphasises the information mechanism of M&As arguing that acquisition announcements reveals asymmetric information that the acquirer is aware of the target's potential value which has not been realised by the general public. Although the hidden value of the target could be firm specific, it may alternatively be systematic to the whole industry (Akhigbe & Madura, 1999). In this situation, the upward valuation effect on a single target spreads over the corresponding industry and benefits all rivals of the target. The revised valuation effect may be attributed to the increased probability for rivals to become takeover targets in the future (Akhigbe & Madura, 1999; Song & Walkling, 2000). Furthermore, M&As can signal other beneficial information. For example, the model built by Mccardle & Viswanathan (1994) indicates that the acquisition means the acquirer itself is a weak competitor as it is not strong enough to enter a new market directly. The rivals of the acquirer will consequently gain extra returns because they have identified a weak competitor. Finally, a possible reason for positive abnormal returns is that the target receives higher technical efficiency from its foreign bidder. Rivals of the target will eventually gain from technology or productivity improvement through interactions with the target (Ip & Otchere, 2006).

On the other hand, the latter postulates that rivals experience negative returns in that they are disadvantaged by acquisitions. One common rational is that rivals will be facing a more powerful (tougher) competitor (Eckbo, 1983; Eckbo & Wier, 1985). The target may receive managerial synergy, or improve production efficiency, or obtain technology privileges, making rivals lose comparative advantages. Moreover, the foreign acquirers disturb the current balance of domestic markets through capital or technology injections to the targets. As a result, the comparative advantages of domestic rivals are weakened, resulting in price downfalls (Ip & Otchere, 2006). Industry structure is another possible explanation to abnormal returns. High industry concentration dampens firms' willingness of innovation or risk-taking, and ultimately lowers firms' future returns (Hou & Robinson, 2006). Because investors expect to see a higher industry concentration following horizontal M&As, they tend to bid lower prices for remaining firms. In cases of vertical integrations, the newly integrated firms can push the costs of rivals higher either by driving up the price of a scarce input (Riordan, 1998) or by increasing market power in the upstream markets (Ordover, Saloner & Salop, 1990; Fee & Thomas, 2004). From the perspective of information signalling, Jovanovic & Braguinsky (2004) argue that a merger announcement sends out negative information that the acquirer has exhausted its internal growth opportunities. This message may be broadly interpreted as lack of development opportunities in the scope of whole industry. Therefore, the rivals of the acquirer suffer price drops. Last, the behaviour finance literature proposes an alternative explanation that negative abnormal returns are caused by the existence of herd investment behaviours (Scharfstein & Stein, 1990; Zwiebel, 1995). Manages may herd in acquisition decisions for the sake of good reputations, although hasty acquisitions are very likely to be value-destroying.

From the discussion above, we can see that no consensus on the intra-industry impacts at M&A announcement has been achieved so far. Putting aside the disputations about the reasons for abnormal returns, researchers have also noticed a striking cross-sectional variation in abnormal returns to rival firms. The stock prices of some rivals exhibit significant deviations at M&A announcements, whereas the price changes of others are not obvious (Song & Walkling, 2000). Prior literature has examined some influencing factors correlated with the magnitude of abnormal returns to rivals at acquisition announcements.

2.2 Influential Factors on Abnormal Returns to Rivals

Prior studies find that some firm-level characteristics exhibit relationships with the abnormal returns to rivals at M&A announcements. For example Akdogu (2009) documents a significant size effect in M&As of telecommunication industry. She finds that smaller rivals suffer larger negative abnormal returns. Song & Walkling (2000) argue that rival firms who have similar financial status to the initial targets are more likely to become subsequent targets. Therefore, these rivals experience higher abnormal returns at the initial M&A announcements. In specific, they find abnormal returns to rivals of the targets are negatively correlated with firm growth, but positively related to leverage. Song & Walkling (1993) observe that high managerial ownerships decrease the probability of becoming a target. However, the targets with high managerial ownerships earn significantly higher abnormal returns. Song & Walkling (2000) confirm that abnormal returns to rivals with high managerial ownerships are relatively lower. In addition, the type of M&A is under examination as well. Eckbo (1983) does not find significant differences in abnormal returns to rivals between horizontal and vertical deals, while Akdogu (2009) discovers that in telecommunication industry vertical deals generate lower abnormal returns to rivals. Furthermore, industrial structures may also determine intra-industry impacts of M&As. Mitchell & Mulherin (1996) attribute industry clustering of M&As in the U.S. during the 1980's to external economic shocks, and argue that certain common factors would affect takeovers in an industry. Akhigbe & Madura (1999) and Song & Walkling (2000) adopt Herfindahl index as the measure of industry concentration and discover a significant negative relationship between the concentration ratio and abnormal returns to rivals. Ip & Otchere (2006) find a similar relationship in their study of cross-border M&As.

2.3 Macro Corporate Governance and Laws

So far, previous studies have associate the abnormal returns to rivals with characteristics of deals, firms and industries, but few of them focus on the role of corporate governance in explaining the cross-sectional variations in abnormal returns to rivals. Agency problems prevail in the modern corporate structure due to the separation of ownership and management (Jensen & Meckling, 1976). The investments from the outsides may not materialise because the insiders are able to expropriate outsiders by taking the advantage of information

asymmetry. Corporate governance is introduced to minimise agency costs and protect the outsiders from the expropriation of the insiders (La Porta *et al.*, 2000). Corporate governance is therefore heavily involved in takeover activities. For example, Masulis, Wang & Xie (2007) argue that the acquiring firms with inferior corporate governance experience significantly lower abnormal returns during the announcement periods. Wang & Xie (2009) argue that firm-level corporate governance is transferable from the acquirers to the targets, so the synergy of acquisition is higher when the acquirers possess better corporate governance than the targets. In Korean market, Lee & Park (2009) find that non-target rivals with poor corporate governance receive higher abnormal returns when the Korea Corporate Governance Fund issue investment announcements. However, the Korean Corporate Governance Fund does not intend to obtain a control position, hence the investment announcements in their study are not traditional acquisition announcements.

Previous takeover literature mainly focuses on firm-level corporate governance. Until recently scholars pay more attention to macro corporate governance especially laws and regulations. Legal protection for investors has become a fruitful way to think about corporate governance (La Porta *et al.*, 2000). Pioneered by La Porta *et al.* (1997, 1998), many studies contribute measures of macro corporate governance globally. Facilitated by the increasing availability of data, some researchers have uncovered the correlation between macro corporate governance and legal environments and several economic phenomena. Li *et al.* (2006) suggest that strong macro corporate governance encourages more concentrated institutional holdings. Additionally, companies with better shareholder protection are prone to take on more risks, whereas stronger creditor rights reduce corporate risk-taking (John, Litov & Yeung, 2008; Paligorova, 2010). Johnson *et al.* (2000) find that countries with weak legal systems are more vulnerable to the Asian Financial Crisis.

Recently, macro corporate governance and legal environments have been occasionally examined in the context of acquisitions. For example, Rossi & Volpin (2004) find that the volume of M&A activity and the probability of an all-cash bid are influenced by the level of shareholder protections. They also find that the target firm corporate governance can be improved by cross-border transactions. Bris & Cabolis (2008) find that better shareholder protection and accounting standards in the acquirer's country is positively related to merger premiums in cross-border M&As. This relationship is more profound when the foreign acquirer obtains 100% of the target. Acemoglu, Johnson & Mitton (2009) discover higher probability of

vertical integrations in countries with both higher contracting costs and more developed capital markets. The literature highlights the importance of macro corporate governance and legal protection of investors in understanding phenomena around M&As.

Good quality of governance is also important in maintaining adequate information transparency, which is critical to financial markets. Markets may fail to allocate resources efficiently without sufficient reliable information (see e.g. Akerlof, 1970). Healy & Palepu (2001) summarise that information disclosure is closely related to stock prices. Diamond & Verrecchia (1991) suggest that firms, especially large firms, benefit from voluntary information disclosure. Other empirical studies also support the view that high information transparency facilitates the development of financial markets (Barth, Caprio & Levine, 2004; La Porta, Lopez-De-Silanes & Shleifer, 2006). Information transparency also directors the capital flows of international funds (Gelos & Wei, 2005). In this thesis, information transparency is of particular importance because we examine the price sensitivity of rivals around M&A announcements.

3. Hypotheses and Proxies

In this section, we posit main empirical hypotheses with regard to macro corporate governance and legal environments, and discuss the rationales of proxy selection.[1] By the end of this section, we briefly review other control variables used in regressions.

3.1 Empirical Hypotheses

Hypothesis 1: Rival firms in countries with higher political stability, superior government efficiency, strong regulation enforcement, and stricter corruption control show GREATER price sensitivity at M&A announcements.

In countries with stable political situations and high government efficiency, the financial market is sheltered away from unnecessary political or social disturbances. La Porta *et al.* (1997, 1998 & 2006) find evidence that good quality of governance is usually associated with more developed financial markets in which financiers are willing to provide capital. Furthermore, we emphasise the role played by the law enforcement. Strict enforcement greatly reduces illegal economic behaviours which are harmful to market efficiency. Although most countries prohibit informed trading, malicious conspiracies and market manipulations, corruption will weaken the enforcement of prohibitions, and lower the price sensitivity of rivals when M&As are announced.[2] One possible reason is that traders with private information may have obtained illegal profits by speculating before M&A announcements, leaving the real impacts of announcements unobvious. On the contrary, we expect efficient enforcement against illegal trading protect the degree of surprise associated with acquisition announcements, and expect to see larger magnitude of abnormal returns to rivals when the announcements are officially disclosed.

[1] For details about variable definition, calculation and source of information please refer to Appendix A.

[2] Although other literature e.g. Du & Wei (2004) find strong evidence that insider trading increases market volatility, our hypothesis is not in contrast to prior literature. We measure the magnitude of abnormal returns over a 5-day event window around the announcement; therefore, the high volatility of stock prices caused by insider trading may occur before or after the window.

Additionally, regulatory restrictions of security exchanges may also affect the price sensitivities. The share price of a company is a reflection of financial fundamentals, so it ought to be at equilibrium if not purposely manipulated. However, in reality, many stock exchanges impose mandatory daily price limits to narrow down the temporary price fluctuations. Daily price limits are frequently observed in Asian markets. For example, China currently enforces a limit of +/- 10% based on the price in the last trading day.[3] Exchanges in Korea and Thailand impose +/- 15% and +/- 30% restrictions respectively.[4] These price limits directly shrink the magnitude of price movements, hence would reduce the price sensitivity of rivals at M&A announcements. In other countries without such limits we expect to observe larger price volatility following acquisition announcements.

We collect the World Governance Indicators compiled by the World Bank as a primary set of proxy variables for macro governance. The World Governance Indicators (WGI) covers six dimensions of macro governance: Voice and Accountability (K1); Political Stability and Absence of Violence/Terrorism (K2); Government Effectiveness (K3); Regulatory Quality (K4); Rule of Law (K5); and Control of Corruption (K6). These indicators are aggregated for 212 countries and territories over the period of 1996–2009, and are the combination of views of large numbers of enterprise, citizen and expert survey respondents. Historical WGI values are reported in 1996, 1998, 2000, and annually for 2002–2009. Kaufmann, Kraay & Mastruzzi (2009) emphasize that "governance can and does even change over relatively short periods of time"; therefore to achieve the best precision we use reported WGI value of each country in every reporting year. For the years without reported WGI, we do the following adjustments: for WGI scores in 1997, 1999 and 2001, we take the mean value of the WGI scores in the years immediately before and after e.g. WGI in 1999 is the mean value of WGIs in 1998 and 2000. For the period earlier than 1996, we use WGI score in 1996 as an approximation.

The quality of regulations in stock exchanges are directly related to share prices, therefore, we collect The Regulation of Security Exchange (WEFEx) from The Global Competitiveness Report 2009-2010 to proxy for exchange regulations. WEFEx is a perception

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[3] See Shanghai and Shenzhen Stock Exchange in China
http://www.sse.com.cn/sseportal/en/c01/c09/c01/p1075/c15010901_p1075.shtml.
http://www.szse.cn/main/en/rulseandregulations/sserules/200609259304.shtml.

[4] See Korea Exchange
http://eng.krx.co.kr/m7/m7_4/m7_4_1/m7_4_1_1/UHPENG07004_01_01_04.html.
See The Stock Exchange of Thailand
http://www.set.or.th/en/products/trading/equity/tradingsystem_p3.html.

based variable because its value is derived from the Executive Surveys conducted by the World Economy Forum. Perception based variables have advantages that they not only capture theoretical quality of regulations, but also reflect the strength of enforcement in reality. Together, we use K1 – K6 and WEFEx as the primary set of variables for macro governance.

The other three legal variables - Efficiency of Judicial System (LawEff), Rule of Law (RuleLaw) and Corruption (Corruption), are collected from La Porta *et al.* (1998). They specifically capture the legal tradition and quality of enforcement across different countries. In fact, the criteria of LawEff, RuleLaw and Corruption are very similar to that of K3 – K6 above. LawEff, RuleLaw and Corruption have a drawback that they are relatively outdated reflecting situations in late 1980's to early 1990's. We use these three as alternative variables.

Finally, we employ a dummy variable (No Price Limit) indicating whether stock exchanges in a given country impose daily price limits. The dummy variable equals 1 if no limits are imposed and 0 otherwise. We hypothesize that the price sensitivity of rivals is higher in countries without daily price limits.

Hypothesis 2: Rival firms in countries with stronger shareholder rights show GREATER price sensitivity at M&A announcements.

