The University Of Sheffield.

Essays on Roles of Directors in Corporate Governance

By:

Jiao Ji

Registration No.: 130122357

A thesis submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy

The University of Sheffield

Management School

Submission Date 31 August 2016

Table of Contents

List of tables and figure

Acknowledgements

Undertaking this PhD has been a truly life-changing experience for me and it would not have been possible to do without the support and guidance that I received from many people.

I would like to express my special appreciation and thanks to my supervisor Dr Oleksandr Talavera, you have been a tremendous mentor for me. I would like to thank you for encouraging my research and for allowing me to grow as a researcher. I appreciate all his contributions of time and ideas to make my Ph.D. experience productive and stimulating. The joy and enthusiasm he has for his research was contagious and motivational for me, even during tough times in the Ph.D. pursuit.

I would also like to express my gratitude to Dr Shuxing Yin, for her willingness to act as my second supervisor and for her continuous guidance and helpful suggestions throughout my study period. I am also thankful for the excellent example she has provided as a successful female researcher and educator.

A special thanks to my family. Words cannot express how grateful I am to my mother-in law, father-in-law, my mother, and father for all of the sacrifices that you've made on my behalf. I would also like to thank all of my friends who supported me in writing, and incited me to strive towards my goal. At the end I would like express appreciation to my beloved husband Haofeng who spent sleepless nights with and was always my support in the moments when there was no one to answer my queries.

Abstract

Essays on Roles of Directors in Corporate Governance

Jiao Ji

2016

The three chapters in the thesis provide some innovative explanations and perspectives regarding the role of directors, particularly, independent directors in a transaction market – China and in a developed market- UK.

In "CEO Dismissal, Compensation and Topics of Board Meetings: The Case of China", I provide a better understanding of how board activity affects board effectiveness in linking CEO compensation/dismissal to firm performance. There are six major topics discussed in board meetings. Our results show that turnover-performance sensitivity is weaker when there is a higher frequency of board meetings discussing the nomination of directors and top management. Moreover, the link between CEO compensation and firm performance is enhanced only when directors meet more often to discuss growth strategies for the use of IPO proceeds, investment and acquisitions. These sensitivities are not influenced by meeting frequency of other topics. It also sheds lights on how board monitoring of different decisions at board meetings modifies the connection between CEO interests and firm performance, then affect the quality of corporate governance.

In "Auditor Change and Corporate Governance: Audit Committee Reputation", I provide a new empirical evidence that reputation is a strong incentive to independent directors to work diligently. I select audit committee in the UK as the study object because their roles on board

are well-defined and the reputation cost for audit committee member is larger than that for other directors. Firstly, this chapter shows that the probability of auditor change increases with the proportion of reputable members. Second, reputable members tend to switch an auditor which offers a high audit quality, measured by better brand-name, bigger size, and higher independence. This chapter further shows that the reduce discretionary accruals, a proxy for earnings management, only follows an audit change driven/approved by audit committee, rather than involuntary auditor change (market shock).

In "The Hidden Information Content: Evidence from the Tone of Independent Director Reports", I utilise a Naïve Bayesian machine learning algorithm combining with the Chinese word segmentation to inspect the information content (the tone) of independent director report, a unique disclosure of independent director. This chapter firstly examines the determinants of a report tone, firms with younger independent directors, more directors with accounting expertise, more board committees, more board meetings, less leverage, and controlled by private shareholders tend to have more positive IDRs. The chapter further tests whether the tone in the report has predict power to the future performance given that the tone of reports is based on director's overall satisfactions of the firm. The average tone of the IDRs is positively associated with future firm performance after controlling other factors that influence firm performance. Moreover, the negative tone of IDRs is negatively correlated with firm performance for firms with greater monitoring necessities.

Chapter one: Introduction

Interests in corporate governance have grown rapidly in academia and among the business community, the media, regulators, and the general public with financial scandals, financial crisis and news about excessive executive pay. Consequently, much of the recent discussion has focused on how to improve corporate governance systems broadly to avoid similar problems and issues. In the academic world, the interest in corporate governance has been interdisciplinary. Studies are carried out by scholars in Law, Economics, Finance, Accounting, and Management.

The aim of this chapter is to clarify the theoretical framework for corporate governance research in finance. The theoretical framework is the guidance for my thesis and my future research in this areas. It primarily includes two parts: review corporate governance in finance around the world and highlight corporate governance costs that are unique to China. Last, this chapter also summaries findings and contributions of my thesis.

1.1 Corporate Governance across the World

Stock-exchange listed firms exists across the world. In this types of firms, shares are not only the ownership certificates and have voting rights. Shareholders who have voting rights can vote in the annual general shareholders meetings and influence the appointment of board of directors. Board of director is essential and ultimate governance device in the corporations. Particular non-executive directors are principally in charge of monitoring the top management (including executive directors).

1.1.1 *Definitions of Corporate Governance*

There are multiple definitions of corporate governance basically relying on the chosen objective of the company. The objective of a company is influenced by a counties culture, law

and instructional environments. The key question for deciding corporation objective is whose company the corporation is. There are two typical definitions. Based on believes that corporate goal is to maximise the return of shareholders such as in the UK and US, corporate governance is '*the system of controls, regulations, and incentives designed to minimise agency costs between managers and investors and prevent corporate fraud*' (Berk and DeMarzo, 2009). On the other hand, most other countries such France, Germany and Japan have the view that listed firms belong to all stakeholders. The more appropriate definition of corporate governance is *'a system is the combination of mechanisms which ensure that the management runs the firm for the benefit of one or several stakeholders (principles)'*(e.g. Goergen and Rennenoog, 2006). Stakeholders may include all parties that have business relationship with listed firms, for example, shareholders, creditors, suppliers, consumers and employees.

1.1.2 *Corporate Governance Theory in Finance – Agency Theory*

The classical theoretical model of corporate governance is the principal-agent theory (Jensen and Meckling, 1976). When the interest conflicts exists between agents and principals, the agent may not carry out duties agreed with principals in the best interest of principals, and favour to do self-interest activities. It normally refers to moral hazard in economics (Holmstrom, 1979). Complete contract may be a possible approach to mitigate principal and agent issue. However, contracts are impossible to complete due to practice issues (Hart, 1995). These issues contains that impossible predictions about all future contingencies, endless contracting, no efficient reinforce institutions, and more importantly, impossible to entirely monitoring agent' duty due to information asymmetry. Agency costs have three components: monitoring costs by the principal, bonding costs by the agent, and the residual loss due to agent's self-interest behaviour.

1.1.3 *Classical Agency problems and Expropriation of Minority Shareholders*

Based on Berle-Means (1932) premise that as firms grows, corporations will be run by professional managers who have little/ no shares on behalf of the shareholder. There are two classical types of agency problems based on sources of financing. First type of problems is between managers (agents) and shareholders (principals), chiefly perks, free cash flow problem, and management entrenchment. Perks denotes unreasonable on-position-consumptions by managers (e.g. (Yermack, 1996). Free cash flow problem means that managers increase the firm size by investing in negative net present value projects that may harm firm value. Manger's increase firm size merely to increase their own power, social status and managerial compensation that often corresponding to firm size. Managerial entrenchment means that managers shield themselves from hostile takeovers and internal disciplinary actions.

Second type of agency problem is between debt holders and shareholders. This problem incurs when a firm only have very little equity financing, so the shareholders will invest in high-risk project. When the project successes, the massive pay off will go to shareholders; while when the project fails, the massive loss goes to debt holders. The agency costs between debt holder and equity holder decrease with the share of equity holding, while ones between management and equity holder increase with the share of equity holding. Therefore, the total agency costs has is U sharp with a minimum level.

However, only corporations in Anglo-Saxon system have dispersed ownership such as in the US and UK. In most corporation across the world, the firm control lies with one or several shareholders, instead of managers. These shareholders could be families, state, institutional investors, and industrial companies. Therefore, the separation of ownership and control concerns only shareholders. There are two types of shareholders, the controlling shareholders and the minority shareholders. The controlling shareholders have enough control over firm operations by influencing firm decision-making process, while the minority shareholders are

short of power to interfere. Therefore, in these countries, the dominant agency problems is the expropriation of minority shareholders.

There are mainly two forms of expropriations, related party transactions and the fights for controlling position. The related party transactions happened when the controlling shareholders in a firm are the owners or shareholders of other firms in which he/she have more shares. The controlling shareholders could increase her own interests by transferring assets or profits from a firm to the firm where she has a higher stake. It is normally referred to as tunneling (Johnson, La Porta, Lopez-de-Silanes, and Shleifer, 2000). The controlling shareholders also could overcharging a firm by selling the products or serves from the firm where she has a higher stake[1]. Family control shareholders may prefer to choose a family member to manage the firm, rather hiring the candidate on the labour market, referring as nepotism. Occasionally, the fights between controlling shareholder even due to uneconomic reasons (for example, different political view) decrease firm value, referring to infighting.

1.1.4 *Discussions on Ownership and Control*

To deeply understand the complexity of modern corporate governance, the ownership and control has to be more clearly defined. Ownership is the ownership of cash flow rights. Cash flow rights provide shareholders rights to claim their share in firm's earning when a firm is continually going. They also give rights to claim the residuals interests when a firm is liquidated. Control is the ownership of control rights, depending on how many voting rights the shareholders have.

Only in the UK and US, the ownership and control are separated, and main types of shareholders are institutional investors and board members. However, in Eastern Europe, Asia and Continental Western Europe, corporate control is concentrated and lies with one or few

[1] Some researcher give it a name as transfer pricing, others see it as a type of tunneling.

shareholders that are families, holding companies and government. The table below shows the combinations of ownerships and controls.