According to classical agency theory (Jensen & Meckling, 1976), shareholder protection mitigates agency conflicts between the outsiders and the insiders. La Porta *et al.* (2000) also suggest that better corporate governance lowers the possibility of expropriations by the insiders, so investments of the outsiders can materialise. When M&A announcements bring positive information to rival firms, the outsiders revaluate the share prices of rival values higher because their entitlements to extra returns are protected from expropriations.

Higher price sensitivity can be attributed to a propensity to corporate risk-taking when shareholder rights are strong. John, Litov & Yeung (2008) and Paligorova (2010) argue that good corporate governance minimises managers' self-interests, therefore reduces managers' over-conservativeness in project screening. Consequently, strong shareholder rights encourage firms to take risky projects. In general, the revenues of risky projects are more likely to be subject to external market conditions. Therefore risky projects are more likely to bring higher abnormal returns if acquisition announcements signal positive information.

Another possible reason is that strong shareholder rights are associated with fewer anti-takeover provisions (Masulis, Wang & Xie, 2007; Bebchuk, Cohen & Ferrell, 2009). Therefore these firms are more likely to be acquired (Chava, Livdan & Purnanandam, 2009). According to Song & Walkling (2000), rivals tend to experience larger abnormal returns if they are likely to become target in the future. Therefore, we reasonably conjecture that stronger shareholder protections will yield higher price sensitivity of rivals at acquisition announcements.

We select several sets of variables measuring the rights of shareholders. First, three versions of anti-director indices are employed. The original index (OldAntiDir) was constructed by La Porta *et al.* (1998) depicting the strength of shareholder protection. Two other versions (PVAntiDir, NewAntiDir) are constructed by Pagano & Volpin (2005) and Djankov *et al.* (2008) respectively. Second, anti-self dealing indices (AntiSelf PrivateEnfor and AntiSelf PubEnfor) from Djankov *et al.* (2008) are used as they pertain to the central problem of self-dealing in corporate governance. Third, other survey-based variables, e.g. Ethical Behaviour of Firms (WEFEth), Efficacy of Corporate Boards (WEFBoard), Protection of Minority Shareholders' Interests (WEFMinor), and Strength of Investor Protection (WEFInvP) are collected from The Global Competitiveness Report issued by World Economy Forum.

Hypothesis 3A: Rival firms in countries with higher information transparency show GREATER price sensitivity at M&A announcements.

Hypothesis 3B: Rival firms in countries with higher information transparency show SMALLER price sensitivity at M&A announcements.

These two hypotheses are closely related to the information environment which plays a crucial role in maintaining financial market. Information transparency particularly refers to the timeliness, availability and credibility of financial information in this thesis. As mentioned in Section 2, high information transparency facilitates the development of financial markets (Healy & Palepu, 2001; Barth, Caprio & Levine, 2004; La Porta, Lopez-De-Silanes & Shleifer, 2006). More importantly, higher credibility of financial information helps investors correctly evaluate financial fundamentals of surviving rivals. We conjecture in countries with high information transparency, investors are more likely to achieve consensual opinions and consequently adopt similar trading actions. Consequently, homogeneous trading actions further exacerbate the price movements of rivals at M&A announcements.

On the other hand, we should consider an alternative outcome of high information transparency. High information transparency may yield information leakages, thus the market would hear some rumours before the official announcements. Rumours reduce the degree of surprise associated with the announcements, and public investors can conduct ex ante speculations. Accordingly to Song & Walkling (2000), low degree of surprise results in lower magnitude of price responses. Therefore, higher information transparency can also be negatively related to the price sensitivity of rivals at M&A announcements. However at this stage, we are uncertain about the dominate effect of information transparency.

The quality of accounting and auditing standards determines the scope, accuracy and timeliness of information disclosure. We select two accounting standard indices from La Porta *et al.* (1998) and Bushman, Piotroski & Smith (2004), and name them AcctStd90 and AcctStd95. AcctStd90 stands for the quality of accounting standards in various countries in 1990 and AcctStd95 reflects the situations in 1995. These two indices are based on disclosure or omission of 90 items in annual reports of at least three companies in each country, so higher values means higher information transparency. We select a proxy (Audit) for the auditing quality around the world from Bushman, Piotroski & Smith (2004). We also include another auditing quality index (WEFAudit) from the Global Competitiveness Report. In addition, we employ prospectus disclosure index (ProsDisc) and prospectus liability index (ProsLia) from La Porta, Lopez-De-Silanes & Shleifer (2006). ProsDisc captures the extent of disclosure when firms are to issue new equities, while ProsLia captures the liability of providing false, omitted or misleading information.

Furthermore, we examine three additional dimensions of information environment: 1) media development, 2) participation of professional analysts, and 3) media ownerships. Media development is closely related to information transmission in that established media networks enable timely broadcast of information. Active participation of analysts helps the public to acquire and digest private yet valuable information, which could have tremendous impacts on the price sensitivity of rivals. Data of media development (Media dev) and participation of analysts (Analyst) are from Bushman, Piotroski & Smith (2004). Recent literature also documents that media ownerships are closely related to governance efficiency. For example Djankov *et al.* (2003) find that a high level of state ownership in media (newspapers, TV and radio) is closely related with inferior governance efficiency, less developed capital markets and fewer political rights. Houston, Lin & Ma (2010) discover that bank corruption is more frequent

in countries with high state ownerships in media, so they argue that state ownerships in media accentuate monitoring and supervision mechanism of media firms. Therefore, the ownership structure of media firms is a new but meaningful perspective to examine information environment. Media ownerships variables (Press State (Count), Press State (MShare), TV State (Count), TV State (MShare), Press Private (Count), Press Private (MShare), TV Private (Count) and TV private (MShare)) from Djankov *et al.* (2003).

Hypothesis 4: Rival firms in countries with stronger creditor rights show SMALLER price sensitivity at M&A announcements.

Intuitively, if M&A announcements bring positive information to rivals and no creditors exist, shareholders receive all benefits. However, shareholders have to share excessive returns with creditors if the entitlements to creditors in the firm are substantial. Consequently, the share prices of rivals are not as high as expected as creditors take partial benefits.

Stronger creditor rights grant lenders more controlling power over the operations of the borrowing firm. For example, John, Litov & Yeung (2008) and Nini, Smith & Sufi (2009) find that lenders are inclined to introduce restrictive covenants in loan contracts thus limiting capital expenditures of the borrower. The borrowing firm is consequently less likely to take on risky projects. Rival firms are less sensitive to external shocks such as M&A announcements if they operate fewer risky projects. Therefore with relative low expectations of investors, rivals should receive less excessive abnormal returns.

We use two versions of creditor rights indices to estimate creditor protection in each country. The original creditor rights index (Creditor Rights) is from La Porta *et al.* (1998) and the updated version (New Creditor Rights) is from Djankov, Mcliesh & Shleifer (2007). We expect a negative relationship with the price sensitivity of rivals and the creditor rights indices.

Hypothesis 5: Rival firms in countries of common law origin show GREATER price sensitivity at M&A announcements.

According to the theory of legal origin (see e.g. La Porta *et al.* (1998), La Porta, Lopez-De-Silanes & Shleifer (2006) and La Porta, Lopez-de-Silanes & Shleifer (2008)), common law

countries possess better macro corporate governance environments. We hypothesize that the price sensitivity is higher in countries of common law origin than in countries of civil or Nordic law origin. We use a dummy variable (Comlaw) to distinguish countries of different legal origins. The dummy variable is from Djankov *et al.* (2008).

3.2 Other Control Variables

Finally we briefly review other control variables[5] included in our regressions, and posit their possible impacts on the price sensitivity of rivals.

Firm size

On the one hand, it is more likely for small rival companies to become future acquisition targets, and hence such rivals experience higher positive abnormal returns (Akhigbe & Madura, 1999; Song & Walkling, 2000). Besides, smaller firms may be more vulnerable to market fluctuation and hence are more likely to experience high price movements. In both cases, small rivals are expected to earn higher abnormal returns at the announcements. However on the other hand, larger surviving rivals have more market power and may benefit more from the collusion after the M&As. In such cases, large rivals should receive higher abnormal returns thus are more price sensitive to the announcements.

Apart from traditional economics meanings, firm size carries an implication of information transparency. Large firms attract more public scrutinies, so their financial information is more transparent under external pressures. On the other hand, high information transparency of large firms is driven by internal desires. For instance, Diamond & Verrecchia (1991) argue that information disclosure helps reduce the cost of capital and large firms are willing to disclose more because of more cost savings. Accordingly, we assume that larger firms disclose more financial information than smaller ones do. Although we conjecture that growing firm size improves information transparency, the relationship between information transparency and the price sensitivity of rivals is uncertain as mentioned in Hypothesis 3.

[5] Please refer to Appendix A for details of definition, calculation and source of information.

Based on the analysis above, the relationship between firm size and the price sensitivity of rivals is unclear at this point. We use two formats of firm size: absolute firm size (LogSize) and relative firm size (Rela_size).

Book-to-market ratio

Generally, a high book-to-market ratio (LogBM) indicates a low growth prospect and thus higher probability for the firm to become the next target. So companies with high book-to-market ratios should welcome M&As. We hypothesize the book-to-market ratio to be positively related with the price sensitivity.

Dividend payout ratio

A high dividend payout ratio (Dpay) is associated with a low cash flow uncertainty (Chay & Suh, 2009). This type of cash flow uncertainty may be interpreted as lack of grow opportunity. Therefore, rivals paying high dividend may earn less abnormal returns and we expect the dividend payout ratio to have a negative relationship with the price sensitivity of rivals at M&A announcements.

Leverage

Firms with high leverage (DE) usually incur heavier financial distress costs and are subject to greater default risk. They tend to be more sensitive to external shocks because any changes of the market conditions would have influences on their operations. Song & Walkling (2000) find that firms with bigger leverage ratios earn higher positive abnormal returns. Perhaps, high leverage ratio could yield high price sensitivity of rivals. On the other hand, earlier literature such as Palepu (1986) and Song & Walkling (1993) find that high leverage reduces the probability of rivals to become targets. Hence, high leverage should reduce the magnitude of abnormal returns to rivals at M&A announcements. Therefore, the prevailing impact of leverage on the price sensitivity of rivals is uncertain.

Stock turnover

High stock turnovers (Turnover) mean active participation of investors. Therefore, upon the arrival of new information, the share prices should experience a greater magnitude of fluctuation.

Firm growth

A rival firm with large sales growth (SalesG) exhibit a good profitability, thus is less sensitive to adverse impacts of tough competitors. Palepu (1986) document a significant negative relationship between firm growth and the probability to be acquired. Song & Walkling (1993 & 2000) confirm a negative relationship between firm growth and abnormal returns to rivals. In line with prior literature, we expect the rival with a high sales growth rate to be less sensitive to M&As.

Return on equity

High return on equity (ROE) indicates high profitability of the rival. Well-performed rivals are expected to earn higher abnormal returns. We conjecture that higher ROE increases the price sensitivity of rivals at M&A announcements.

Price-to-earnings ratio

A high price-to-earnings (PE) ratio implies over-pricing. So a high PE ratio reduces the abnormal returns to rivals.

Cash flow uncertainty

Firms with high cash flow uncertainties may be weak in performance. We follow Chay & Suh (2009) to proxy cash flow uncertainty by the volatility of stock return (SRVOL), and hypothesise that operating risk is negatively correlated with the abnormal returns to rivals at M&As.

Earnings management

Earnings management or accounts manipulation (Accr) distorts financial information hence is unfavoured by investors. Dechow, Sloan & Sweeney (1995) and Leuz, Nanda & Wysocki (2003) find that the magnitude of total accruals is an effective measurement of earning management. We follow their methodology of measuring earnings management by total accruals, and expect rival firms which manipulate accounts receive smaller excessive returns.

Industry concentration

Hou & Robinson (2006) link stock returns to the industry structure. They attribute low stock returns in concentrated industries to high entry barriers or low innovation incentives. Song & Walkling (2000) discover that rivals in more concentrated industries earn significantly lower abnormal returns than in competitive industries. In addition, government intervenes such as antitrust investigations make the probability of future M&As in concentrated industries smaller. Following the above analysis, industry concentration is expected to be negatively related to the price sensitivity of rivals. Sales based Herfindahl index (Helf) is used to measure industry concentration.

Horizontal/ vertical /conglomerate/cross-border M&As

The acquirers and the targets of conglomerate deals are from irrelevant industries, so we conjecture that conglomerate acquisitions (Dcon) only happen when there are substantial incentives for the acquirers to initiate takeovers. We hypothesize that the intra-industry impacts of conglomerate acquisitions are the strongest. Rival firms in horizontal acquisitions may receive extra benefits from collusions, so we expect lower abnormal returns to rivals of vertical deals (Dver) than that of horizontal deals.

Ip & Otchere (2006) argue that the acquirers of cross-border acquisitions can inject advanced technologies, managerial skills and capital to the targets, especially when the acquirers are from developed countries. In these cases, targets of cross-border deals perform better. However, Kang & Kim (2008) find that the targets of geographically proximate

acquisitions earn higher abnormal returns and perform better in post-deal period. We can reasonably infer that well-performing targets after M&As will have influences on surviving rivals. Whether domestic or cross-border deals generate larger intra-industry impacts remains unclear.

Stock market development

Country-level economy development could also have some impacts on corporate finance. We use the logarithm of Gross Domestic Product (LogGDP) to proxy for the development of stock market in each country and expect a positive relationship.

4. Data

The data of mergers and acquisitions are collected from the Security Data Corporation Platinum Edition (SDC) for a period from Jan 1, 1990 to 32 Dec, 2009. We impose the following requirements on the acquisition sample:

1. Both the acquirer and the target must be publicly listed.
2. The status of the acquisition must be 'Completed' in SDC (transactions of other status i.e. 'Rumoured', 'Pending' and 'Withdrawn' are excluded).
3. The change of equity ownership by the acquirer in the target must be no more than 20% before the transaction to no less than 50% afterwards.

Any duplicate transactions and any transactions that did not have at least one rival (the selection criteria of rivals are discussed below) are deleted. To facilitate industry classification and accounting data collection, we also require the target and the acquirer to have valid SIC code and Datastream code. Finally our sample includes 8006 transactions across 46 countries/markets.

Table 1 reports summary statistics of our M&As sample. Panel A presents the year distribution and Panel B presents the country/market distribution. From Panel A we can see that the number of M&As varies tremendously throughout the sample period. In the 1990s, the number of M&As quickly grew five folds from merely 154 in 1990 to the highest peek at 742 in 1999. However, the takeover market immediately cooled down in early years of 21st century and the count of deals in 2002 fell to almost half of that in 1999. During the last several years of our sample period, the takeover market was relatively stable except in 2008 & 2009. In 2009, the number of M&As tumbled to 224 which was less than 1/3 of that in 1999 and even lower than the level of 1994. From Panel B, we notice the imbalance among different counties/markets. The most active M&As market is the U.S. which accounts for4789 deals (60% of the whole sample), followed by Canada with 770 deals (9.62%) and U.K. with 651 deals (8.13%). Although our sample does not contain all M&As in the last two decades, it somehow reflects the reality during the period.

Table 1 Distribution of M&As sample
Panel A By year

Year	No. of Deals	Percentage of deals (%)
1990	154	1.92%
1991	152	1.90%
1992	139	1.74%
1993	152	1.90%
1994	269	3.36%
1995	329	4.11%
1996	406	5.07%
1997	556	6.94%
1998	667	8.33%
1999	742	9.27%
2000	664	8.29%
2001	515	6.43%
2002	364	4.55%
2003	384	4.80%
2004	411	5.13%
2005	460	5.75%
2006	504	6.30%
2007	515	6.43%
2008	399	4.98%
2009	224	2.80%
TOTAL	8006	100.00%
MIN	139	
MAX	742	
MEAN	400.3	
MEDIAN	402.5	
STD DEV	182.05	

Table 1 Distribution of M&As sample
Panel B By country/market

Country	No. of Deals	Percentage of Deals (%)
Argentina	3	0.04%
Australia	393	4.91%
Austria	5	0.06%
Belgium	13	0.16%
Brazil	24	0.30%
Canada	770	9.62%
Chile	3	0.04%
China	13	0.16%
Colombia	1	0.01%
Czech Republic	4	0.05%
Denmark	14	0.17%
Egypt	1	0.01%
Finland	4	0.05%
France	173	2.16%
Germany	127	1.59%
Greece	23	0.29%
Hong Kong SAR	49	0.61%
Hungary	2	0.02%
India	69	0.86%
Indonesia	8	0.10%
Ireland	2	0.02%
Israel	22	0.27%
Italy	38	0.47%
Japan	330	4.12%
Korea, Rep	37	0.46%
Malaysia	22	0.27%
Mexico	4	0.05%
Netherlands	48	0.60%
New Zealand	7	0.09%
Norway	40	0.50%
Pakistan	1	0.01%
Peru	3	0.04%
Philippines	14	0.17%
Poland	10	0.12%
Russian Federation	1	0.01%
Singapore	36	0.45%
South Africa	64	0.80%
Spain	32	0.40%
Sweden	82	1.02%
Switzerland	27	0.34%
Taiwan, China	19	0.24%
Thailand	22	0.27%
Turkey	5	0.06%
United Kingdom	651	8.13%

Table 1 Panel B continued

Country	No. of Deals	Percentage of Deals (%)
United States	4789	59.82%
Venezuela	1	0.01%
TOTAL	8006	100.00%
MIN	1	
MAX	4789	
MEAN	174.04	
MEDIAN	20.5	
STD DEV	713.35	

A sample of rival companies is compiled for each of the 8006 transactions. Our rival sample is constructed based on equity information provided by Datastream. To be identified as a rival, the company must (1) be identified by Datastream in the same country/market of the target firm, (2) have the same two-digit SIC code as the target firm, (3) be publicly listed at the time of transaction and (4) have stock price information available for at least 200 trading days (out of the [-250, +2] trading day estimation period). The targets and the acquirers are excluded from the rival sample. One difficulty in using Datastream to identify rival companies is that Datastream identifies securities rather than companies entities, in that a company may issue multiple classes/levels of securities. Therefore the raw records overstate the number of firms. To solve the problem, we use the QTEALL tag in Datastream to filter out equities without primary listing and major security flags. The remaining equities are regarded as unique representatives of company entities. One advantage of using this approach is that dual-listing or multiple-listing problem can be solved because each company is treated as listing on a single stock exchange[6]. A total of 2694307 rivals remain valid in the final sample. The exact composition of the rival firms varies from deal to deal. On average, each deal is associated with 332 rival firms; however, the number of rivals per deal varies dramatically from 1 rival per deal to 1560 rivals per deal.

The adjusted daily stock prices and all other firm-level accounting data are from Datastream. Two-digit SIC codes for the rival companies are from Worldscope database. Due to the existence of inaccurate or incorrect accounting data, some abnormal accounting values occur in Datastream. For instance in our sample, the price-to-earnings ratio can be as high as several hundreds. We thereby winsorize raw variables when necessary (detailed are provided in Appendix A).

The main market indices of sample countries/markets are corresponding Datastream Global Indices. The original Datastream Global Indices does not distinguish trading and non-trading days because Datastream fills the index value of a non-trading day with the index value of the last trading day. Through communication with Datastream, they provide additional information called “Datastream VACS” which carries a flag indicating trading and non-trading

[6] The stock exchange on which a company is listed does not necessarily reside within the country of that rival company, e.g. in our sample many Australian mining companies’ primary listing exchanges are in the U.S., Canada and Germany. Approximately 9% of the rivals in our sample are listed on foreign exchanges. Under such circumstances, to run equation (1) in the next section, market indices and interest rates are from the countries of the exchanges not of the rivals.

days in most markets covered by Datastream Global Indices. We provide a list of Datastream VACS codes in Appendix B. Combining Datastream Global Indices and VACS, non-trading day market indices can be deleted.

Ince & Porter (2006) and Lee (2011) notice that naïve use of Datastream raw stock price would cause errors since some returns calculated from incorrect raw stock price yield abnormal numbers. They find some stock may suddenly experience extremely high returns compared to its ordinary returns, and these extreme returns were reversed quickly in the following trading days. By comparing raw records of the same company on the same days in other databases, they concluded that these extreme values were due to incorrect or missing data. Indeed in our sample, the daily stock returns of some firms can exceed 700%. Although there is no perfect way to solve this problem, we follow the method used by Ince & Porter (2006) and Lee (2011). But we loosen our constrains and set the daily returns for both days t and t-1 to missing if $(1 + \mathrm{R}_{t-1})(1 + \mathrm{R}_t) - 1 \leq 0.5$, where R_t is the daily return for day t based on raw stock prices and at least one of the daily returns is 200% or greater. We also conduct all regressions using unadjusted returns, and generate statistically similar results (for space consideration these results are not reported). Therefore this data issue does not cause serious problems in our study.

The main interest rates used in this thesis is the rate of 3-month Treasury bill of each country. When information of 3-month Treasury bill is unavailable, equivalent interest rates such as interbank/relending/deposit rates with same maturity length are then used. Most of the markets in our sample have appropriate interest rate. In rare cases when there are no interest rates with equivalent maturity length, we make our best efforts to select the most suitable rates covering the necessary period. The main exchange rates used to convert firm-level accounting data from other currencies to U.S. dollar are WM/Reuters Closing Spot Rates. When WM/Reuters Closing Spot Rates are not available, Thomson Reuters Spot Rates or MSCI Exchange Rates are used as substitutions. These three exchanges rate are downloadable from Datastream.

Macro corporate governance and control variables have been outlined in Section 3. For more details of definition, calculation and source of information please refer to Appendix A.[7]

[7] The data of dummy variable "No Price Limits" are in Appendix C.

5. Research Design

Our study is conducted through two stages. In the first stage, we calculate the abnormal returns to rivals at acquisition announcements. In the second stage, we and run regressions of abnormal returns on different sets of macro corporate governance variables.

To calculate abnormal returns to rivals over the event window, we follow the methodology used by Chan & Otchere (2003) and Chen, Li & Moshirian (2005). Although their model is used in a context of bank privatization, it is applicable in the study of M&As as well. Furthermore, their model is based on multi-equation Seemingly Unrelated Regression (SUR) approach, whereas in this thesis SUR approach is mathematically simplified to an equation-by-equation Ordinary Least Square (OLS) approach because independent variables in each regression model are the same. [8] Therefore, the model to measure abnormal returns becomes:

$$R_{\mathrm{it}} = \alpha + \beta_1 R_{mt-1} + \beta_2 R_{mt} + \beta_3 R_{mt+1} + \tau I_t^U + \gamma D_t + \varepsilon_t \qquad (1)$$

Where:

R_{it} the daily return of rival i on day t

R_{mt} the daily return of the market index on day t

I_t^U the unexpected change in interest rates orthorgonalised with respect to the return of the market index

D_t a dummy variable that equals 1 during the event period ([-2,+2] around the announcement day) and 0 otherwise. The dummy coefficient, γ, captures the abnormal returns to rival firms

Equation (1) consists of a control portion represented by $\alpha + \beta_1 R_{mt-1} + \beta_2 R_{mt} + \beta_3 R_{mt+1} + \tau I_t^U$. The first variable R_{mt} controls for general stock market movements, and both lead and lag terms are included to correct non-synchronous

[8] For mathematic simplifications please refer to Amemiya (1985), p.197.

trading, particularly for smaller rival firms. The second control variable (I_t^U) rectifies impacts caused by unexpected changes in interest rate because Yourougou (1990) document the significance of unexpected changes in interest rate in determining returns to financial institutions. Therefore, following Chan & Otchere (2003) and Chen, Li & Moshirian (2005) we also incorporate I_t^U in regressions because our rival sample contains financial institutions. In addition, it is reasonable to believe that unexpected interest rate movements can affect returns to other types of rivals. We calculate the daily percentage change in interest rate (I_t) as $I_t = \ln(\frac{IR_t}{IR_{t-1}})$, where IR_t is the interest rate in a particular country on day t as selected in section 4. The residuals, denoted by I_t^U, from the regression of I_t on R_{mt} are then used as a control variable in equation(1).

Coefficient γ of the event dummy D_t captures the abnormal return to each rival over the event window. The abnormal return is thereby quantified by the value of coefficient γ if it is significantly different from zero (at 10% level of significance) based on Student-t test. Price sensitivity of rivals is represented by the values of abnormal returns (γ). A higher value of abnormal return means higher price sensitivity of a rival.

Our model estimating abnormal returns is in fact very similar to the market model used by conventional event studies. One difference is that the abnormal returns are residuals in the market model, whereas our model measures abnormal returns as the coefficients of the event dummy. Moreover, our model incorporates additional lead and lag market returns as well as unexpected changes in interest rates to improve the precision of estimation.

To allow possible leakage of announcement information and certain speculations (as opposed to a shorter window), we define a five-day event window from day -2 to day +2 and the announcement day is set at day 0. Longer event window is not suitable as the noises of trading make it difficult to obtain significant results. The period of running regression is from day -250 to day +2. Equation (1) is run separately for every individual rival firm.

In the second stage, we run regressions of abnormal returns (γ) on control and explanatory variables outlined in Section 3. Another thing needs a clarification is that when choosing firm-level financial variables, we use lagged values of the year immediately before the year of announcement. For example, if an acquisition announcement was made in 2008,

we use 2007 accounting variables of related rivals. It is more reasonable to use lagged values to explain M&As in the future, as most accounting figures are prepared at the end of each year. Acquisitions in the middle of the year will affect the operations and ultimately the accounting figures of rivals. In all regressions, year dummies are also controlled for any heterogeneity problems.

6. Empirical Results and Discussions

6.1 Abnormal Returns to Rivals

In this section, we have a quick look at the abnormal returns to the rivals. Table 2 reports summary statistics of abnormal return to rivals estimated by equation(1). We can see from Panel A that out of the total 8006 deals, 7109 deals (about 88.8%) have at least one rivals experiencing abnormal returns over the event window, whereas the remaining 897 deals (about 11.2%) do not exhibit significant impacts on the share prices of rivals. In Panel B, we find that for each deal, averagely 18.83 rivals (or 8.41% of associated rivals) earn noticeable abnormal returns. In line with prior studies, our results highlight that only a part of rivals earn abnormal returns over the event window. We also find that relatively more rivals earn positive abnormal returns, because averagely 11.18 (or 5.05%) rivals earn positive returns per deal, whereas 7.66 (or 3.36%) rivals earning negative abnormal. If we calculate the percentages based on the total number of rivals earning abnormal returns, 59.94% earn positive while 40.06% earn negative abnormal returns at the announcements. In Panel C, the average abnormal return to rivals is +1.36%. A t-statistic based on a null hypothesis of zero mean is 31.26 (unreported in the table). Therefore, the average abnormal return is significantly higher than 0. Our results are generally consistent with previous studies (e.g. Eckbo, 1983; Eckbo & Wier, 1985; Song & Walkling, 2005).