Table 1. Combinations of Ownership and Control

		Ownership	
		dispersed	Concentrated
Control	Weak	A. UK, US	B. Rare
	Strong	C. common in developed economies	D. common in the rest of world (emerging markets)

1.2 Corporate Governance Issues that are Unique to China

There are two chapters in my thesis studying corporate governance issue in China. Most developed theories and empirical studies are based on developed markets, mainly the US and UK. To do research in emerging markets, researchers have to clarify the uniqueness of each market, and identify which types of agency problems addressed. In this section, I discuss some important governance issues in China.

1.2.1 Ownership Structure

The ownership structure is complex due to historical reasons, and becomes more modernized or westernised recently. I summaries the timeline for regulation changes and their impact on shareholdings in Chinese firms (Table 2). After the Split Share Reform in China, the invertor composition has massively changed. In 2012, individuals hold 25.33% of all tradeable shares; mutual funds, insurance firms and QFIIs accounts for 7.59%, 3.74 and 1.40 respectively; other 27.28% are held by ordinary institutional investors (Jiang and Kim, 2015).

Table 2. Big Events and Their Impact on the Ownership of Listed Firm in China

Timeline	Event	Largest shareholders	Other type of investors
Dec 1990 (July1991)	The Shanghai (first) and Shenzhen Stock Exchanges were launched.	Central, local governments, and legal persons (most are state owned or partially state-owned, some are private owned)	individuals
1998		Non-tradable shares	Tradable shares
1999(2004)			closed-end funds/mutual fund
2003			insurance/funds
2003(2005)			QFII the National Social Fund indirectly (directly)
2005	China Split Share reform. All nontradable shares start to be transformed into tradable shares.	Tradable shares / restricted shares	Tradable shares

However, situation of ownership concentration has not changed. Most firms have state ownership and controlling shareholders. In the Angulo-Saxon markets with dispersed ownership, larger shareholder have means and incentives to monitoring managers, which could mintage the agency problem between manager and shareholders (e.g Shleifer and Vishny, 1997). As we discuss above, however in most countries, a large shareholder could actually control the firms and managers. The controlling shareholders may expropriate wealth from minority shareholders, which is the main agency problem in most countries (e.g. La Porta, Lopez-De-Silanes, & Shleifer, 1999).

In China, listed firms can be divided into two groups based on the ultimate controlling shareholder: State-owned-enterprises (SOEs) or non SOEs. The SOEs has ultimately controlled by government or State-owned-enterprises, accounting for about 65% in all firms. In both SOEs and non SOEs normally have a largest shareholder that own about 30-40% of the listed firm based on the calculations using the China Stock Market & Accounting Research (CSMAR) Database.

The question of whether larger shareholders may monitor the firm or expropriate the interests from minority shareholder is still an open question. The empirical research examines the relationship between larger shareholder ownership and firm performance. Their results are mixed when different accounting or market measures are used or different cutting off proportions are to category largest shareholding (e.g. Bai and Xu, 2005; Chen, Firth, and Xu, 2009). Therefore, these results need to be interpret with cations.

More interestingly, there are many SOEs in China with state agents or SOEs as their largest shareholder. Some empirical results show that the state ownership is negative with firm value (Wei, Xie, and Zhang, 2005). However, most researcher do not claim state engages in tunneling. They argue that state may use SOEs to pursue other objectives (political or society) rather merely profit maximizing, but less likely for private benefit. Some paper find CEOs or other managers in SOEs are involving in tunneling but illicit wealth gain of managers. Therefore, agency problems in SOEs are more likely to be the problem between manager and shareholders.

After 2005, various institutional investors participate the China' capital market. Two necessary conditions are required to institutional investor to play monitoring role: a) they have larger shareholding b) they have long-run horizon (X. Chen, Harford, and Li, 2007). In China, the turnover rate of institution investor is quit high, and shareholding only account for about 4% (Jiang and Kim, 2015). Some studies shows shareholder activism of institutional investor in China, but they may fail to reveal the causality relationship. The channels of how institutional investors engage in corporate governance issues and whether institutional investor achieve their objectives are vague.

1.2.2 Capital Structure and Dividends Policy

The debt holder monitoring and shareholders pressure on dividends are disciplinary mechanisms in developed market, because they can mitigate the agency costs of free cash flow (Jensen, 1986). However, these two functions are weak in China.

Creditor rights are still weak in China. Bankruptcy law in China provides creditors a channel to go force their borrower to endure bankruptcy proceedings and recover any defaulted principal and interests. However, bankruptcies are extremely rare. Some firms are aided by local governments to prevent unemployment and stable society (Allen, Qian, and Qian, 2005) . Second, the majority lenders are not play monitoring role. Chinese banking industry is still concentrated, and four big state controlling banks and around 20 national-level domestic joint-equity banks. These banks have strong incentive to provide loan to larger firms and state-owned firms because larger firms and state-owned firms have the government underwriting or guarantee to pay off (Allen et al., 2005; Berger, Hasan, and Zhou, 2009)

In China, the dividend payoff ratios are low compared. This is because minority shareholder rights are weak in China, so they are incompetent to pressure firms to offer pay-outs. Another explanation is that the Chinese investors are more speculator, who goes after capital gains and concern less about dividends (Morck, Yeung, and Yu, 2000). Therefore, dividend pay-out policy is hardly an effective device to moderate any type of agency costs in China.

1.3 The role of non-executive directors in corporate governance and my research: in a developed market (UK) and an emerging market (China)

My thesis has examined the role of non-executive directors in a developed market (UK) and in an emerging market (China). The board of directors is a universal corporate governance mechanism across the world. They are also in the center of public and media criticism whenever corporate scandals happen. One main task of the board is monitoring corporate or top management misconducts, so corporate scandals make people question about directors' work diligence. How to make the board of director more effective is a key topic in corporate governance. Basically, there are four dominant research theme in of board literature illustrated

in Figure 1 in U.S., U.K. and Western European literature: what directors do, board structure, how directors work, what motives directors (Adams, Hermalin, and Weisbach, 2010).

1.3.1 Agency theory

In the Anglo-Saxon model of corporate governance, board of directors (particularly, non-executive directors) play a central role in monitoring managers on behave of shareholders. Their main tasks are monitoring of what top management does and evaluating managerial ability, then firing underperformed management and selecting the fitting replacement (Jensen and Meckling, 1976). However, the function of board of directors is still under discussion. It has been censured for lack of independence, deficient attention and incentives (Tirole, 2010). Directors rarely have disapproval of top management' decisions in board meetings. Recently more empirical evidence shows that board of directors become more active. More studies are still needed to investigate the dynamics in the boardroom to improve the effectiveness of boards.

Most importantly, board of directors is a governance mechanism of which effectiveness depends on the effectiveness of others[2] (e.g., Demsetz and Lehn, 1985; Fama and Jensen, 1983; Young, Peng, Ahlstrom, Bruton, and Jiang, 2008). For example, if board of director fails to discipline the underperformed top management, a takeover bid is crucial to remove an entrenched management team. It is also suggested that the efficiency of a package of governance mechanisms differs systematically with the institutional structure at the "country" level (La Porta et al., 1997, 1998, 2002). National culture affects the institutional context, ultimately influences the governance mechanisms at the firm level.

[2] Internal mechanisms includes board of directors, ownership structure, executive compensation plans; external mechanisms contains take over market, product market competition, and managerial labour market.

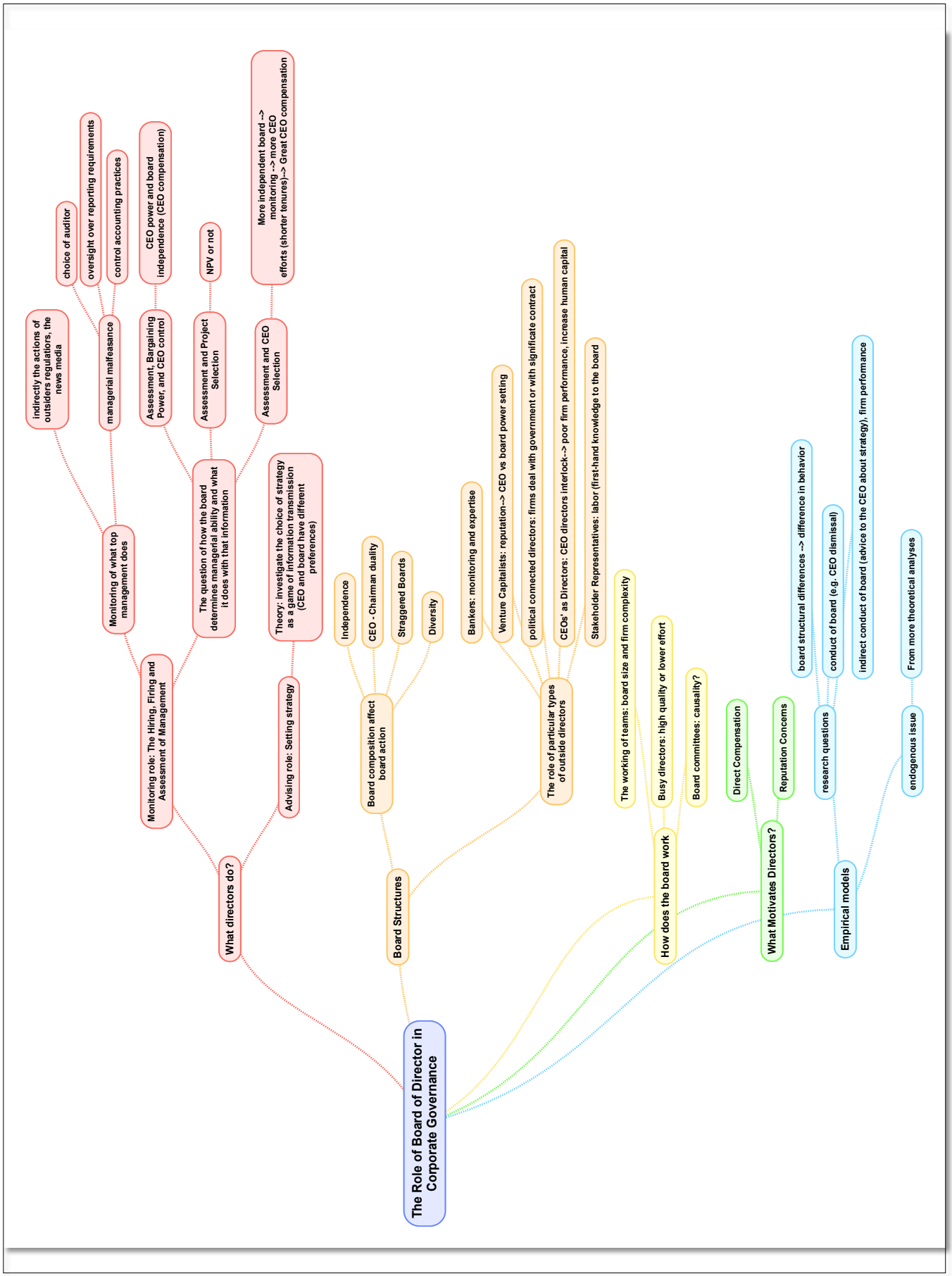

Figure 1 Board of Director Research

1.3.2 Non-executive director reputation concerns: evidence from UK (Chapter 1)

In the first chapter of my thesis, I investigate what factor motives non-executives in competitive labour market (UK market), particularly focus on audit committee members. Literature in corporate governance point out that audit committee (AC) plays a critical role in the improving the quality of financial reporting and ensuring the independence of statutory auditing (Cadbury Committee, 1992; Sarbanes-Oxley Act, 2002). However, how to improve auditor committee's effectiveness is a key issue. Most studies examine how variations of committee structure affect audit committee outcomes (audit choice, audit fee, earning management). They assume that independence of audit committee, composition and the experience/expertise of individual directors could influence audit committee members' behaviour.

Recently, a few papers start to examine the how to enhance the effectiveness of audit committee in terms of increasing AC member motivations. Director compensation plans in practice are more likely to be an unresolved agency problem, rather than a tool to reduce the agency costs between top management and shareholders. Brick, Palmon, and Wald (2006) find a strong positive association between excess CEO comopensation and excess director compensation. Moreover, Archambeault, DeZoort and Hermanson (2008) states that only small share of firms have option compensation for Audit committee, and AC option compensation is positive related to audit failure (financial report restatements). As a result, the implementation of AC compensation plans demands great precautions.

From agency theory perspective (Fama, 1980), reputation concerns are possibly a stronger motive for non-executive directors, because reputation assists in obtain more board seats or retaining the ones already held, a weak reputation the opposite. For audit committee members, the punishment for frauds of serving firms is even more severe, because it is their responsibility to prevent these frauds or scandals. Fich and Shivdasani (2007) document that in financial

fraud firms (have been involved in lawsuits), directors do see a significant drop in other board seats, this drop is greater for AC members. Moreover, audit committee members have accounting or finance backgrounds, and have lower social status than other types of directors (e.g., Erkens and Bonner, 2012). It indicates that audit committee members have to work harder to remain in the director market. Therefore, inspecting the function of reputation on audit committee members give us a clear setting about how reputation works, because audit committee members care about their reputation more than others and their responsibilities are clearer designed by corporate governance code (or law).

The auditor change, as AC's main task, has been chosen in our study. Auditor is most important goalkeeper in corporate governance. It can directly find top management's illegal activity director, provide directors information to assess CEO ability, and reduce the information asymmetry between top management and shareholders (all stakeholders). An external auditor change signals the desire and authority of audit committee members to increase the independence of external auditing and thus improve the audit quality. The first chapter of my thesis examines whether audit committees with a higher proportion of reputable members more likely to change auditor.

Using a sample of UK listed firms over the period from 2001 to 2009, I found that the likelihood of auditor change increases with the proportion of audit committee reputable members. Audit committee members with a higher reputation demand for higher audit auditors. The proportion of reputable members is positively related to the commonly used measures for audit quality, except for the industry-specialisation. The results suggest that reputation plays an important role in making audit committee members work diligently to improve the quality of financial reporting by changing auditors. Higher reputable audit committee members have more reputation incentives and influence to push through the idea of changing an auditor and choosing an auditor who provides a higher audit quality.

1.3.3 Alternative theories of board of directors in emerging markets (China)

The emerging markets call for a different package of corporate governance mechanism, since the institutional context vary from the developed countries and the agency conflicts happen between controlling shareholders and minority shareholder. Contrast to the U.S based evidence, emerging markets lack of external governance mechanisms. In these countries, internal governance mechanisms become more consequential (e.g., Ferreira and Matos, 2008; Klapper and Love, 2004). Specially, the cotrolling shareholder in the emerging market as discussed above is a source of princial-princial conflicts, rather than a governance mechanism. All these arguments rise an equation that how to improve the quality of corporate governance in emerging countries. Most police makers believe that one of low cost ways is to enhance the effectiveness of boards of directors. Corporate guidances of more and more emerging countries call for particular board structure and activities in listed firms. Therefore, whether board of directors work effectively in a emerging market is an empirical question.

I focus on Chinese market not only becasue it is the second largest ecnomy across the world but also the regulators of the Chinese market repetily emphasise the role of independent directors in Chinese listed firms. Additionally, independent directors are supposed to act in a similar way to those in the U.S. according to China's laws.

1.3.3.1 Resource dependence theory. It considers board of directors as boundary spanners who obtain resources from the environment (Pfeffer, 1972). It suggests that the resource-rich non-executive directors can bring more resources to the firm, so are beneficial to firm value. Empirical evidences mostly using U.S. data demonstrate that interlocking directorates may aid in corporations' borrowing, information attainment, and strategic alliance formation (e.g., Haunschild and Beckman, 1998; Gulati and Westphal, 1999).

China's institutional environment and organizations provide an opportunity to extend this research (Peng 2004). The Chinese culture have a higher propensity to rely on network ties, "Guanxi", to achieve business goals, on the condition of imperfect market (low trust and lack of efficiency). Li, Poppo, and Zhou (2008) find that foreign corporations could utilize managerial network ties to operate business in China, to add only conditional value. Sheng, Zhou, and Li (2011) show that directors' business ties and political ties have various effect on firm preformation based on different market eviroment. However, these studies and others employ small-sample interview and survey data. More research is necessary to explore whether director's ties atribute to firm value with larger-sample archival data.

1.3.3.2 Institutional theory. It proposes that directors may be appointed for different reasons: regulative, normative[3], and cognitive reason (Meyer and Rowan, 1977). In China, the mandatory requirements on board structure launched in 2001, as a part of marketization of listed firms (CSRC, 2001). List firms have to appoint independent directors who account for at least one third of total number of directors. the board of directors. However, the responsibilities and accountabilities of independent directors are not well designed in related regulation rules or law. Hence the regulative pressure is questionable in the Chinese context. The normative pressure of the institutional environment could enhance the probability of appointing high-quality independent directors. Yet the scholars' opinion and media coverage of improving the role of directors in listed firms may not strong enough in China (Peng, 2004). Cognitive pressures may be vague as well. Even in the U.S., top management often select independent directors who are less like to challenge them (e.g., Westphal and Zajac, 1996).

[3] Organizations seek to behave in ways that will not cause them to be noticed as different and consequently singled out for criticism

Overall, listed firms could only appoint independent directors in order to comply with the institutional demands, but the independent directors' representation may not increase firm value.

1.3.4 Empirical research on independent directors in China: firm value, earnings management, related party transactions, CEO turnover and compensation.

Whether boards of directors contribute corporate governance in China's context is still under debates. The U.S style system of boards of directors formally launched in China in 2001. Since then, numbers of studies have examined the effects of independent directors on firm value, CEO dismissal and compensation, earnings management, and related party transactions. These outcomes are associated with type I and type II agency problem.

Empirical studies documents mixed results on the relationship between board independence and firm performance. Studies employed data from 1999[4] over three or five years often show insignificant association (e.g., Peng, 2004). In contrast, recent studies which use longer panel data from 2005, often documents board independence improves firm operating performance with various robustness checks and identification strategies (Liu et al., 2015). Liu et al. (2015) find that board independence reduces tunneling through intercorporate loans and improves investment efficiency, especially in government-controlled firms. Lo et al, (2010) shows that firms with a board that has a higher percentage of independent directors or a lower percentage of "parent" directors (i.e., directors who are representatives of the parent companies of the listed firms) are less likely to engage in transfer pricing manipulations.

[4] In 1999, CSRC started to draft the 'Guidance of independent directors of China', the code was implemented from 2001.

Executive turnover and compensation, and their sensitivities to firm performance have been the focus of numerous studies. They specify crucial measures of governance effectiveness with which a firm solves two principal–agent problems. First, the interest conflicts between top management and shareholders result in managerial entrenchment. Second, interest conflicts between the controlling shareholders and the minority shareholders may lead to the expropriation of the latter by the former. The second agency problem is analyzed and referred to as tunneling by Bebchuk (1999), Johnson, Boone, Breach, and Friedman (2000), and Peng, Wei, and Yang (2011). By linking the personal fortune of top executives to the performance of the firm, the interests of the shareholders and those of management are aligned. In addition, the insider alliance between the controlling shareholder and management is also severed so that the interests of outside investors or minority shareholders are protected to some extent. Hence, the relationship between executive turnover and performance can be indicative of the quality of the corporate governance system in a firm.