Table 2 Summary statistics of abnormal returns

Panel A

	Count	Percentage
Deals with at least 1 rival experiencing abnormal return	7109	88.80%
Deals without any rival experiencing abnormal return	897	11.20%
Total No. of deals	8006	100%

Panel B

	Count				Percentage			
For each target	**MEAN**	**MEDIAN**	**MIN**	**MAX**	**MEAN**	**MEDIAN**	**MIN**	**MAX**
Rival with abnormal return	18.83	9	0	350	8.41%	6.67%	0.00%	100.00%
Rival with positive (+) abnormal return	11.18	5	0	300	5.05%	3.61%	0.00%	100.00%
Rival with negative (-) abnormal return	7.66	3	0	178	3.36%	2.07%	0.00%	100.00%
out of rivals with abnormal returns								
Rival with positive (+) abnormal return					59.94%	62.50%	0.00%	100.00%
Rival with negative (-) abnormal return					40.06%	37.50%	0.00%	100.00%

Panel C

	MEAN	MEDIAN	MIN	MAX
Average abnormal return to rivals with abnormal returns	1.36%	1.17%	-48.79%	57.13%

6.2 Deal, Firm and Industry Characteristics

In this section, we test baseline models which consist of control variables of deal types, firm-level characteristics, industry structure and stock market development. Table 3 reports the results.

Firm size exhibits a positive relationship with the price sensitivity of rivals. We can see that the coefficient of LogSize is positively significant and the coefficient of Rela_size is positive though insignificant. Additionally, if interpreting large firm size as high information transparency, our results are consistent with Diamond & Verrecchia (1991) and support Hypothesis 3A that high information transparency increases the price sensitivity of rivals.

Another intuition needs to be tested is that rivals whose sizes are similar to the target show higher price sensitivity at M&A announcements, whereas other rivals either much smaller or larger than the target are relatively inert. One rationale is that firms with similar size possess similar financial profiles. Song & Walkling (2000) find that rivals with similar financial profiles are more likely to become targets, and earn bigger abnormal returns at the initial acquisition announcements. Therefore, similar-sized rivals are expected to receive bigger abnormal returns. Another rationale is based on the product market theory. We can categorise firms within an industry to groups according to firm sizes. Firms in one size group in general have close production capacities, so they are likely to produce similar products. In comparison, smaller or larger firms from the bottom or top size groups are likely to produce and sell goods to lower- or upper-end clients. The competition among firms in the same size group is consequently more intensive. When one or more firms are acquired, surviving firms of that group are assumed to be very sensitive to the acquisition. Therefore, we divide rivals into percentiles based on their relative firm sizes against the target. The lowest 10th percentile contains the smallest rivals; rivals in the $40\text{-}60^{th}$ percentiles have the closest size as the targets; largest rivals are in the highest 90th percentile. For each of the three groups, we repeat baseline models. Results in Panel B of Table 3 do not support the above intuition. Only the coefficient of Rela_size in the 90th percentiles is significantly positive.

The coefficients of LogBM in Models 1 and 2 affirm the conjecture that rival firms with low growth prospects are more sensitive to external industry shocks. This result rectifies our hypothesis in the previous section. The coefficients of Dpay achieve expected negative sign, but are insignificant. With regard to leverage (DE), the relationship between leverage and the

price sensitivity of rivals at M&A announcements is negative. Ours findings are largely consistent with that of Palepu (1986), Song & Walkling (1993). Moving on, Turnover is positively related to the price sensitivity as expected. SalesG and ROE are not significant. PE confirms our conjecture that overvalued stocks receive lower abnormal returns. SRVOL exhibits a significantly negative relationship with the price sensitivity of rivals. So we infer that the cash flow uncertainty is one major concern to investors, especially when external events such as mergers and acquisitions occur. Coefficients of Accr are insignificant. Industry concentration measured by Herfindahl index (Helf) exacerbates the reactions of rivals. This result supports our conjecture that firms in highly concentrated industries are closely related with each other, so rivals experience a larger magnitude of price adjustments at M&A announcements. Our results are inconsistent with Song & Walkling (2000), and may be caused by the differences in samples. The sample period in their study is the 1980's and they only include U.S. firm in non-regulated industries. Ours sample covers longer time horizon from 1990-2009 and includes all types of rivals from 46 countries. Deal types also influence the price sensitivity of rivals. The price sensitivity of rivals of vertical deals (Dver) is smaller than that of horizontal deals. Rival firms of conglomerate deals (Dcon) show larger price sensitivity than their counter parties of horizontal deals. These results are consistent with previous expectations. Our results indicate that rivals of cross-border (Dcross) deals are associated with lower abnormal returns. LogGDP is positively correlated with the price sensitivity of rivals as expected.

Table 3 Baseline models: OLS regressions of abnormal returns on control variables

Sample includes all rivals. LogSize is the logarithm of rival's market capitalization. Rela_size is the logarithm of rival's market capitalization over the logarithm of target's market capitalization. LogBM is the logarithm of book-to-market ratio. Dpay is dividend payout ratio. DE is leverage ratio. Turnover is stock turnover ratio. SalesG is the growth rate of sales. ROE is return on equity. PE is price-to-earnings ratio. SRVOL is cash flow uncertainty defined as the standard deviation of monthly stock returns. Accr is the magnitude of accruals. Helf is a sales-based Herfindahl index. Dver is a dummy variable for vertical M&As. Dcon is a dummy variable for conglomerate M&As. Dcross is a dummy variable for cross-border M&As. LogGDP is the logarithm of GDP. *t*-statistics are reported in parentheses. Coefficients denoted with ***, **, * are significant at the 1%, 5%, or 10% level, respectively.

	Panel A		Panel B		
	M1	**M2**	**M3: 10%**	**M4: 40-60%**	**M5: 90%**
Intercept	-0.003**	-0.0031*	-0.014	0.0057	-0.0139***
	(-2.243)	(-1.665)	(-0.622)	(1.282)	(-3.313)
LogSize	0.0000**				
	(2.248)				
Rela_size		0.0002	0.0018	-0.0003	0.0005**
		(1.344)	(0.288)	(-0.118)	(2.358)
LogBM	0.0006***	0.0006***	-0.0000	0.0004***	0.0006***
	(13.611)	(12.229)	(-0.06)	(3.871)	(5.984)
Dpay	-0.0001	0.0000	-0.0001	0.0002	-0.0000
	(-1.222)	(0.251)	(-0.119)	(1.232)	(-0.231)
DE	-0.0001**	-0.0001	-0.0000	0.0001	-0.0002**
	(-2.452)	(-1.628)	(-0.016)	(0.467)	(-2.08)
Turnover	0.0001**	0.0000	-0.0002	0.0003*	-0.0004
	(1.96)	(0.628)	(-1.237)	(1.857)	(-1.459)
SalesG	-0.0000	-0.0000	-0.0000	-0.0000***	0.0000***
	(-0.2)	(-1.089)	(-0.04)	(-3.301)	(3.584)
ROE	-0.0000	-0.0000	-0.0000	-0.0000	0.0000
	(-0.779)	(-1.226)	(-1.217)	(-0.232)	(0.164)
PE	-0.0000***	-0.0000***	0.0000	-0.0000***	-0.0000**
	(-3.657)	(-4.603)	(0.491)	(-2.89)	(-2.368)
SRVOL	-0.0014***	-0.001***	0.0003	-0.0034***	0.0015
	(-4.841)	(-3.027)	(0.194)	(-4.445)	(1.576)
Accr	0.0000	0.0000	-0.0000	-0.0000	0.0000
	(0.085)	(0.308)	(-1.291)	(-0.735)	(0.518)
Helf	0.0011**	0.0023***	-0.0039	0.0029**	0.0038***
	(2.564)	(3.993)	(-0.787)	(2.208)	(3.181)
Dver	-0.0002	-0.0003**	0.0009	0.0002	-0.001***
	(-1.623)	(-2.278)	(0.836)	(0.689)	(-4.027)
Dcon	0.0002***	0.0003***	-0.0001	0.0006***	0.0002
	(2.922)	(3.54)	(-0.157)	(3.386)	(1.492)
Dcross	-0.0002**	-0.0002**	0.0000	-0.0003	0.0006***
	(-2.436)	(-2.46)	(0.026)	(-1.54)	(3.09)
LogGDP	0.0001***	0.0001**	0.0003	-0.0001	0.0005***
	(2.608)	(2.3)	(0.397)	(-0.998)	(3.578)
No. Obs.	454217	317377	11872	61770	50948
Adj.	0.17%	0.21%	0.15%	0.33%	0.41%
Year Dummy	Yes	Yes	Yes	Yes	Yes

6.3 Regression Results: Macro Corporate Governance

In this section, we test the effects of macro governance and legal environments. Different sets of governance variables are incorporated into the baseline model one by one. For the space consideration, we only report relative firm size (Rela_size) in following regressions as it compares relative size between the rivals and the initial targets[9].

Governance and Legal Environments

We test the groups of macro corporate governance indices with regard to Hypothesis 1 and report results in Table 4. In Models 1-6, the coefficients of K1, K3, K4, K5 and K6 are significantly positive. The coefficients of K2 show expected positive signs but are not significant. This group of results indicate that in countries with a stable political and economy situation, with high regulation efficiency, with stronger rule of law and corruption control, rival firm tend to have higher abnormal returns at M&A announcements. In Models 7, 8 and 9, three legal indices (RuleLaw, LawEff and Corruption) yield consistent results with K1 – K6. Results confirm Hypothesis 1 that legal environments exhibit a positive relationship with the price sensitivity of rivals. In addition, the coefficient of WEFEx is significantly positive (Model 10). Our results show that superior quality of exchange regulations facilitates excessive returns earned by rivals. Finally, Model 11 in Table 4 confirms our hypothesis that the price sensitivity of rivals is higher in countries without mandatory daily price limits. Therefore, the first group of results strongly support Hypothesis 1 showing that strong macro corporate governance and legal environments increase the price sensitivity of rivals at M&A announcements.

[9] We also conduct regressions with LogSize, and generate statistically similar results.

Table 4 OLS regressions of abnormal returns on macro governance, legal environments indices and daily price limit dummies

Sample includes all rivals. Rela_size is the logarithm of rival's market capitalization over the logarithm of target's market capitalization. LogBM is the logarithm of book-to-market ratio. Dpay is dividend payout ratio. DE is leverage ratio. Turnover is stock turnover ratio. SalesG is the growth rate of sales. ROE is return on equity. PE is price-to-earnings ratio. SRVOL is cash flow uncertainty defined as the standard deviation of monthly stock returns. Accr is the magnitude of accruals. Helf is a sales-based Herfindahl index. Dver is a dummy variable for vertical M&As. Dcon is a dummy variable for conglomerate M&As. Dcross is a dummy variable for cross-border M&As. LogGDP is the logarithm of GDP. K1 - K6 are 6 governance indices from Kaufmann et al. (2010). K1 is Voice and Accountability. K2 is Political Stability and Absence of Violence/Terrorism. K3 is Government Effectiveness. K4 is Regulatory Quality. K5 is Rule of Law, K6 is Control of Corruption. RuleLaw, LawEff and Corruption are from La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998). RuleLaw is Rule of Law. LawEff is Efficiency of Judicial System. WEFEx is Regulation of Securities Exchanges from the Global Competitiveness Report (2009 – 2010). No Price Limit is a dummy variable indicating whether there is a daily price limit in each country. t -statistics are reported in parentheses. Coefficients denoted with ***, **, * are significant at the 1%, 5%, or 10% level, respectively.

	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11
Intercept	-0.004**	-0.0041*	-0.0058***	-0.0028	-0.0048**	-0.006***	-0.0018	-0.0035*	-0.0053**	-0.0138***	-0.0014
	(-2.134)	(-1.841)	(-2.984)	(-1.519)	(-2.532)	(-3.013)	(-0.959)	(-1.869)	(-2.184)	(-3.206)	(-0.746)
Rela_size	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
	(1.318)	(1.336)	(1.359)	(1.371)	(1.337)	(1.293)	(1.297)	(1.416)	(1.362)	(1.26)	(1.339)
LogBM	0.0006***	0.0006***	0.0006***	0.0006***	0.0006***	0.0006***	0.0006***	0.0006***	0.0006***	0.0006***	0.0006***
	(12.373)	(12.101)	(12.554)	(12.522)	(12.496)	(12.469)	(12.307)	(12.218)	(12.213)	(12.244)	(12.524)
Dpay	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.294)	(0.233)	(0.34)	(0.288)	(0.278)	(0.261)	(0.346)	(0.124)	(0.246)	(0.274)	(0.315)
DE	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001*	-0.0001	-0.0001	-0.0001	-0.0001
	(-1.628)	(-1.625)	(-1.622)	(-1.606)	(-1.614)	(-1.594)	(-1.666)	(-1.593)	(-1.63)	(-1.625)	(-1.641)
Turnover	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.698)	(0.644)	(0.703)	(0.66)	(0.744)	(0.712)	(0.694)	(0.729)	(0.69)	(0.664)	(0.61)
SalesG	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
	(-1.109)	(-1.096)	(-1.112)	(-1.103)	(-1.133)	(-1.109)	(-1.16)	(-1.153)	(-1.072)	(-1.164)	(-1.117)
ROE	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
	(-1.227)	(-1.225)	(-1.224)	(-1.228)	(-1.224)	(-1.226)	(-1.228)	(-1.223)	(-1.224)	(-1.228)	(-1.23)
PE	-0.0000***	-0.0000***	-0.0000***	-0.0000***	-0.0000***	-0.0000***	-0.0000***	-0.0000***	-0.0000***	-0.0000***	-0.0000***
	(-4.515)	(-4.622)	(-4.43)	(-4.414)	(-4.47)	(-4.482)	(-4.514)	(-4.451)	(-4.5)	(-4.619)	(-4.447)