The relationship between CEO turnover (compensation) and performance have been One increase concern in China's context is entrenched managers: whether internal corporate governance mechanisms work to dismiss underperformed CEOs who are often affiliated with the controlling shareholders). Since the early 2000s China's public firms have been under pressure from investors to reform (Allen et al., 2005), the institutional context may change. New empirical studies are needs to investigate the whether independent directors could play the effective discipline role. In summary, previous empirical studies often use board composition (the ratio of independent director, political connected director etc.) to measure internal governance quality with short panel data.

The China Securities Regulatory Commission (CSRC) emphasises the monitoring role of independent director system from 2001. CSRC also introduced a practice[5] that differs from those adopted in developed markets. That is, independent directors are obliged to issue *Report[s] of the Independent Director* after meetings, in order to publicly release topics discussed and their opinions on important board decisions. These reports provide us new possibility to test whether boards of directors work effectively or not in Chinese context. From these reports, I calculate meeting frequency of various meeting topics and estimate the tone of these reports, and examine how the outcomes of firm optimal decisions influence corporate governance and firm value in Chapter 2 and 3.

1.3.5 Quality of corporate governance and various type of board meetings: evidence from China (Chapter 2).

I examine the relationship between numbers of topic-specific board meetings and efficiency of corporate governance. Quality of corporate governance is proxy by CEO turnover-performance and compensation-performance sensitivities. The measures of numbers of topics-specific meeting are calculated based on the reports of independent directors of Chinese listed firms over the period of 2005 to 2015. We document that directors meet more often to discuss growth strategies for the use of IPO proceeds, investment and acquisitions can increase the CEO compensation-performance sensitivity. Moreover, more discussing the nomination of directors and top management decrease the sensitivities of CEO turnover and compensation to performance. It sheds light on what makes boards more effective, and how board monitoring of different decisions at board meetings modifies the connection between CEO interests and firm performance.

---

[5] The new corporate governance guidelines for Chinese listed firms (2001, 2002).

1.3.6 Hidden information from reports of independent directors: evidence from China (Chapter 3)

I examine whether the information content of independent director reports (IDRs) has predication power on corporate performance. We generate the tone of IDRs by using Chinese word segmentation and Naïve Bayesian machine leaning algorithm. We find that the average tone of the IDRs is positively related with future firm performance after controlling other factors that influence firm performance. Our results also show that directors with more careers concerns are more likely to be critical and using negative tone when they express opinions. Furthermore, the negative tone of IDRs is negatively associated with firm performance for firms with greater monitoring necessities. This study provides new evidence on corporate disclosures by using a large sample dataset of director's views on firm profitability. It explores directors' roles in corporate governance via director disclosures rather drawing interferences from board structure such as board composition.

Bibliography

Adams, R. B., Hermalin, B. E., & Weisbach, M. S. 2010. The role of boards of directors in corporate governance: A conceptual framework and survey. *Journal of Economic Literature*, 48(1): 58–107.

Allen, F., Qian, J., & Qian, M. (2005). Law, finance, and economic growth in China. Journal of financial economics, 77(1), 57-116.

Archambeault, D. S., DeZoort, F. T., & Hermanson, D. R. (2008). Audit committee incentive compensation and accounting restatements. Contemporary Accounting Research, 25(4), 965-992.

Bai, C. E., & Xu, L. C. (2005). Incentives for CEOs with multitasks: Evidence from Chinese state-owned enterprises. *Journal of Comparative Economics*, *33*(3 SPEC. ISS.), 517–539.

Berger, A. N., Hasan, I., & Zhou, M. (2009). Bank ownership and efficiency in China: What will happen in the world's largest nation? *Journal of Banking and Finance*, *33*(1), 113–130.

Berle, A. a, & Means, G. C. (1932). The Modern Corporation and Private Property. *Macmillan Publishing Company*, *21*(1), 380.

Brick, I. E., Palmon, O., & Wald, J. K. (2006). CEO compensation, director compensation, and firm performance: Evidence of cronyism?. *Journal of Corporate Finance*, *12*(3), 403-423.

Chen, G., Firth, M., & Xu, L. (2009). Does the type of ownership control matter? Evidence from China's listed companies. *Journal of Banking and Finance*, *33*(1), 171–181.

Chen, X., Harford, J., & Li, K. (2007). Monitoring: Which institutions matter? *Journal of Financial Economics*, *86*(2), 279–305.

Conyon, M. J., & He, L. (2014). CEO turnover in China: the role of market-based and accounting performance measures. The European Journal of Finance, 20(7-9), 657-680.

Demsetz, H. and Lehn, K. (1985). 'The structure of corporate ownership: causes and consequences'. Journal of Political Economy, 93, 1155–77.

Erkens, D. H., & Bonner, S. E. (2012). The role of firm status in appointments of accounting financial experts to audit committees. The Accounting Review, 88(1), 107-136.

Fama, E. and Jensen, M. (1983). 'Separation of ownership and control'. Journal of Law and Economics, 26,301–25.

Ferreira, M. A., & Matos, P. (2008). The colors of investors' money: The role of institutional investors around the world. Journal of Financial Economics, 88(3), 499-533.

Fich, E. M., & Shivdasani, A. (2007). Financial fraud, director reputation, and shareholder wealth. Journal of Financial Economics, 86(2), 306-336.

Firth, M., Fung, P. M., & Rui, O. M. (2006). Firm performance, governance structure, and top management turnover in a transitional economy. Journal of Management Studies, 43(6), 1289-1330.

Firth, M., Fung, P. M., & Rui, O. M. (2007). How ownership and corporate governance influence chief executive pay in China's listed firms. Journal of Business Research, 60(7), 776-785.

Gulati, R., & Westphal, J. D. (1999). Cooperative or controlling? The effects of CEO-board relations and the content of interlocks on the formation of joint ventures. Administrative Science Quarterly, 44(3), 473-506.

Haunschild, P. R., & Beckman, C. M. (1998). When do interlocks matter?: Alternate sources of information and interlock influence. Administrative science quarterly, 815-844.

Hart, O. D. (1995). Firms, contracts and financial struture. *Revista de Economía Aplicada, Oxford, Clarendon Press*, *IV*(10), 199–204.

Holmstrom, B. (1979). Moral hazard and observability. *The Bell Journal of Economics*, *10*(1), 74–91.

Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *Am. Econ. Rev.*, *76*(2), 323–329.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4), 305–360.

Jiang, F., & Kim, K. A. (2015). Corporate governance in China: A modern perspective. *Journal of Corporate Finance*, *32*, 190–216.

Johnson, S., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2000). Tunneling. *American Economic Review*, *90*(2), 22–27.

Kato, T., & Long, C. (2006). Executive turnover and firm performance in China. The American

economic review, 96(2), 363-367.
Klapper, L. F., & Love, I. (2004). Corporate governance, investor protection, and performance in emerging markets. Journal of corporate Finance, 10(5), 703-728.
La Porta, R., Lopez-De-Silanes, F., & Shleifer, A. (1999). Corporate Ownership Around the World. *The Journal of Finance*, *54*(2), 471–517.
Li, J. J., Poppo, L., & Zhou, K. Z. (2008). Do managerial ties in China always produce value? Competition, uncertainty, and domestic vs. foreign firms. Strategic Management Journal, 29(4), 383-400.
Liu, Y., Wei, Z., & Xie, F. (2014). Do women directors improve firm performance in China?. Journal of Corporate Finance, 28, 169-184.
Liu, Y., Miletkov, M. K., Wei, Z., & Yang, T. (2015). Board independence and firm performance in China. Journal of Corporate Finance, 30, 223-244.
Lo, A. W., Wong, R. M., & Firth, M. (2010). Can corporate governance deter management from manipulating earnings? Evidence from related-party sales transactions in China. Journal of Corporate Finance, 16(2), 225-235.
Morck, R., Yeung, B., & Yu, W. (2000). The information content of stock markets: why do emerging markets have synchronous stock price movements? *Journal of Financial Economics*, *58*(1–2), 215–260.
Peng, M. W. (2004). Outside directors and firm performance during institutional transitions. Strategic management journal, 25(5), 453-471.
Pfeffer, J. (1972). Size and composition of corporate boards of directors: The organization and its environment. Administrative science quarterly, 218-228.
Sheng, S., Zhou, K. Z., & Li, J. J. (2011). The effects of business and political ties on firm performance: Evidence from China. Journal of Marketing, 75(1), 1-15.
Shleifer, A., & Vishny, R. W. (1997). A survey of corporate governance. *The Journal of Finance*, *52*(2), 737–783.
Tirole, J. 2001. Corporate governance. *Econometrica*, 69(1): 1–35.
Tirole, J. 2010. *The theory of corporate finance*. Princeton University Press.
Wei, Z., Xie, F., & Zhang, S. (2005). Ownership Structure and Firm Value in China's Privatized Firms: 1991–2001. *Journal of Financial and Quantitative Analysis*, *40*(1), 87.
Yermack, D. (1996). Higher market valuation of companies with a small board of directors. *Journal of Financial Economics*, *40*(2), 185–211.
Young, M. N., Peng, M. W., Ahlstrom, D., Bruton, G. D., & Jiang, Y. (2008). Corporate governance in emerging economies: A review of the principal–principal perspective. Journal of management studies, 45(1), 196-220.
Zajac, E. J., & Westphal, J. D. (1996, August). Director reputation, ceo/board power, and the dynamics of board interlocks. In Academy of Management Proceedings (Vol. 1996, No. 1, pp. 254-258). Academy of Management.