Table 4 continued

	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11
SRVOL	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.0011***	-0.001***	-0.001***	-0.001***	-0.001***	-0.0011***
	(-3.058)	(-3.009)	(-3.103)	(-3.101)	(-3.046)	(-3.134)	(-3.066)	(-2.923)	(-2.99)	(-3.056)	(-3.144)
Accr	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.293)	(0.311)	(0.297)	(0.275)	(0.291)	(0.291)	(0.336)	(0.293)	(0.308)	(0.329)	(0.291)
Helf	0.0022***	0.0024***	0.0022***	0.0022***	0.0021***	0.0022***	0.0021***	0.0022***	0.0023***	0.0021***	0.0022***
	(3.747)	(4.023)	(3.722)	(3.721)	(3.666)	(3.723)	(3.518)	(3.783)	(3.85)	(3.651)	(3.769)
Dver	-0.0003**	-0.0003**	-0.0003**	-0.0003**	-0.0002**	-0.0003**	-0.0003**	-0.0003**	-0.0003**	-0.0003**	-0.0002**
	(-2.146)	(-2.295)	(-2.137)	(-2.17)	(-2.079)	(-2.159)	(-2.209)	(-2.317)	(-2.255)	(-2.24)	(-2.098)
Dcon	0.0003***	0.0003***	0.0003***	0.0003***	0.0003***	0.0003***	0.0003***	0.0003***	0.0003***	0.0003***	0.0003***
	(3.664)	(3.544)	(3.607)	(3.538)	(3.679)	(3.618)	(3.841)	(3.679)	(3.734)	(3.615)	(3.656)
Dcross	-0.0002**	-0.0002**	-0.0002**	-0.0002***	-0.0002***	-0.0002**	-0.0002**	-0.0002**	-0.0002**	-0.0002**	-0.0002***
	(-2.497)	(-2.409)	(-2.532)	(-2.602)	(-2.589)	(-2.485)	(-2.329)	(-2.252)	(-2.352)	(-2.439)	(-2.64)
LogGDP	0.0001**	0.0002**	0.0001**	0.0001	0.0001*	0.0002***	-0.0000	-0.0000	0.0002**	0.0003***	0.0001
	(2.233)	(2.395)	(2.455)	(1.477)	(1.856)	(3.208)	(-0.613)	(-0.075)	(2.522)	(3.59)	(0.946)
K1	0.0008***										
	(3.323)										
K2		0.0002									
		(0.821)									
K3			0.0012***								
			(4.788)								
K4				0.0009***							
				(3.966)							
K5					0.0016***						
					(5.548)						
K6						0.0008***					
						(4.255)					

Table 4 continued

	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11
RuleLaw							0.0004***				
							(4.257)				
LawEff								0.0005***			
								(3.54)			
Corruption									0.0002*		
									(1.645)		
WEFEx										0.001***	
										(2.757)	
No Price Limit											0.0006***
											(3.39)
No. Obs.	317377	317377	317377	317377	317377	317377	317039	317039	317039	317377	317372
Adj. R^2	0.21%	0.21%	0.21%	0.21%	0.22%	0.21%	0.21%	0.21%	0.21%	0.21%	0.21%
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Shareholder Rights

To test Hypothesis 2, we examine shareholder rights indices across different countries. Three versions of anti-director indices, private and public anti-self-dealing enforcement indices and a group of shareholder rights indices from the Global Competitiveness Report are tested.

Table 5 reports regression results with regard to anti-director and anti-self-dealing indices. The original anti-director index (OldAntiDir) from La Porta *et al.* (1998) and the updated anti-director index (PVAntiDir) from Pagano & Volpin (2005) have significantly positive coefficients in Models 1 and 3. The overall effects of these two indices are consistent with Hypothesis 2. One exception is that the coefficient of NewAntiDir is insignificant in Model 2. We consider one possible reason resulting in the insignificance of NewAntiDir is the inconsistency of anti-director indices between different versions. Djankov *et al.* (2008) mentioned some possible flaws of anti-director index such as the ad hoc nature, pitfalls in methodology, the ambiguity in definition and mistakes in coding. Indeed, the scores of many countries in NewAntiDir are very different from the scores in OldAntiDir and PVAntiDir. Most obviously, the score of U.S. in OldAntiDir and PVAntiDir is both 5, whereas it is 3 in NewAntiDir. The new score is even lower than the scores of many developing countries in NewAntiDir. Counties of civil and Scandinavian law origins earn higher scores in NewAntiDir than in previous versions. For instance, scores of German, Belgium and Sweden are 3.5, 3 and 3.5 respectively in NewAntiDir; however, these values are 1, 0 and 3 in older indices. Developing counties also earn inconsistent scores. The scores of Thailand and Indonesia are both 4 in NewAntiDir compared to 2 in older versions. Therefore, our regressions may achieve better results if the construction of anti-director indices becomes consistent.

Public and private anti-self-dealing indices are positively correlated with the abnormal return in Model 6 as expected. As anti-self-dealing is a core aspect of corporate governance, this result strengthens that stronger shareholder protection increases abnormal returns to rivals. We also test the individual impact of private and public enforcement of anti-self-dealing (see Models 4 and 5), and find that private enforcement exhibits a stronger relationship with abnormal returns than public enforcement. Finally in Table 6, we find that the coefficients of shareholder rights indices (WEFEth, WEFBoard, WEFMinor and WEFInv) are positively related to the abnormal returns to rivals. In general, Hypothesis 2 is supported by our empirical results indicating that the price sensitivity of rivals is greater in countries with stronger shareholder rights.

Table 5 OLS regressions of abnormal returns on anti-director and anti-self-dealing indices

Sample includes all rivals. Rela_size is the logarithm of rival's market capitalization over the logarithm of target's market capitalization. LogBM is the logarithm of book-to-market ratio. Dpay is dividend payout ratio. DE is leverage ratio. Turnover is stock turnover ratio. SalesG is the growth rate of sales. ROE is return on equity. PE is price-to-earnings ratio. SRVOL is cash flow uncertainty defined as the standard deviation of monthly stock returns. Accr is the magnitude of accruals. Helf is a sales-based Herfindahl index. Dver is a dummy variable for vertical M&As. Dcon is a dummy variable for conglomerate M&As. Dcross is a dummy variable for cross-border M&As. LogGDP is the logarithm of GDP. OldAntiDir is Anti-director rights from La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998). PVAntidir is Anti-director rights from Pagano and Volpin (2005). NewAntiDir is Anti-director rights from Djankov, La Porta, Lopez-de-Silanes and Shleifer (2008). AntiSelf PrivateEnfor and AntiSelf PubEnfor are Anti-self-dealing index and Public enforcement index from Djankov, La Porta, Lopez-de-Silanes and Shleifer (2008). t-statistics are reported in parentheses. Coefficients denoted with ***, **, * are significant at the 1%, 5%, or 10% level, respectively.

	M1	M2	M3	M4	M5	M6
Intercept	-0.0019	-0.0013	-0.0021	-0.0039**	-0.0047*	-0.0076***
	(-1.033)	(-0.456)	(-1.117)	(-2.057)	(-1.899)	(-2.737)
Rela_size	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
	(1.346)	(1.332)	(1.347)	(1.381)	(1.304)	(1.318)
LogBM	0.0006***	0.0006***	0.0006***	0.0006***	0.0006***	0.0006***
	(12.314)	(12.254)	(12.289)	(12.338)	(12.221)	(12.386)
Dpay	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.269)	(0.301)	(0.251)	(0.215)	(0.294)	(0.287)
DE	-0.0001*	-0.0001	-0.0001*	-0.0001	-0.0001*	-0.0001*
	(-1.674)	(-1.642)	(-1.663)	(-1.617)	(-1.645)	(-1.648)
Turnover	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.657)	(0.617)	(0.652)	(0.625)	(0.638)	(0.643)
SalesG	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
	(-1.091)	(-1.096)	(-1.084)	(-1.101)	(-1.084)	(-1.094)
ROE	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
	(-1.229)	(-1.228)	(-1.227)	(-1.227)	(-1.226)	(-1.228)
PE	-0.0000***	-0.0000***	-0.0000***	-0.0000***	-0.0000***	-0.0000***
	(-4.414)	(-4.605)	(-4.42)	(-4.51)	(-4.625)	(-4.52)
SRVOL	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(-3.031)	(-3.055)	(-3.033)	(-3.036)	(-3.058)	(-3.103)

Table 5 continued

	M1	M2	M3	M4	M5	M6
Accr	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.297)	(0.316)	(0.297)	(0.285)	(0.316)	(0.291)
Helf	0.0024***	0.0023***	0.0023***	0.0023***	0.0023***	0.0024***
	(4.044)	(3.911)	(3.992)	(4.01)	(4.007)	(4.045)
Dver	-0.0003**	-0.0003**	-0.0003**	-0.0003**	-0.0003**	-0.0003**
	(-2.241)	(-2.264)	(-2.229)	(-2.245)	(-2.24)	(-2.154)
Dcon	0.0003***	0.0003***	0.0003***	0.0003***	0.0003***	0.0003***
	(3.761)	(3.558)	(3.766)	(3.519)	(3.593)	(3.622)
Dcross	-0.0002**	-0.0002**	-0.0002**	-0.0002**	-0.0002**	-0.0002**
	(-2.291)	(-2.486)	(-2.32)	(-2.508)	(-2.466)	(-2.543)
LogGDP	0.0001	0.0001	0.0001	0.0001**	0.0002**	0.0003***
	(0.774)	(0.979)	(0.789)	(2.458)	(2.345)	(3.008)
OldAntiDir	0.0003***					
	(2.778)					
NewAntiDir		-0.0001				
		(-0.798)				
PVAntiDir			0.0003**			
			(2.367)			
AntiSelf PrivateEnfor				0.0008*		0.0012**
				(1.776)		(2.344)
AntiSelf PubEnfor					0.0003	0.0005*
					(0.985)	(1.819)
No. Obs.	317039	317377	317039	317377	317377	317377
Adj. R^2	0.21%	0.21%	0.21%	0.21%	0.21%	0.21%
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes

Table 6 OLS regressions of abnormal returns on WEF shareholder rights indices

Sample includes all rivals. Rela_size is the logarithm of rival's market capitalization over the logarithm of target's market capitalization. LogBM is the logarithm of book-to-market ratio. Dpay is dividend payout ratio. DE is leverage ratio. Turnover is stock turnover ratio. SalesG is the growth rate of sales. ROE is return on equity. PE is price-to-earnings ratio. SRVOL is cash flow uncertainty defined as the standard deviation of monthly stock returns. Accr is the magnitude of accruals. Helf is a sales-based Herfindahl index. Dver is a dummy variable for vertical M&As. Dcon is a dummy variable for conglomerate M&As. Dcross is a dummy variable for cross-border M&As. LogGDP is the logarithm of GDP. WEFEth, WEFBoard, WEFMinor and WEFInv are from the Global Competitiveness Report (2009 - 2010). WEFEth is Ethical Behaviour of Firms. WEFBoard is Efficacy of Corporate Boards. WEFMinor is Protection of Minority Shareholders' Interests. WEFInv is Strength of Investor Protection. t -statistics are reported in parentheses. Coefficients denoted with ***, **, * are significant at the 1%, 5%, or 10% level, respectively.

	M1	M2	M3	M4
Intercept	-0.0127***	-0.0114***	-0.0101***	-0.0029
	(-4.46)	(-3.734)	(-3.07)	(-1.584)
Rela_size	0.0002	0.0002	0.0002	0.0002
	(1.328)	(1.227)	(1.275)	(1.411)
LogBM	0.0006***	0.0006***	0.0006***	0.0006***
	(12.443)	(12.28)	(12.302)	(12.391)
Dpay	0.0000	0.0000	0.0000	0.0000
	(0.253)	(0.358)	(0.32)	(0.203)
DE	-0.0001	-0.0001*	-0.0001*	-0.0001
	(-1.612)	(-1.662)	(-1.654)	(-1.59)
Turnover	0.0000	0.0000	0.0000	0.0000
	(0.732)	(0.667)	(0.674)	(0.642)
SalesG	-0.0000	-0.0000	-0.0000	-0.0000
	(-1.127)	(-1.127)	(-1.077)	(-1.139)
ROE	-0.0000	-0.0000	-0.0000	-0.0000
	(-1.225)	(-1.229)	(-1.227)	(-1.226)
PE	-0.0000***	-0.0000***	-0.0000***	-0.0000***
	(-4.543)	(-4.628)	(-4.605)	(-4.47)
SRVOL	-0.001***	-0.001***	-0.001***	-0.001***
	(-3.059)	(-3.112)	(-3.091)	(-3.005)
Accr	0.0000	0.0000	0.0000	0.0000
	(0.293)	(0.329)	(0.312)	(0.282)
Helf	0.0022***	0.0023***	0.0024***	0.0022***
	(3.82)	(3.918)	(4.083)	(3.753)
Dver	-0.0003**	-0.0003**	-0.0003**	-0.0003**
	(-2.13)	(-2.175)	(-2.17)	(-2.246)
Dcon	0.0003***	0.0003***	0.0003***	0.0003***
	(3.674)	(3.741)	(3.688)	(3.458)
Dcross	-0.0002**	-0.0002**	-0.0002**	-0.0002**
	(-2.521)	(-2.412)	(-2.478)	(-2.563)
LogGDP	0.0003***	0.0002***	0.0002***	0.0001
	(4.149)	(3.346)	(3.295)	(1.287)
WEFEth	0.001***			
	(4.451)			

Table 6 continued

	M1	M2	M3	M4
WEFBoard		0.0012***		
		(3.431)		
WEFMinor			0.0009***	
			(2.581)	
WEFInv				0.0002**
				(2.444)
No. Obs.	317377	317377	317377	317377
Adj. R^2	0.22%	0.21%	0.21%	0.21%
Year Dummy	Yes	Yes	Yes	Yes

Information Environment

Hypotheses 3A and 3B are about the information environment of financial markets. The first group of variables proxy tested is the prospectus disclosure index (ProsDisc) and the liability standard index (ProsLia) from La Porta, Lopez-De-Silanes & Shleifer (2006). In Table 7, we can see that both the disclosure and the liability indices exhibit positive relationships with the abnormal returns to rivals. Therefore, the empirical results of prospectus disclosure support Hypothesis 3A instead of 3B, meaning thorough information disclosure and strict liability enforcement enlarge the abnormal returns to rivals.