Chapter 2: Audit Committee's Reputation and Auditor Change: Evidence from UK Listed Companies

ABSTRACT

We examine whether director reputation affects audit committee effectiveness in maintaining and improving external audit quality. We argue that the director's reputation can be a source of incentives to motivate audit committee members to work diligently and demand a high quality audit. Reputation is also related to substantive power and influence, which can enhance the authority of the audit committee members when fulfilling their responsibilities. We find that an audit committee consisting of many reputable members is more likely to change the auditor. They're also more likely to employ an auditor with a highly recognised brand-name or an auditor with a larger size. This study enhances our understanding of the role of reputation incentives in audit committee effectiveness.

Key Words: Auditor change, Audit committee, Reputation, Corporate governance

3.1 Introduction

An audit committee plays an important monitoring role in improving the quality of financial reporting and ensuring the independence of statutory auditing (Cadbury Committee, 1992; Sarbanes-Oxley Act, 2002; Smith Committee, 2003; Klein, 2002). The call for a more effective audit committee as an important source of improvement in corporate governance becomes more urgent with each wave of financial irregularities especially after a number of high-profile accounting scandals (e.g., Enron, World.com). A large body of literature on audit committee effectiveness have focused almost exclusively on audit committee independence, composition and the experience/expertise of individual directors. To date, few studies have investigated the non-pecuniary incentives of audit committee members. This work aims to investigate whether the reputation of audit committee members affect audit committee effectiveness.

Dezoort *et al.* (2002, P.41) define an effective audit committee as a committee that "*has qualified members with the authority and resources to protect stakeholder interests by ensuring reliable financial reporting, internal controls, and risk management through its diligent oversight efforts*". Authority (e.g., responsibilities, influence), composition (e.g., independence, expertise), resources (e.g., access to management) and diligence (e.g., incentives, motivation) are the main components affect the performance and effectiveness of an audit committee in fulfilling their responsibilities. Kalbers and Fogarty (1993) consider the willingness of an audit committee to carry out their duties as their most important attribute. Audit committee's influence, combined with their responsibilities derived from the law and regulations (e.g., SOX, Cadbury Report and Combined Codes), gives audit committee members the authority to act in the best interest of shareholders. We analyse the role of director reputation in motivating directors' due diligence and exerting influence from the agency and the organisational sociology perspectives.

From the perspective of agency theory (Fama and Jensen, 1983; Fama, 1980), directors have strong incentives to preserve and enhance their reputation, which directly influences the value of their human capital and the probability of them losing or getting directorships in the future. In an efficient managerial labour market, directors who have a reputation as a good monitor will be rewarded with board appointments at other firms and associated benefits such as compensation, prestige, power and access to valuable networks (Levit and Malenko, 2016). Lax directors who act against shareholder interests will be penalised by losing their positions and benefits. Penalties for poor monitoring are more severe to audit committee members who are held accountable (e.g., Ertimur, Ferri, and Maber, 2012; Fich and Shivdasani, 2007). Srinivasan (2005) documents substantial turnover for audit committee members, but only a small decline in other board seats held by outside directors in firms restating earnings. The Tesco accounting scandal in 2014/15 led to turnovers for all audit committee members before 2016, while other non-executive directors kept their posts.

Beyond offering incentives for due diligence, reputation is directly related to substantive power and influence which can enhance the authority of audit committee members. The reputation and status of participants shapes the conversations and communication in groups. Therefore, firm decisions are viewed as an outcome of interactions between the management and the board of directors (Forbes and Milliken, 1999). Audit committee members need both the ability and authority to gain respect from managers to influence the auditing and financial reporting process. Reputation can directly influences how managers view the audit committee members' ability and competency, which provides disincentives for managers' self-interested behavior, such as manipulating accounting numbers (D'Aveni, 1990; Pollock et al., 2010; Badolato *et al.,* 2014).

Drawing from directors' reputation incentives and influence, this study aims to shed some light on the question of whether audit committees with a higher proportion of reputable

members are likely to be more effective in fulfilling their responsibilities. According to the Combined Code (2008), one of audit committee responsibilities is to make recommendations to the board on appointment, re-appointment and removal of the external auditor, review and monitor the independence of the external auditing process. The management in a normal operation is less willing to change the external auditor due to risk and cost concerns. The process of auditor selection and re-educating a new auditor makes auditor switching costly (Blouin, Grein, and Rountree, 2007). It could also send a negative signal to the capital market (Knechel, Naiker, and Pacheco, 2007). To reduce agency costs and information asymmetry between the management and shareholders (Jensen and Meckling, 1976), the audit committee should ensure a dependent external auditing of high quality. The audit committee will change the external auditor only when agency benefits is in excess of switching costs (DeFond, 1992). An external auditor change signals the desire and authority of audit committee members to increase the independence of external auditing and thus improve the audit quality. DeAngelo (1981a, 1981b) suggests that the quality of services supplied varies among auditors. Changing the external auditor results in a change in the audit quality.

Measuring external audit quality is a difficult exercise, as the degree of assurance that auditors provide is unobservable. Under the framework of DeFond and Zhang (2014), auditor's incentives for independence associated with reputation and litigation costs, as well as auditor's competency reflected in factors such as expertise, can affect the supply of audit quality. Following the literature, we use three proxies for audit quality: auditor name-brand reputation, size (Johnson and Lys, 1990) and industry specialisation (Craswell, Francis, and Taylor, 1995). Reputable audit committee members are expected to select an external auditor with a better name-brand reputation/larger size, or the one who is more specialised in the client's industry.

This study offers two main contributions to the literature. First, in answering the question of whether a director's reputation affects audit committee effectiveness in maintaining and

improving external audit quality, it provides a theoretical contribution by analysing audit committee members' reputation with their due diligence and influence from both agency and organisational sociology perspectives. While previous research focuses on independence, activity and accounting/finance expertise on audit selection (Abbott and Parker, 2000), restatement (Abbott, Parker, and Peters, 2004), and earnings management (Klein, 2002), this research reveals a new channel through which reputation motivates and enables audit committee members to effectively fulfil their responsibilities.

Second, this study extends the literature related to director's non-pecuniary incentives. Recent empirical research (e.g., Adams and Ferreira, 2008; Yermack, 2004) finds that the financial incentives of non-executive directors are not strong enough to motivate effective monitoring. Only one study, to date, explores the effect of reputation incentives for all independent directors on firm performance (Masulis and Mobbs, 2014). They treated non-executive directors' responsibility equally, investigating how boards affect firm performance. However, whether the increase in firm value comes from board monitoring or the advisory channel is not clear. In fact, the ability and experience of individual directors on a board are diversified and they are appointed to a board to play different roles. Fama and Jensen (1983) argue that there will be a 'substantial devaluation of human capital' when directors neglect their monitoring duties. Audit committee members, who are responsible for monitoring, are less likely to find a directorship in another listed firm due to a lower social status for accounting/finance experience (Erkens and Bonner, 2013), but they more likely to be penalised due to financial irregularities. We provide new evidence on the effect of a director's reputation in an environment with high reputation cost.

In the following section, a framework to explain the effects of director reputation on audit committee effectiveness will be presented and the main hypothesis will be developed. The sample, measures and a research model will be clarified and introduced in Section 3. This is

followed by the analysis of the main results on auditor (quality) change in Section 4. In Section 5, we develop and show our examinations of earnings quality corresponding to voluntary and involuntary auditor changes. A final discussion of the results is given to conclude this study in Section 6.

3.2 Literature Review and Hypothesis Development

3.2.1 The Role of the Audit Committee in UK Corporate Governance

To improve the quality of financial reporting and ensure an independent statutory audit, the Cadbury Committee (1992) argued that the board should establish an appropriately structured audit committee of at least three non-executive directors with terms which clearly clarify its authority and duties. Building on this, the subsequent UK experience of audit committees was consolidated and given additional authority through a series of publications (i.e., Combined Code 1999, 2003; 2006; 2008; Financial Reporting Council 2010) regarding audit committee composition, independence and expertise.

So far, the literature on the effectiveness of audit committee in the UK is very limited. Weir, Weir, Laing, and McKnight (2002) find that the existence of audit committee has no impact on firm performance. Goddard and Masters (2000) fail to find the existence of audit committee affects the size of auditing fees. Another strand of literature on UK auditing committees explores whether the composition and characteristics of the audit committee matters for its effectiveness. O'Sullivan (2000) documents that the independence of external auditors, measured by audit fees, is likely to be improved by a higher proportion of non-executive directors. Mangena and Pike (2005) find a positive association between UK audit committee financial expertise and interim disclosure. Mangena and Tauringana (2008) show that audit committee size and number of meetings do not affect the decision to engage auditors in interim

financial reporting. Given that research beyond composition and activity of audit committees in the UK is scarce, we aim to contribute to the literature to explore the role of reputation of audit committee members.