In addition, the coefficients of accounting and auditing standard indices are all positively significant. The coefficients of AcctStd90 and AcctStd95 highlight that in countries with robust accounting standards, the magnitude of abnormal returns to rivals at M&A announcements are higher. The coefficients of Audit and WEFAudit means that better auditing standards promote the quality of information transparency, which ultimately increase the abnormal returns to rivals at M&A announcements. Our results are in line with Hypothesis 3A instead of 3B, thus indicating higher price sensitivity of rivals in countries with better accounting and auditing standards. Though the coefficient of Analyst achieve expected positive sign, it is statistically insignificant. In Model 8, Media Dev supports Hypothesis 3A that developed media networks facilitate information transparency and enlarge the price sensitivity of rivals.

Table 8 reports the results of media ownerships. Variables representing the ownerships in media exhibit strong relationships with the price sensitivity of rivals. Specifically in Models 1-4, high proportion of state ownerships in newspapers and TV stations reduces the magnitude of abnormal returns to rivals when M&As are announced. On the contrary, Models 5 - 8 highlight that a large private ownership in TV stations increases the abnormal returns to rivals. Our findings are consistent with the arguments that private ownerships in media strengthen information monitoring thus promoting information transparency (Djankov *et al.*, 2003; Houston, Lin & Ma, 2010). To sum up, the results mean that the price sensitivity of rivals in countries with better information transparency is higher.

Table 7 OLS regressions of abnormal returns on indices of information disclosure and liability, accounting and auditing standards, analyst participation and media development

Sample includes all rivals. Rela_size is the logarithm of rival's market capitalization over the logarithm of target's market capitalization. LogBM is the logarithm of book-to-market ratio. Dpay is dividend payout ratio. DE is leverage ratio. Turnover is stock turnover ratio. SalesG is the growth rate of sales. ROE is return on equity. PE is price-to-earnings ratio. SRVOL is cash flow uncertainty defined as the standard deviation of monthly stock returns. Accr is the magnitude of accruals. Helf is a sales-based Herfindahl index. Dver is a dummy variable for vertical M&As. Dcon is a dummy variable for conglomerate M&As. Dcross is a dummy variable for cross-border M&As. LogGDP is the logarithm of GDP. ProsDisc and ProsLia are from La Porta, Lopez-de-Silanes and Shleifer(2006). ProsDisc is Disclosure Requirement Index. ProsLia is Liability Standard Index. AcctStd90 is Accounting Standards from La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998). AcctStd95, Audit, Analyst and Media Dev are CIFAR, AUDIT, NANLYST and MEDIA from Bushman, Robert M., and Joseph D. Piotroski, and Abbie J. Smith (2004). WEFAudit is Strength of Auditing and Reporting Standards from the Global Competitiveness Report (2009 – 2010). *t* -statistics are reported in parentheses. Coefficients denoted with ***, **, * are significant at the 1%, 5%, or 10% level, respectively.

	M1	M2	M3	M4	M5	M6	M7	M8
Intercept	-0.0003	-0.0003	-0.0087***	-0.0075***	-0.0026	-0.0151***	0.0019	-0.0016
	(-0.149)	(-0.14)	(-3.602)	(-3.276)	(-1.341)	(-3.399)	(0.642)	(-0.868)
Rela_size	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
	(1.314)	(1.3)	(1.434)	(1.479)	(1.32)	(1.26)	(1.331)	(1.327)
LogBM	0.0006***	0.0006***	0.0006***	0.0006***	0.0006***	0.0006***	0.0006***	0.0006***
	(12.321)	(12.239)	(12.536)	(12.507)	(12.156)	(12.357)	(12.294)	(12.21)
Dpay	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.389)	(0.353)	(0.234)	(0.177)	(0.151)	(0.319)	(0.276)	(0.211)
DE	-0.0001*	-0.0001*	-0.0001	-0.0001	-0.0001	-0.0001*	-0.0001	-0.0001
	(-1.696)	(-1.697)	(-1.623)	(-1.591)	(-1.594)	(-1.647)	(-1.63)	(-1.606)
Turnover	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.645)	(0.63)	(0.677)	(0.696)	(0.719)	(0.706)	(0.697)	(0.734)
SalesG	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
	(-1.091)	(-1.099)	(-1.112)	(-1.116)	(-1.124)	(-1.104)	(-1.097)	(-1.125)
ROE	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
	(-1.231)	(-1.23)	(-1.227)	(-1.225)	(-1.22)	(-1.228)	(-1.224)	(-1.22)
PE	-0.0000***	-0.0000***	-0.0000***	-0.0000***	-0.0000***	-0.0000***	-0.0000***	-0.0000***
	(-4.428)	(-4.466)	(-4.315)	(-4.313)	(-4.47)	(-4.59)	(-4.402)	(-4.492)

Table 7 continued

	M1	M2	M3	M4	M5	M6	M7	M8
SRVOL	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(-3.075)	(-3.071)	(-3.036)	(-2.967)	(-2.95)	(-3.098)	(-3.006)	(-2.968)
Accr	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.312)	(0.32)	(0.269)	(0.263)	(0.304)	(0.31)	(0.306)	(0.31)
Helf	0.0023***	0.0023***	0.0022***	0.0021***	0.0023***	0.0023***	0.0022***	0.0022***
	(3.981)	(3.972)	(3.725)	(3.637)	(3.867)	(3.951)	(3.781)	(3.793)
Dver	-0.0003**	-0.0003**	-0.0003**	-0.0003**	-0.0002**	-0.0003**	-0.0002**	-0.0002**
	(-2.243)	(-2.254)	(-2.14)	(-2.161)	(-2.051)	(-2.137)	(-1.978)	(-2.028)
Dcon	0.0003***	0.0003***	0.0003***	0.0003***	0.0003***	0.0003***	0.0003***	0.0003***
	(3.779)	(3.823)	(3.718)	(3.628)	(3.651)	(3.689)	(3.647)	(3.662)
Dcross	-0.0002**	-0.0002**	-0.0002**	-0.0002**	-0.0002**	-0.0002**	-0.0002**	-0.0002**
	(-2.336)	(-2.246)	(-2.507)	(-2.518)	(-2.209)	(-2.489)	(-2.397)	(-2.242)
LogGDP	-0.0000	0.0000	0.0002***	0.0001**	0.0001	0.0004***	-0.0001	-0.0001
	(-0.268)	(0.104)	(2.754)	(2.334)	(0.952)	(3.76)	(-0.548)	(-0.891)
ProsDisc	0.0018***							
	(2.728)							
ProsLia		0.001***						
		(2.765)						
AcctStd90			0.0001***					
			(3.887)					
AcctStd95				0.0001***				
				(3.604)				
Audit					0.0004*			
					(1.867)			
WEFAudit						0.0011***		
						(2.976)		

Table 7 continued

	M1	M2	M3	M4	M5	M6	M7	M8
Analyst							0.0000	
							(1.638)	
Media Dev								0.0000***
								(3.514)
No. Obs.	317039	317039	317036	317035	316592	317377	316592	316592
Adj. R^2	0.21%	0.21%	0.21%	0.21%	0.21%	0.21%	0.21%	0.21%
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 8 OLS regressions of abnormal returns on media ownership indices

Sample includes all rivals. Rela_size is the logarithm of rival's market capitalization over the logarithm of target's market capitalization. LogBM is the logarithm of book-to-market ratio. Dpay is dividend payout ratio. DE is leverage ratio. Turnover is stock turnover ratio. SalesG is the growth rate of sales. ROE is return on equity. PE is price-to-earnings ratio. SRVOL is cash flow uncertainty defined as the standard deviation of monthly stock returns. Accr is the magnitude of accruals. Helf is a sales-based Herfindahl index. Dver is a dummy variable for vertical M&As. Dcon is a dummy variable for conglomerate M&As. Dcross is a dummy variable for cross-border M&As. LogGDP is the logarithm of GDP. Press State (Count), Press State (MShare), TV State (Count), TV State (MShare), Press Private (Count), Press Private (MShare), TV Private (Count), TV Private (MShare) are State ownership in press (by count), State ownership in press (by share), State ownership in television (by count), State ownership in television (by share), Private ownership in press (by count), Private ownership in press (by share), Private ownership in television (by count), Private ownership in television (by share) from Djankov et al. (2003). *t* -statistics are reported in parentheses. Coefficients denoted with ***, **, * are significant at the 1%, 5%, or 10% level, respectively.

	M1	M2	M3	M4	M5	M6	M7	M8
Intercept	-0.0031*	-0.0031*	0.0086**	0.0107***	-0.0061***	-0.0062***	0.0087**	0.0085***
	(-1.664)	(-1.663)	(2.274)	(3.366)	(-3.024)	(-3.034)	(2.575)	(2.98)
Rela_size	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
	(1.319)	(1.319)	(1.228)	(1.198)	(1.327)	(1.324)	(1.208)	(1.198)
LogBM	0.0006***	0.0006***	0.0006***	0.0006***	0.0006***	0.0006***	0.0006***	0.0006***
	(12.137)	(12.137)	(12.061)	(12.362)	(12.155)	(12.152)	(12.043)	(12.364)
Dpay	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.258)	(0.258)	(0.391)	(0.465)	(0.235)	(0.239)	(0.419)	(0.472)
DE	-0.0001	-0.0001	-0.0001*	-0.0001*	-0.0001	-0.0001	-0.0001*	-0.0001*
	(-1.623)	(-1.623)	(-1.703)	(-1.724)	(-1.622)	(-1.622)	(-1.721)	(-1.726)
Turnover	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.649)	(0.649)	(0.578)	(0.556)	(0.651)	(0.651)	(0.591)	(0.561)
SalesG	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
	(-1.095)	(-1.095)	(-1.153)	(-1.237)	(-1.098)	(-1.097)	(-1.169)	(-1.239)
ROE	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
	(-1.225)	(-1.225)	(-1.233)	(-1.238)	(-1.224)	(-1.225)	(-1.234)	(-1.238)
PE	-0.0000***	-0.0000***	-0.0000***	-0.0000***	-0.0000***	-0.0000***	-0.0000***	-0.0000***
	(-4.548)	(-4.547)	(-4.659)	(-4.566)	(-4.542)	(-4.544)	(-4.673)	(-4.566)

Table 8 continued

	M1	M2	M3	M4	M5	M6	M7	M8
SRVOL	-0.001***	-0.001***	-0.001***	-0.0011***	-0.001***	-0.001***	-0.001***	-0.0011***
	(-2.961)	(-2.961)	(-3.047)	(-3.159)	(-2.963)	(-2.964)	(-3.05)	(-3.159)
Accr	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.31)	(0.31)	(0.358)	(0.359)	(0.309)	(0.31)	(0.366)	(0.36)
Helf	0.0023***	0.0023***	0.0023***	0.0021***	0.0023***	0.0023***	0.0023***	0.0021***
	(3.957)	(3.957)	(3.977)	(3.501)	(3.925)	(3.924)	(3.969)	(3.497)
Dver	-0.0003**	-0.0003**	-0.0003**	-0.0003**	-0.0003**	-0.0003**	-0.0003**	-0.0003**
	(-2.268)	(-2.268)	(-2.324)	(-2.156)	(-2.282)	(-2.28)	(-2.315)	(-2.156)
Dcon	0.0003***	0.0003***	0.0003***	0.0003***	0.0003***	0.0003***	0.0003***	0.0003***
	(3.616)	(3.616)	(3.686)	(3.784)	(3.61)	(3.613)	(3.715)	(3.784)
Dcross	-0.0002**	-0.0002**	-0.0002**	-0.0002**	-0.0002**	-0.0002**	-0.0002**	-0.0002**
	(-2.431)	(-2.431)	(-2.279)	(-2.397)	(-2.432)	(-2.43)	(-2.244)	(-2.397)
LogGDP	0.0001**	0.0001**	-0.0003**	-0.0003***	0.0001**	0.0001**	-0.0003***	-0.0003***
	(2.288)	(2.287)	(-2.063)	(-3.14)	(2.049)	(2.07)	(-2.678)	(-3.181)
Press State (Count)	-0.0035***							
	(-3.38)							
Press State (MShare)		-0.0035***						
		(-3.383)						
TV State (Count)			-0.002***					
			(-3.662)					
TV State (MShare)				-0.0023***				
				(-5.494)				
Press Private (Count)					0.0034***			
					(3.507)			
Press Private (MShare)						0.0034***		
						(3.463)		

Table 8 continued

	M1	M2	M3	M4	M5	M6	M7	M8
TV Private (Count)							0.0024***	
							(4.289)	
TV Private (MShare)								0.0023***
								(5.536)
No. Obs.	317215	317215	317215	317215	317215	317215	317215	317215
Adj. R^2	0.21%	0.21%	0.21%	0.22%	0.21%	0.21%	0.22%	0.22%
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Creditor Rights and Legal Origins

In Table 9, the coefficient of Creditor Rights is significantly negative (see Model 1). The Coefficient of New Creditor Rights is insignificantly negative. The overall negative relationship between creditor rights and abnormal returns means that stronger creditor rights would reduce the abnormal returns to rivals. Our conjecture in Hypothesis 4 is supported by these results. One possible reason to the negative relationship is that creditors share excessive returns with shareholders. Another possibility is that strong creditors may impose restrictive terms in lending contracts to reduce rivals' propensity of taking on risky projects. Therefore, market investors lower their expectation on rival's future returns then bid lower prices when external events happen.