3.2.2 Audit committee Reputation: Incentive and Authority

Under the theoretical framework of Dezoort *et al.* (2002) and Ghafran and O'Sullivan (2013), an audit committee serves the ultimate goal of the protection of stakeholder interests by using qualified audit committee members with authority and resources to provide diligent oversight. Director reputation provides a primary incentive to motivate audit committee member's due diligence, and reputation is directly related to their influence in fulfilling the responsibilities. Fama (1980) and Fama and Jesen (1983) argue that outside directors have incentives to develop a reputation as an effective monitor to signal to shareholders as well as the labour market. In an efficient labour market, reputation is a valuable asset. Any significant increase in reputation opens up opportunities to additional directorships (Fama, 1980), while a single failure causes a large decline in its value (Diamond, 1989). Hence, directors are more self-disciplined to maintain and develop their reputation to gain more board seats and thereby obtain prestige, power, compensation and access to valuable networks (Levit and Malenko, 2016). Reputation incentives are found to motivate independent directors to improve monitoring with an increased board attendance rate (Masulis and Mobbs, 2014) and engage in active monitoring with more management proposal dissensions at board meetings (Jiang, Wan, and Zhao, 2016).

In line with the view that an effective monitoring reputation is rewarded, a few studies have found directors are held accountable for failing to monitor the management. Coles and Hoi (2003) show that non-executive directors who rejected all or some of the Pennsylvania Senate Bill 1310 (SB1310) antitakeover provisions were three times as likely to gain external directorships as those who retained the provisions over the three years after SB1310. Srinivasan

(2005) documents substantial turnover for audit committee members, but only a small decline in other board seats held by outside directors in firms restating earnings. Fich and Shivdasani (2007) find that, following a financial fraud lawsuit, directors are likely to lose board seats at other firms, particularly those with strong governance.

An audit committee with strong composition, resources and willingness to act on behalf of shareholders also needs the authority to achieve effectiveness. Authority is a function of an audit committee's responsibilities (derived from law, regulations, guidance) and influence. The influence also depends on the audit committee's relationship with management, internal/external auditors and the board, as a whole. More reputable directors are able to stay focused on their own goals and have more of an ability to obtain firm information. Their ability and willingness to monitor have been recognised in the labour market (Levit and Malenko, 2016). Audit committees with higher reputation are considered to be more experienced and authoritative from the past provisions or the peer reviews, because reputation improves command respect (D'Aveni, 1990). Badolato, Ege, and Donelson (2013) reveal that audit committees reduce the accounting irregularities and abnormal accruals when at least one higher-status financial expert sits on the committee. Beck and Mauldin (2014) find that the negotiation of an audit fee reduction relies on the relative power of the audit committee and the CFO.

3.2.3 The Effect of Audit Committee Reputation on Auditor Change and Auditor Quality

The management in a normal operation is less likely to change the external auditor, as an auditor change can be very costly. The Survey of the US General Accounting Office (2003) shows that 92 per cent of the respondents from Fortune 1000 firms considered switching to a new auditor as problematic. This is because the client (management) needs to educate the new auditor about the firm's operations, systems, financial reporting practices, and accounting

issues. The education process is a time-consuming and expensive activity. The selection process of a new auditor is also costly. The change of an auditor may increase the risk of audit failure (Geiger and Raghunandan, 2002). It also has a significant negative impact on the short-term stock returns (Krishnamurthy, Zhou, and Zhou, 2006). Reports of resigned/dismissed auditors often disclose the weakness in a firm's corporate governance, which leads to a negative market reaction (Hammersley, Myers and Shakespeare, 2008; Teoh, 1992). Auditing serves as an important monitoring mechanism to provide assurance on the credibility of financial statements to mitigate agency problems in public firms (Jensen and Meckling, 1976).

It's unclear, however, whether director reputation provides audit committee members with sufficient incentives and influence to fulfil their responsibilities on behalf of shareholders. The underlying reason for this is that the composition of a board is endogenously chosen when top management has a significant amount of control over it (Hermalin and Weiback 1998). It's reasonable to assume that the top management is more likely to appoint directors who would comply with the management's desires (Lorsch, J. W., 1989; Zajac and Westphal, 1996). In addition, audit committee members often climb up the elite ladder by working in the accounting or finance industry. They have a relatively lower status than other types of directors in the serving firm (D'Aveni, 1990). As a result, these restrain audit committee members to be effective monitors.

Reputation motivates audit committee members' due diligence and enables them to exert more influence on the overseeing process. The audit committee members, with accounting and finance background, tend to have a lower status (the prestige accorded actors because of their social position) than the other directors (Erkens and Bonner, 2013). This results in a lower probability of members in audit committees being appointed in larger firms. Reputation is defined by the prestige accorded because of their prior performance and occupation (Wilson, 1985). The occupational factor is associated with being linked to social resources attainments

(Hollingshead, 1975; Lin, Vaughn, and Ensel, 1981). Directors who work in the larger firms are more likely to have a higher status, which could help them play more of an important role in the group decision-making process.

If an audit committee member is working in a larger firm, it indicates that their capability as a diligent monitor has been recognised by the director's labour market. Firm uses directors to build its reputation, while a director also uses the directorship to enhance his/her personal reputation. Directorship is not just a job description, but more importantly a process in advancing in reputation and contacts (Weigelt and Camerer, 1988). They have more reputation incentives to be independent of the management and have more influence in the negotiations with managers, when there are conflicts between them and the managers.

The empirical research argues that firm size is a natural source of director reputation incentives. Larger firms provide a director with greater visibility, status (Adams and Ferreira, 2009), reimbursement (Ryan and Wiggins, 2004), and the possibility of gaining extra directorships (Yermack, 2004). Our reputation measure is similar to Masulis and Mobbs (2014), as it is based on the size of a firm relative to other firm that an independent director also serves. Thus, we hypothesise the following:

H_1: Audit committees with a higher proportion of reputable members demand for a higher audit quality.

3.3 Methods

3.3.1 Sample selection

This study investigates the effects of audit committee reputation on a sample of non-financial firms listed on the London Stock Exchange over the period of 2001 to 2009. We examine this sample period to rule out the effects of the merger between Price Waterhouse and Coopers & Lybrand in 1998 and the financial crisis after 2008. Our data originates from two sources. The financial data was retrieved from Worldscope via DataStream, which offers

fundamental data on public and private firms. Our initial sample includes approximately 4,900 firm-year observations. The corporate governance data of the listed firms and firms' auditors were manually collected from the *Corporate Register*. The *Corporate Register* covers self-reported information for all the UK companies regarding market capitalisation, equity share capital, directors, bankers, financial advisers, and auditors. Both databases claim that they contain the population of all public firms. Yet, approximately 10 per cent of observations are not overlapping. To diminish the potential outlier issue, we winsorise the outliers of the financial data by the top and bottom 1 per cent of the distribution annually. Firms that have less than three years of observations and have more than one auditor are excluded from the sample. The final dataset contains 668 firms (4,415 firm-year observations) with auditor, financial and governance information.[6]

The auditor change selection process follows a two-step procedure. First, a sample that involved all of the auditor changes was selected from 2001 to 2009. In total, 219 changes were identified by auditor name-brand switches (e.g., from "Deloitte and Touche" to "Ernst and Young"). Secondly, a sub-sample of involuntarily auditor changes (Arthur Andersen's 66 clients), due to AA surrendered its CPA licences in 2002, were excluded. As a result, a sample of 156 voluntary changes (889 observations) was utilised in our main analysis.

3.3.2 Dependent Variables

Auditor Change. This is the dependent variable. It is equal to one when the current auditor differs from the previous auditor, and zero otherwise. It contains only voluntarily changes. Panel A in Table 1 shows that the auditor change rate in the UK was very low, on average, the

[6] Muravyev, Talavera and Weir (2016) also used *Corporate Register*, They mentioned the issue of reducing observations when merging datasets. Our sample size for non-financial firms in the UK is similar to theirs.

change rate was 4.03% over the period of 2001 to 2009. This is consistent with the figures in the Oxera Report (2006).

Table 1.

Auditor changes and audit quality changes from 2002 to 2009

Panel A: Auditor changes by year

Year	Number of Firms	Frequency of Auditor Change	Percentage of Auditor Change
2002	569	25	4.39%
2003	581	23	3.96%
2004	542	15	2.77%
2005	491	26	5.30%
2006	446	10	2.24%
2007	446	32	7.17%
2008	420	14	3.33%
2009	376	11	2.93%
Total	3871	156	4.03%

Panel B: Changes related to name-brand reputation

	From Big Four to local (-2)	From Big Four to national or from national to local (-1)	No change in reputation (0)	From national to Big Four or from local to national (1)	From local to Big Four (1)
Number of Changes	13	22	82	28	11

Panel C: Changes in auditor size

	Mean	Median
Changes in auditor size [(a)]	1.074	1.039

Panel D: Changes related to industry specialisation

	From industry specialist to non-specialist (-1)	No change in industry specialist (0)	Non-industry specialist to industry specialist (1)
Number of Changes	36	87	33

(a) Notes: Changes in auditor size is measured as the ratio of new auditor size over the incumbent auditor size.

Changes in the external auditor quality are also used as dependant variables. Three measures for audit quality have been utilised in this study to capture the changes in the likelihood that the auditor will discover and disclose substantial violations in the accounting system.

Proxies for Auditor Quality. Auditor quality has been measured in several ways in the literature. One key measure is *(1) Name-Brand Reputation* that uses memberships in the Big X[7], national reputation and regional/local reputation to group auditor reputation. It is usually the case that an auditor's revenue is positively related to its reputation. The revenue (client-specific quasi-rents-fee premium [8]) will be reduced if there is an audit failure (Ding and Jia, 2012; DeAngelo, 1981b). Wealthier auditors are exposed to higher litigation risks and suffer more from accounting scandals, and therefore they have a greater incentive to supply a high-quality service to protect their reputation and wealth (Dye, 1993).