Model 3 in Table 9 highlight that the price sensitivity of rivals in countries of common law origin is higher than that in countries of civil (French or German civil) or Scandinavian law origins. This result is consistent with Hypothesis 5 and is supported by the argument that macro corporate governance environments are better in countries with common law systems (La Porta *et al.*, 1998; La Porta, Lopez-De-Silanes & Shleifer, 2006; La Porta, Lopez-de-Silanes & Shleifer, 2008).

Table 9 OLS regressions of abnormal returns on creditor rights indices and legal origin dummy

Sample includes all rivals. Rela_size is the logarithm of rival's market capitalization over the logarithm of target's market capitalization. LogBM is the logarithm of book-to-market ratio. Dpay is dividend payout ratio. DE is leverage ratio. Turnover is stock turnover ratio. SalesG is the growth rate of sales. ROE is return on equity. PE is price-to-earnings ratio. SRVOL is cash flow uncertainty defined as the standard deviation of monthly stock returns. Accr is the magnitude of accruals. Helf is a sales-based Herfindahl index. Dver is a dummy variable for vertical M&As. Dcon is a dummy variable for conglomerate M&As. Dcross is a dummy variable for cross-border M&As. LogGDP is the logarithm of GDP. Creditor Rights is Creditor rights from La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998). New Creditor Rights is updated Creditor rights from Djankov, Mcliesh, and Shleifer (2007). Comlaw is a dummy variable for common law country. t-statistics are reported in parentheses. Coefficients denoted with ***, **, * are significant at the 1%, 5%, or 10% level, respectively.

	M1	M2	M3
Intercept	0.0001	-0.0016	-0.0014
	(0.04)	(-0.707)	(-0.744)
Rela_size	0.0002	0.0002	0.0002
	(1.27)	(1.295)	(1.325)
LogBM	0.0006***	0.0006***	0.0006***
	(12.158)	(12.206)	(12.542)
Dpay	0.0000	0.0000	0.0000
	(0.371)	(0.328)	(0.344)
DE	-0.0001*	-0.0001*	-0.0001*
	(-1.684)	(-1.661)	(-1.668)
Turnover	0.0000	0.0000	0.0000
	(0.649)	(0.623)	(0.614)
SalesG	-0.0000	-0.0000	-0.0000
	(-1.126)	(-1.084)	(-1.124)
ROE	-0.0000	-0.0000	-0.0000
	(-1.229)	(-1.228)	(-1.232)
PE	-0.0000***	-0.0000***	-0.0000***
	(-4.549)	(-4.64)	(-4.434)
SRVOL	-0.001***	-0.001***	-0.0011***
	(-3.052)	(-3.059)	(-3.143)
Accr	0.0000	0.0000	0.0000
	(0.345)	(0.325)	(0.29)
Helf	0.0021***	0.0024***	0.0023***
	(3.666)	(4.043)	(3.913)
Dver	-0.0003**	-0.0003**	-0.0002**
	(-2.265)	(-2.272)	(-2.115)
Dcon	0.0003***	0.0003***	0.0003***
	(3.79)	(3.585)	(3.652)
Dcross	-0.0002**	-0.0002**	-0.0002***
	(-2.285)	(-2.436)	(-2.59)
LogGDP	0.0000	0.0001	0.0001
	(0.508)	(1.236)	(0.938)
Creditor Rights	-0.0002***		
	(-2.607)		

Table 9 continued

	M1	M2	M3
New Creditor Rights		-0.0001	
		(-1.245)	
Comlaw			0.0006***
			(3.549)
No. Obs.	317039	317377	317377
Adj. R^2	0.21%	0.21%	0.21%
Year Dummy	Yes	Yes	Yes

7. Robust Tests

Excluding the Dominant Sample Country

As highlighted in Table 1, almost 60% of the targets are domiciled in the U.S. Therefore, the majority of rivals are from U.S. One possible problem is that the sample may be driven by the dominant sample country. To examine this issue, we exclude all U.S. rival firms from the sample and repeat all regressions on the reduced rival sample. Most coefficients still maintain the same signs, and very few of them lose significance. So the results of reduced sample are statistically identical as the results of full sample. Empirical results in the above sections are not driven by rivals from the dominant sample country.

Firm-level Corporate Governance

Previous results are based on country-level macro corporate governance and legal environments. We are also interested in investigating the relationship between firm-level corporate governance and the price sensitivity of rivals.

We conduct additional tests on firm-level corporate governance by collecting two sets of indices: Gov41 and GMI indices. Gov41 index is provided by Aggarwal *et al.* (2010). In their dataset, they offer corporate governance scores for over 8800 firms across 23 countries. We use CUSIP to match U.S. and part of Canadian firms with firm-level data from Datastream. SEDOL codes are used to match firms of other countries. CUSIP codes for U.S. and Canadian firms, SEDOL codes for other firms are from Datastream. GMI index is obtained from GovernanceMetrics International. The scope of GMI is relatively smaller as it covers around 3200 firms all over the world. We also use SEDOL codes to match GMI index and other accounting variables. Both Gov41 and GMI indices rate better corporate governance with higher numbers; therefore, we expect positive relationships between the indices and abnormal returns to rivals.

Table 10 reports the results. We can see that as expected that both Gov41 and GMI indices are positively related to abnormal returns to rivals firms. The coefficient of GMI is positive but insignificant. This may be due to its smaller coverage of firms. In summary, the last

two robust tests indicate that rivals with stronger firm-level corporate governance earn higher abnormal return at M&A announcements.

Table 10 OLS regressions of abnormal returns on firm-level corporate governance indices

Sample includes all rivals. Rela_size is the logarithm of rival's market capitalization over the logarithm of target's market capitalization. LogBM is the logarithm of book-to-market ratio. Dpay is dividend payout ratio. DE is leverage ratio. Turnover is stock turnover ratio. SalesG is the growth rate of sales. ROE is return on equity. PE is price-to-earnings ratio. SRVOL is cash flow uncertainty defined as the standard deviation of monthly stock returns. Accr is the magnitude of accruals. Helf is a sales-based Herfindahl index. Dver is a dummy variable for vertical M&As. Dcon is a dummy variable for conglomerate M&As. Dcross is a dummy variable for cross-border M&As. LogGDP is the logarithm of GDP. Gov41 is governance rating of 41 provisions from Aggarwal *et al.* (2010). GMI is governance rating from GovernanceMetrics International. t-statistics are reported in parentheses. Coefficients denoted with ***, **, * are significant at the 1%, 5%, or 10% level, respectively.

	M1	**M2**
Intercept	0.0008	-0.0051
	(0.235)	(-1.364)
Rela_size	-0.0001	-0.0003*
	(-0.547)	(-1.809)
LogBM	0.0007***	0.0004***
	(12.511)	(6.269)
Dpay	-0.0001	0.0001
	(-0.57)	(0.976)
DE	-0.0001	-0.0001**
	(-1.521)	(-2.063)
Turnover	0.0006***	0.0000
	(3.857)	(0.107)
SalesG	-0.0000	0.0000
	(-1.431)	(1.176)
ROE	-0.0000	-0.0000*
	(-0.288)	(-1.659)
PE	-0.0000	-0.0000***
	(-1.233)	(-3.746)
SRVOL	-0.003***	0.0003
	(-6.283)	(0.319)
Accr	-0.0000	-0.0000
	(-1.133)	(-0.258)
Helf	0.0018**	0.0018**
	(2.348)	(2.421)
Dver	-0.0003**	-0.0001
	(-2.015)	(-0.653)
Dcon	0.0003***	0.0004***
	(3.18)	(4.064)
Dcross	-0.0001	-0.0003***
	(-1.037)	(-2.6)
LogGDP	0.0000	0.0002**
	(0.018)	(1.975)
Gov41	0.0017***	
	(4.201)	
GMI		0.0000
		(1.104)
No. Obs.	211749	106674
Adj. R^2	0.24%	0.23%
Year Dummy	Yes	Yes

8. Conclusion

In this thesis, we examine the influences of macro corporate governance and legal environments on the abnormal return (named as price sensitivity in this thesis) to rivals at acquisition announcements. Although prior literature has related the intra-industry impacts of M&As to a number of influencing factors such as deal types, firm-level characteristics and industry structure, few studies have considered country-level corporate governance and legal environments as potential determinants of the abnormal returns to rivals.

We compile a comprehensive M&A sample and related rivals across 46 countries spanning 1990 to 2009. Consistent with prior literature (Eckbo, 1983; Song & Walkling, 2000), our results confirm that only a part of rivals earn significant abnormal returns over a 5-day event window. On average, rivals are more likely to earn positive instead of negative abnormal returns when M&As are announced.

Our empirical results indicate that the price sensitivity of rivals is higher in well-governed countries. Healthy governance environments prohibit illegal behaviours e.g. informed trading, thus protecting the degree of surprise associated with the announcements. Therefore, the impacts of an acquisition on rivals are prominent when the deal is officially announced. We also find that the price sensitivity of rivals is higher in countries without daily price limits. In Addition, the price sensitivity of rivals at M&A announcements is higher in countries with better shareholder protection. This result can be attributed to the propensity for risk-taking, low agency conflicts and lack of anti-takeover provisions. However, strong creditor rights reversely exhibit a negative relationship with the price sensitivity of rivals. Benefits sharing between shareholders and creditors and low risk-taking willingness are possible reasons. Information transparency is positively related to the price sensitivity of rivals. High transparency guarantees the timeliness, credibility and availability of financial information. Therefore, investors are likely to achieve homogeneous investment strategies which further intensify the price movements at acquisition announcements. Private ownership in media enhances the monitoring functionality of media firms which in turn improves the degree of transparency. Finally, we also observe higher price sensitivity of rivals in countries of English common law origin than in country of civil or Scandinavian law origin. The empirical results of this thesis are valid after controlling for other deal, firm and industry characteristics.

In robust test, we exclude U.S. firms from the rival sample to repeat regressions and achieve similar results. It means that our findings are not driven by the dominant sample country. In tests on firm-level corporate governance, we document positive relationships between the price sensitivity of rivals and firm-level corporate governance measured by Gov41 and GMI ratings. These results are consistent with the results of macro corporate governance, and exhibit that firm-level corporate governance is also positively correlated with the abnormal returns to rivals at M&A announcements.

Appendix A: Variable Definitions and Sources of Information

VARIABLE	ACRONYM	DESCRIPTION & SOURCE OF INFORMATION	
Control Variables		*(Assume corresponding M&A is announced in year t)*	
Firm Size	LogSize	Logarithm of rival's market capitalization denominated in US$ at the end of year t-1.	Datastream (W08001)
Relative Firm Size	Rela_size	Logarithm of rival's market capitalization over logarithm of the target's market capitalization.	Datastream (W08001)
Book-to-Market Ratio	LogBM	Logarithm of book-to-market equity ratio at the end of year t-1. Data Winsorized at the 2nd and 98th percentile.	Datastream (W08001, WC03995)
Dividend Payout Ratio	Dpay	Dividend per share divided by net income per share at the end of year t-1. Data winsorized at the 98th percentile.	Datastream (W05101, WC01706, W05301)
Leverage	DE	Ratio of Long-term debt to common equity at the end of year t-1. Data winsorized at the 2nd and 98th percentile.	Datastream (WC03251, WC03501)
Stock Turnover	Turnover	Average monthly trading volume divided by the number of common shares outstanding in year t-1.	Datastream (VO, W05301)
Firm Growth	SalesG	Average growth rate of annual net sales over the year t-2 and t-1.	Datastream (WC01001)
Return on Equity	ROE	Return on equity in year t-1.	Datastream (ROE)
Price-to-Earnings Ratio	PE	Ratio of stock price to net income at the end of year t-1. Data winsorized at the 5th and 95th percentile.	Datastream (P, WC07106)
Cash flow uncertainty	SRVOL	Standard deviation of monthly stock returns over the year t-2 and t-1. Data winsorized at the 98th percentile.	Datastream (RI)

Appendix A continued

VARIABLE	ACRONYM	DESCRIPTION & SOURCE OF INFORMATION	
Earnings Management	Accr	Magnitude of accruals. It is defined as Accr= |ACC/CF| where ACC= (ΔCA - ΔCASH) – (ΔCL – ΔSD – ΔTP) – DEPN. ΔCA is a change in total current assets; ΔCASH is a change in cash and equivalent; ΔCL is a change in total current liability; ΔSD is a change in short-term debt included in current liabilities; ΔTP is a change in income taxes payable; DEPN is depreciation and amortization expenses; When short-term debt and taxes payable are not available for a firm, then their changes are 0. CF= operating income – ACC. All of the accounting variables are scaled by lagged total assets and measured in year t-1.	Datastream (WC02201, WC02001, WC03101, WC 03051, WC01151, WC03063)
Industry Concentration	Helf	The sales based Herfindahl index is calculated as the summation of the squares of the market shares of all firms (including the target and rivals. Also include the acquirer if M&A is domestic) within an industry in a country, measured in year t - 1.	Datastream (WC01001), Worldscope (SIC)
Vertical Merger	Dver	Deal type dummy. Equals 1 if the target and the acquirer have the same first digit but different second digit of SIC code.	Worldscope (SIC)
Horizontal Merger	Dhor	Deal type dummy. Equals 1 if the target and the acquirer have the same 2-digit SIC code.	As above.
Conglomerate Merger	Dcon	Deal type dummy. Equals 1 if the target and the acquirer have completely different SIC codes.	As above.
Cross-border Merger	Dcross	Deal type dummy. Equals 1 if the target and acquirer are form different countries (markets).	SDC Platinum

Appendix A continued

VARIABLE	ACRONYM	DESCRIPTION & SOURCE OF INFORMATION	
Logarithm of Gross Domestic Production	LogGDP	Log of annual GDP in year t.	World Development Indicators (WDI)- World Bank Database. Taiwan data was collected from the Taiwan National Statistics website.
Explanatory Variables			
Macro Governance and Regulation			
Voice and Accountability	K1	Capturing perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. Definition from Kaufmann et al. (2009).	Aggregate Governance Indicators 1996-2009 (Kaufmann et al. 2010). The values for the years before 1996 are approximated by value in 1996. The value of any year not reported takes the mean value of the years immediately before and after (for example the value of 1999 uses the average score of 1998 and 2000). The whole dataset is available at http://info.worldbank.org/governance/wgi/index.asp.
Political Stability and Absence of Violence/Terrorism	K2	Capturing perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism. Definition from Kaufmann et al. (2009).	As above
Government Efficiency	K3	Capturing perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Definition from Kaufmann et al. (2009).	As above
Regulatory Quality	K4	Capturing perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Definition from Kaufmann et al. (2009).	As above

Appendix A continued

VARIABLE	ACRONYM	DESCRIPTION & SOURCE OF INFORMATION	
Rule of Law	K5	Capturing perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Definition from Kaufmann et al. (2009).	As above
Control of Corruption	K6	Capturing perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. Definition from Kaufmann et al. (2009).	As above
Regulation of Securities Exchanges	WEFEx	Measures the regulation efficiency of securities exchanges. Ranges from 1 (ineffective) to 7 (effective).	World Economy Forum (WEF) the Global Competitiveness Report 2009-2010. Pillar 8 item 8.08.
Efficiency of Judicial System	LawEff	Measures the efficiency of judicial system in a country. Ranges from 0 (lowest efficiency) to 10 (highest efficiency).	La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998)
Rule of Law	RuleLaw	Measures law and order tradition in a country. Ranges from 0 (lowest law and order tradition) to 10 (highest law and order tradition).	As above
Corruption	Corruption	Measures the level of corruption in government. Ranges from 0 (highest level of corruption) to 10 (lowest level of corruption).	As above

Appendix A continued

VARIABLE	ACRONYM	DESCRIPTION & SOURCE OF INFORMATION	
Daily Limit on Share Prices	No Price Limit	Daily price limit dummy variable. Equals 1 if stock exchanges do not impose daily price limit, 0 otherwise.	Manually collected from web sites of stock exchanges in each sample country Kim (2001) Data for our sample countries is given in Appendix C. We cannot find English version exchange regulations of Chile, Colombia, Czech, Hungary, Indonesia, Peru, Russia, and Venezuela; therefore we are unable to verify specific regulations. We assign N/A to these 8 countries.
ShareholderRights			
Anti-Director Index	OldAntiDir	The original version of anti-director index. Is the summation of 6 dummy variables: 1) proxy by mail allowed, 2) shares not blacked before meeting, 3) cumulative voting or proportional representation, 4) oppressed minorities mechanism, 5) pre-emptive rights to new issues, 6) percentage of share capital to call for an extraordinary shareholders' meeting. Ranges from 0 (weak minority shareholder protection) to 6 (strong minority shareholder protection).	La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998)
	NewAntiDir	Updated anti-director indices constructed by Djankov et al.	Djankov, La Porta, Lopez-de-Silanes and Shleifer (2008)
	PVAntiDir	Updated anti-director indices constructed by Pagano and Volpin.	Pagano and Volpin (2005). For each country, take the average value over the years 1993-2002
Anti-Self-Dealing	AntiSelf PrivateEnfor	Average of ex ante and ex post private control of self-dealing. Higher value means stronger anti-self-dealing practices.	Djankov, La Porta, Lopez-de-Silanes and Shleifer (2008)

Appendix A continued

VARIABLE	ACRONYM	DESCRIPTION & SOURCE OF INFORMATION	
	AntiSelf PubEnfor	Aggregate index of public enforcement against self-dealing. Ranges from 0 (weak public enforcement) to 4 (strict public enforcement).	As above
Ethical Behaviour of Firms	WEFEth	Compare the corporate ethics (ethical behaviour in interactions with public officials, politicians, and other enterprises) of firms in one country with those of other countries in the world. Ranges from 1 (among the worst in the world) to 7 (among the best in the world).	World Economy Forum (WEF) the Global Competitiveness Report 2009-2010. Pillar 1 item 1.16.
Efficacy of Corporate Boards	WEFBoard	Measures corporate governance by investors and boards of directors. Ranges from 1 (management has little accountability to investors and boards) to 7 (investors and boards exert strong supervision of management decisions)	World Economy Forum (WEF) the Global Competitiveness Report 2009-2010. Pillar 1 item 1.18.
Protection of Minority Shareholders' Interests	WEFMinor	Measures to what extent are the interests of minority shareholders protected by the legal system. Range from 1 (not protected at all) to 7 (fully protected).	World Economy Forum (WEF) the Global Competitiveness Report 2009-2010. Pillar 1 item 1.19.
Strength of Investor Protection	WEFInv	Measures the strength of investor protection by legal system. Ranges from 1 (worst) to 10 (best).	World Economy Forum (WEF) The Global Competitiveness Report 2009-2010. Pillar 8 item 8.06.
Information Environment			
Disclosure Requirements Index	ProsDisc	Average of 6 variables: prospectus, compensation, shareholders, inside ownership, irregular contracts. Higher values indicate greater information disclosure.	La Porta, Lopez-de-Silanes and Shleifer(2006)
Liability Standard Index	ProsLia	Average of 3 variables: liability standard for the issuer and its directors, liability standard for distributors, liability standard for accountants. Higher values indicate stricter regulation enforcement.	As above

Appendix A continued

VARIABLE	ACRONYM	DESCRIPTION & SOURCE OF INFORMATION	
Accounting Standards	AcctStd90	Index created by examining and rating companies' 1990 annual reports on their inclusion or omission of 90 items.	La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998).
	AcctStd95	Index created by examining and rating companies' 1995 annual reports on their inclusion or omission of 90 items.	Bushman, Robert M., and Joseph D. Piotroski, and Abbie J. Smith (2004)
Auditing Practices	Audit	Percentage of firms in the country audited by the Big 5 accounting firms.	As above
Strength of Auditing and Reporting Standards	WEFAudit	Measures financial auditing and reporting standards regarding company financial performance. Ranges from 1 extremely weak) to 7 (extremely strong).	World Economy Forum (WEF) the Global Competitiveness Report 2009-2010. Pillar 1 item 1.17.
Number of Analysts	Analyst	Number of analysts following the largest 30 companies in each country in 1996.	Bushman, Robert M., and Joseph D. Piotroski, and Abbie J. Smith (2004)
Media Development	Media Dev	Average rank of the countries' media development (print and television) between 1993 and 1995.	As above
Media Ownership	Press State (Count)	Percentage of state-owned newspapers out of the five largest daily newspapers (by circulation).	Djankov et al. (2003).
	Press State (MShare)	Market share of state-owned newspapers out of the aggregate market share of the five largest daily newspapers (by circulation).	As above
	TV State (Count)	Percentage of state-owned television stations out of the five largest television stations (by viewership).	As above
	TV State (MShare)	Market share of state-owned television stations out of the aggregate market share of the five largest television stations (by viewership).	As above

Appendix A continued

VARIABLE	ACRONYM	DESCRIPTION & SOURCE OF INFORMATION	
	Press Private (Count)	Percentage of privately-owned newspapers out of the five largest daily newspapers (by circulation).	As above
	Press Private (MShare)	Market share of privately-owned newspapers out of the aggregate market share of the five largest daily newspapers (by circulation).	As above
	TV Private (Count)	Percentage of privately-owned television stations out of the five largest television stations (by viewership).	As above
	TV Private (MShare)	Market share of privately-owned television stations out of the aggregate market share of the five largest television stations (by viewership).	As above
Creditor Rights			
Creditor Rights	Creditor Rights	Summation of four dummy variables: no automatic stay on assets, priority claims for creditors during bankruptcy, restrictions on reorganisation, and creditors' ability to change incumbent managers during bankruptcy. Ranges from 0 (weak creditor rights) to 4 (strong creditor rights).	La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998)
	New Creditor Rights	Updated creditor rights index.	Djankov, McLiesh and Shleifer (2007)
Legal Origin			
Common Law	ComLaw	Law dummy. Equals 1 if the country of the target has a common law origin, 0 otherwise	Djankov, La Porta, Lopez-de-Silanes and Shleifer (2008).

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VARIABLE	ACRONYM	DESCRIPTION & SOURCE OF INFORMATION	
Firm-level Corporate Governance			
Governance Index	Gov41	Aggregated value of 41 corporate governance provisions. Higher value for better corporate governance.	Aggarwal *et al.* (2010). Take the average value of available years.
	GMI	Corporate governance rating. Higher values for better corporate governance.	GovernanceMetrics International. Take the average value of 2005 and 2006.

Appendix B: Datastream VACS Codes

Country	VACS
Argentina	AG:VAC
Australia	A:VACS
Austria	O:VACS
Belgium	B:VACS
Brazil	BR:VAC
Canada	C:VACS
Chile	CL:VAC
Croatia	CR:VAC
Czech Republic	CZ:VAC
Denmark	DK:VAC
Finland	M:VACS
France	F:VACS
Germany	D:VACS
Greece	G:VACS
Hong Kong SAR	K:VACS
Hungary	HN:VAC
India	IN:VAC
Indonesia	ID:VAC
Israel	IS:VAC
Italy	I:VACS
Japan	J:VACS
Korea, Rep	KO:VAC
Malaysia	L:VACS
Mexico	MX:VAC
Netherlands	H:VACS
New Zealand	Z:VACS
Norway	N:VACS
Pakistan	PK:VAC
Philippines	PH:VAC
Poland	PO:VAC
Portugal	P:VACS
Singapore	T:VACS
Slovak Republic	SK:VAC
South Africa	R:VACS
Spain	E:VACS
Sweden	W:VACS
Switzerland	S:VACS
Taiwan, China	TW:VAC
Thailand	Q:VACS
Turkey	TK:VAC
United Kingdom	VACS
United States	U:VACS

Note: Out of 46 countries our sample, 7 countries do not have corresponding Datastream VACS codes. These countries are China, Colombia, Egypt, Ireland, Peru, Russia and Venezuela.

Appendix C: Original Data of Dummy Variable "No Price Limit".

Country	No Price Limit
Argentina	1
Australia	1
Austria	0
Belgium	0
Brazil	1
Canada	1
Chile	N/A
China	0
Colombia	N/A
Czech Republic	N/A
Denmark	1
Egypt	0
Finland	0
France	0
Germany	1
Greece	0
Hong Kong SAR	1
Hungary	N/A
India	0
Indonesia	N/A
Ireland	1
Israel	0
Italy	0
Japan	0
Korea, Rep	0
Malaysia	0
Mexico	0
Netherlands	0
New Zealand	1
Norway	1
Pakistan	1
Peru	N/A
Philippines	0
Poland	0
Russian Federation	N/A
Singapore	1
South Africa	1
Spain	0
Sweden	1
Switzerland	0
Taiwan, China	0
Thailand	0
Turkey	0
United Kingdom	1
United States	1
Venezuela	N/A

Note: N/A means not valid information for this country can be found.

Appendix D: Correlations between Control Variables

	Adj_response	logSize	Rela_size	logBM	Dpay	DE	Turnover	SalesG	ROE	PE	SRVOL	Accr	Helf	Dver	Dcon	Dcross	logGDP
Adj_response	1																
logSize	-0.014	1															
Rela_size	-0.003	0.66	1														
logBM	0.034	-0.343	-0.189	1													
Dpay	0.000	0.095	0.044	0.143	1												
DE	0.001	0.09	0.046	0.038	0.157	1											
Turnover	-0.001	-0.004	-0.003	-0.008	-0.013	0.02	1										
SalesG	-0.001	-0.02	-0.013	-0.01	-0.007	0.006	0.000	1									
ROE	0.001	0.021	0.02	0.012	0.002	-0.026	0.000	-0.005	1								
PE	-0.001	0.245	0.166	-0.035	0.085	0.01	0.000	-0.015	0.018	1							
SRVOL	-0.011	-0.313	-0.196	-0.225	-0.24	-0.121	0.012	0.034	-0.04	-0.24	1						
Accr	0.000	-0.002	-0.002	0.008	0.003	0.006	0.000	0.000	0.000	-0.01	-0.001	1					
Helf	-0.001	0.014	-0.003	0.03	0.334	0.105	-0.001	0.018	0.007	0.001	-0.058	-0.003	1				
Dver	-0.003	0.022	0.027	0.04	0.053	0.048	-0.003	0.001	0.007	0.032	-0.057	0.002	0.094	1			
Dcon	0.000	-0.032	0.018	-0.103	-0.094	-0.066	0.007	0.002	-0.007	-0.027	0.109	-0.001	-0.027	-0.151	1		
Dcross	-0.005	-0.024	-0.069	-0.089	-0.069	-0.057	0.004	0.006	-0.003	-0.051	0.073	0.002	0.005	0.015	0.093	1	
logGDP	0.001	0.067	0.029	-0.046	-0.067	0.087	0.003	0.000	-0.003	0.06	0.036	0.002	-0.283	0.008	0.021	-0.085	1

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