In this study, a value of two is assigned to the Big Four auditors that have an international reputation; values of one and zero are given to second-tier firms that have a national reputation and other auditors that have only a regional/local reputation, respectively. The classification criterion is based on the fee income of the major auditor firms, published by the Financial Reporting Council (2005). Audit fee incomes for audit firms with international reputation are between £496.0M and £290.7M; incomes for auditors with national reputation ranges from £55.8M to £27.0M; income for other auditors are below £19.7M. The change related to the name-brand reputation is measured as the value of the new auditor minus the value of the incumbent auditor, yielding a variable of five values (-2, -1, 0, 1, 2). This is a ranked-order variable: positive numbers mean an increase in name-brand reputation, zero indicates no change, and negative numbers show a decrease. For example, when a firm changes from an auditor with local-reputation to an auditor with international-reputation, the change in the auditor quality has a value of two. Similar measures have been applied in other empirical studies (e.g., DeFond, 1992).

---

[7] Big Five Accounting Firms contains Ernst & Young, Deloitte & Touche, Arthur Andersen, KPMG and PriceWaterhouseCoopers. After the collapse of Arthur Andersen in 2001, the Big Five became to Big Four.
[8] Quasi-rents equal the excess of audit fees over the avoidable costs of performing the audit.

(2) Auditor Size is highly related to auditor experience and independence. This is another proxy for audit quality. A larger auditor with larger offices provides a higher quality than smaller ones due to greater in-house experience in administering (e.g. Francis and Yu, 2009). Specifically, they are more likely to issue going-concern audit reports and clients of larger offices are found to engage in less aggressive earnings management (Francis and Yu, 2009). Size can also affect an auditor's independence. The larger the specific client firm's fees are in relation to the total fees earned by the auditor, the auditor will be less willing to disclose a breach, for fear of losing the client (DeAngelo, 1981b). In particular, large auditors (with a greater number of clients) have 'more to lose' by failing to report a discovered breach in a particular client's records. When the size of the new auditor is comparable with, or significantly larger than, the incumbent auditor, the audit quality will increase from the improvement of independence or experience. The new auditors are believed to be in favour of investors by disclosing new private information about the client, such as the reinsurance of the quality of the financial statement (Teoh, 1992). Following Johnson and Lys (1990), we use auditor's client sales as a proxy for auditor size, because the client's sales are correlated with the auditor's quasi-rents. We measure changes in auditor size using the ratio of new auditor size over the incumbent auditor size.

(3) Industry-Specialist Auditors: The industry-specialist auditors have greater competency and stronger incentives to provide a high-quality service. Specialist auditors intend to maintain quasi-specific rents for a brand label[9], and have a better understanding and more experience in that industry (Balsam, Krishnan, and Yang, 2003; Craswell, Francis, and Taylor, 1995). They are more likely to detect and report financial statement errors or fraud, and thus, provide a

[9] For instance, IPO clients are more likely to choose industry specialised auditors and are willing to pay higher fees (Mayhew and Wilkins, 2003). Firms switching between the Big Four auditors experience significant positive abnormal returns when the successor auditor is an industry specialist and negative returns when they're not a specialist (Knechel, Naiker, and Pacheco, 2007).

higher level of assurance to the audit committee. Industry-specialised auditors, with greatest number of clients within an industry, will not jeopardise their reputation for one single client, which might cause a decrease in their market share (DeAngelo, 1981). The industry membership is classified based on super-sectors (two-digit code) of *FTSE* Industry Classification Benchmark (ICB), applied in the London Stock Exchange on the *Corporate Register*. Following Abbott and Parker (2000) and Craswell et al. (1995), we measure auditor specialisation by the numbers of clients in an industry and estimate each auditor's market share in that industry. An audit firm who serves more than 30 per cent of clients in one industry are considered an industry specialist. Firms are then coded as one if the auditor is changed from a non-specialist to a specialist, zero if they experience no change in industry specialisation, and minus one if they switch from an industry specialist to a non-specialist.

Panels B, C, and D of Table 1 report changes in external audit quality measured as name-brand reputation, auditor size and industry-specialised auditor selection.

Table2. Descriptive statistics, correlation coefficients and VIF for main independent variables

		Mean	VIF	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Auditor change	0.12	-	1												
2	Percent_reputable audit committee member	0.29	1.04	0.014	1											
3	Indicator_reputable audit committee	0.41	-	0.006	0.869***	1										
4	Accounting/Financial expert	0.40	1.03	-0.013	0.102***	0.136***	1									
5	Board independence	2.02	1.19	-0.035*	-0.060***	-0.033*	0.065***	1								
6	% Audit committee to Board	0.56	1.34	0.016	0.131***	0.232***	0.086***	0.124***	1							
7	Log(Board_size)	0.18	2.11	-0.068***	-0.033*	0.016	0.029	0.149***	-0.428***	1						
8	Leverage	11.71	1.14	-0.013	0.041**	0.035*	-0.002	0.064***	-0.094***	0.151***	1					
9	Account receivables	0.05	1.05	-0.009	-0.040**	-0.035*	-0.027	0.048**	-0.018	0.079***	-0.016	1				
10	Firm size	11.92	1.07	-0.077***	-0.045**	-0.007	0.043**	0.320***	-0.241***	0.665***	0.301***	0.176***	1			
11	ROA	0.05	2.28	-0.041**	-0.031*	-0.028	-0.016	0.018	-0.026	0.113***	-0.028	-0.025	0.199***	1		
12	Delist	0.15	1.01	0.007	0.033*	0.0264	0.010	-0.063***	0.027	-0.029	-0.033*	0.014	-0.064***	-0.042**	1	
13	CEO turnover	0.14	1.04	0.033*	-0.009	-0.015	-0.015	0.040**	-0.050**	0.005	0.061***	0.006	0.039*	-0.069***	0.001	1
14	Chairman turnover	0.06	1.04	0.042**	-0.019	-0.039*	0.010	0.040**	-0.079***	0.010	0.046**	0.016	0.047**	-0.040**	-0.005	0.177***

* p<0.05; ** p<0.01; *** p<0.001

3.3.3 Independent Variables

Audit committee's reputation proxies. It is our main variable of interest and, as elaborated previously, we utilise a relatively measure to assess an audit committee member's reputation and aggregate to access the reputation of the audit committee. A reputable audit committee member is defined by who serves on the firm's audit committee and has at least another board seat in a larger listed company (i.e., we compare the size of the enterprise value in each firm in which the director serves —"larger" denotes for 10% greater in firm size). Fama and Jensen (1983) argue that preserving and enhancing a reputation in the labour market for directorships is a primary motivation of directors. Firm size is a natural source of director reputation incentives. Previous studies (e.g., Adams and Ferreira, 2008; Ryan and Wiggins, 2004; Yermack, 2004) suggest that larger firms offer directors advantages with greater visibility, higher status reimbursement, and the possibility of gaining additional directorships. Masulis and Mobbs (2014) use the relative size of the firms supervised by the independent directors as a proxy for their incentives to monitor senior management.

The reputation of the audit committee is captured by *(A) Percent reputable audit committee member* as the percentage of reputable audit committee members on an audit committee and *(B) Indicator Reputable audit committee, a dummy variable* which equals one when a listed firm has at least one reputable audit committee member, and zero otherwise. Table 2 shows that approximately 12% of audit committee members are considered reputable in one listed firm, and 28.6% of firm-year observations have at least one reputable member.

3.3.4 Model Development

To examine the effect of audit committee reputation on the decision to change an auditor, we estimate the following logit model using panel data analysis to control for omitted variable

bias (Allison, 2009; Wooldridge, 2002). With a binary dependent variable (auditor change or not), the model is estimated by conditional logit/fixed-effect, controlling for firm and year fixed effects. Explanatory variables are lagged by one year to mitigate the simultaneous endogeneity problem.

$$Prob\left(Auditor\ Change_{i,t}\right) = G\ (\alpha + \beta\ Percent\ Reputable\ AC\ Member_{i,t-1} + \Sigma\ \gamma\ Controls_{i.t-1}) \quad (1)$$

where the dependent variable $Auditor\ Change_{i,t}$ is an indicator variable equalling one for firm i changing its external auditor at year t, and zero otherwise. $G(.)$ is the cumulative distribution function of the logit distribution. The main variable of interest is $Per\ cent\ Reputable\ AC\ Member_{i,t-1}$. Our main hypothesis is that the proportion of reputable audit committee members positively affects the probability of an auditor change, in other words, $\beta > 0$.

To examine whether an audit committee consisting of more reputable members demand for a higher quality audit, we estimate Equation (2)

$$Changes\ in\ audit\ quality_{i,t-1} = \alpha + \beta\ Percent\ Reputable\ AC\ Member_{i,t-1} + \Sigma\ \gamma\ Controls_{i.t-1}, \quad (2)$$

where the dependent variable $Changes\ in\ audit\ quality_{i,t-1}$ is measured as (1) changes related to name-brand reputation, (2) changes in auditor size and (3) changes related to auditor's industry specialisation. By definition, changes related to name-brand reputation and changes related to auditor's industry specialisation are ordinal variables, and both of them have more than two levels, so we apply the fixed-effects ordered logit model with the Blow-Up and Cluster (BUC) estimator (Baetschmann, Staub and Winkelmann, 2015). Furthermore, as the changes in auditor size is defined as a continuous variable, a fixed-effect model is employed

(Wooldridge, 2002). We expect that auditor quality to be positively related to the *Percent Reputable AC Member*.

A number of board/audit committee and firm characteristics that may affect firm auditor change have been controlled for in our analysis. Table 2 provides the descriptive statistics and pairwise correlations for the variables in the panel data regression. The variance inflation factor (VIF) is estimated to examine the severity of multicollinearity. The magnitudes of VIF are generally small—all are less than 2.28—indicating that the probability of multicollinearity is relatively low in Table 2. The definitions of main variables are provided in Appendix A.

Board and audit committee level controls. For board and director characteristics, we control for *board independence*, *board size, accounting/financial expert*, and *per cent of audit committee to board* (Badolato et al., 2013; Bruynseels and Cardinaels, 2014). CEO-Chair duality and executives on the audit committee are rare (less than 0.5%) in the UK. Thus, they are not included as controls.

Firm level controls. Prior literature suggests that the likelihood of an auditor change is positively related to leverage (debt over total assets) because firms have more demand for a quality auditor to reduce the cost of debt with increases in the debt level to illustrate financial statement credibility (Copley, Doucet, and Gaver, 1994) and reduce agency costs (DeFond, 1992). To control the auditor/client relationship, the firm size and growth respect (ROA) are incorporated (Reynolds and Francis, 2000). We also control the effects of accruals on auditor changes (Accruals) (Defond and Subramanyam, 1998).

Firm events controls. Previous studies indicate that there is an increased probability of an auditor change in turnovers of top management (Beattie and Fearnley, 1995), financial distress, or extreme contraction (Johnson and Lys, 1990; Schwartz and Menon, 1985). Thus, we control for firm events including CEO turnover, Chairman turnover, and Delisting (including takeovers, foreign registration and voluntary liquidation).

3.4 Results

3.4.1 Auditor Change

Table 3 presents regressions results for the effect of audit committee reputation on external auditor change based on Equation (1). The dependent variable, *Auditor Change*, is an indicator variable that equals one when the firm changes its auditor and zero otherwise. The coefficient of the explanatory variable, *Percent reputable audit committee member*, in Model (1) is significant and positive. This suggests that an auditor change is more likely to occur when the audit committee has more reputable members. We also find significantly positive coefficient on *Indicator reputable audit committee* in Model (2). Overall, our results show an increased probability of auditor change when audit committee members are more reputable.

Table 3 shows that there is a negative relationship between board size and auditor change. The effect of board size on firm value and corporate governance is inconclusive under different corporate governance system, institutional environment and culture (Eisenberg, Sundgren and Wells, 1998; Nakano and Nguyen, 2012; Yermack, 1996). Studies based on UK data find that the boards of directors tend to play an advisory role, rather than monitoring role. They find that board size has a negative influence on firm outcomes such as accounting profitability, Tobin's Q and stock returns, particularly in larger firms (Guest, 2008, 2009; John and Senbet, 1998).

Consistent with the prior literature (Hennes, Leone and Miller, 2014), leverage has a positively significant effect on auditor change. We argue that this is a consequence from the increase in agency costs between debt-holders and shareholders (also managers). Managers could take various actions to transfer wealth from debt-holders to shareholders, so debt-holders often use covenant based on accounting information to reduce these transfers (Jensen and Meckling, 1976). Debt-holders with more debt-holding demand for more monitoring and more reliable accounting information provided by external auditing.

Table 3. The role of audit committee member's reputation on auditor changes

	Dependent variable: Auditor change	
	(1)	(2)
Percent_reputable audit committee member	1.205**	
	(0.61)	
Indicator_reputable audit committee		0.616**
		(0.31)
Accounting/Financial expert	0.066	0.066
	(0.22)	(0.22)
% Audit committee to Board	1.043	0.712
	(1.14)	(1.16)
Log(Board_size)	-1.396**	-1.469**
	(0.69)	(0.72)
Board independence	0.169	0.158
	(1.31)	(1.30)
Leverage	1.918*	1.983*
	(1.12)	(1.12)
Account receivables	-1.056	-0.985
	(2.19)	(2.19)
Firm size	0.429	0.444
	(0.29)	(0.29)
ROA	0.238	0.204
	(1.36)	(1.35)
Delist	0.234	0.207
	(0.50)	(0.50)
CEO Turnover	0.188	0.177
	(0.27)	(0.27)
Chair Turnover	0.156	0.164
	(0.28)	(0.28)
Firm & Year fix effect	Yes	Yes
N	812	812
Pseudo R-squared	0.0807	0.0811

(a) ***, **, * denote for statistical significance at 0.01, 0.05, and 0.10 level, respectively.
(b) Definitions of explanatory and control variables are provided in Appendix A.

Personnel change of CEO and Chairman doesn't have a significant effect on audit change. This is inconsistent with the evidence documented in the US by Beattie and Fearnley (1995) and Johansen and Pettersson (2013). This partly supports our perception that auditor changes in the UK are mainly driven by the audit committee as their responsibilities are clearly defined since the recommendations of the Cadbury Committee (1992). The other control variables such as *Board independence, Firm size and Delist,* are not significant.

Overall, our results suggest that firms with a high proportion of reputable audit committee members have higher chances to change the external auditor.

3.4.2 Changes in Audit-Quality

In this section, we exam whether highly reputable audit committees demand for a higher-quality auditor who has a higher capability and incentives in discovering and disclosing breaches in a firm's financial reporting. Table 4 shows the regression results on changes in audit quality of three dimensions including name brand, size, and industry expertise based on Equation (2). The signs on the coefficients of *Percent reputable audit committee members* in Models (1) and (2) are significant, but not significant in Model (3) despite being positive[10]. Consistent with our hypothesis, the results indicate that when there are more reputable audit committee members, firms have a higher likelihood to select audit firms that have a better name-brand reputation or larger size.

Interestingly, we find that the association between the switch to an industry-specialist auditor and the percentage of reputable audit committee members is not significant. The auditor market in the UK becomes highly concentrated after 2001; almost all the FT350 firms select the Big Four as their auditors. PricewaterhouseCoopers (PwC) is an industry-specialist auditor with a market share of more than 30% in 11 out of 15 non-financial industries. The variable, *industry-specialised auditor*, almost becomes a dummy variable with a value of one when a listed firm chooses PwC as an auditor and zero otherwise.

For some control variables, the signs and strengths of coefficients vary with the choice of dependent variables. This is consistent with previous studies (e.g., Abbott and Parker, 2000;

[10] The regression results using *Indicator reputable audit committee* are consistent and are available upon request.

DeFond, 1992; Francis and Wilson, 1988) that the associations between the controls and the selection of an auditor are sensitive to the proxies employed to measure the auditor's quality.

Table 4. Audit committee member' reputation and changes in audit quality

	Dependent variable: Changes in audit quality		
Independent variables	(1) Name-Brand Reputation	(2) Auditor Size	(3) Industry Specialisation
Percent reputable audit committee member	1.788**	0.084**	0.523
	(0.87)	(0.04)	(0.65)
Accounting/Financial expert	-0.596*	0.015	-0.049
	(0.32)	(0.04)	(0.27)
Board independence	-0.611	-0.062	0.272
	(2.08)	(0.23)	(1.41)
% Audit committee to Board	-0.895	0.028	-0.305
	(1.35)	(0.19)	(1.17)
Log(Board_size)	2.526**	-0.347***	0.114
	(1.07)	(0.12)	(0.72)
Leverage	-0.874	0.193	-1.171
	(1.54)	(0.18)	(1.04)
Account receivables	0.839	-0.072	7.190**
	(1.77)	(0.38)	(3.18)
Firm size	-1.335***	0.063	-0.143
	(0.39)	(0.05)	(0.21)
ROA	1.788	-0.095	0.444
	(0.87)	(0.14)	(2.46)
Firm & Year fix effect	Yes	Yes	Yes
N	812	812	812
R- squared	-	0.062	-
Pseudo R-squared	0.107	-	0.020

(a) ***, **, * denote for statistical significance at 0.01, 0.05, and 0.10 level, respectively.
(b) Definitions of explanatory and control variables are provided in Appendix A.

3.5. Additional Analysis: Auditor Change and Financial-Report Quality

In this section, we provide additional analysis to examine whether auditor-change decisions by an audit committee/board would enhance the financial reporting quality, anther measure for the audit committee effectiveness. Auditing serves to reduce agency costs, such as earnings-management behaviour by the management (DeFond, 1992; Francis and Wilson, 1988). A voluntary auditor change by an effective audit committee/board implies that agency-cost

concerns overcome switching costs. Therefore, earnings quality should be improved after voluntary auditor changes. The collapse of AA provides a quasi-experiment to identify a sample of involuntary auditor changes.

We adopt the adjusted Jones model (Dechow, 1995) to estimate discretionary accruals (DACC) that has been used to estimate the earnings management[11]. To examine the auditor change's effect on the magnitude of discretionary accruals, we establish the following model:

$$DACC_{i,t} = \alpha + \beta Auditor\ change_{i,t-1} + \Sigma\, \gamma\ controls_{i,t-1}, \quad (3)$$

where $Auditor\ change_{i,t-1}$ is a dummy variable that equals one when firm i changes its auditor in year t–1 and zero otherwise. The control variables contain firm size, total accruals, and operating cash flows and leverage, which may affect the degree of DACC (Ding and Jia, 2012; Jenkins et al., 2006). For firms with voluntary auditors changes, β is expected to be negative, which indicates the auditor change reduces the level of DACC; while for firms with involuntary changes, β is not assumed to be significant.

Table 5 provides the regression results for the effect of voluntary and involuntary auditor changes on earnings management (DACC). Given that involuntary auditor changes occurred only over the period of 2001 to 2003 due to the collapse of AA, we estimate Equation (3) by using the sample of voluntary and involuntary changes from 2001 to 2005, respectively Models (1) and (2). Model (3) presents the results over the entire study period from 2001 to 2009.

[11] The method of estimating the DACC can be found in Appendix B.

Table 5. Effects of voluntary and involuntary auditor changes on earnings management

	(1) From 2001-2005	(2) From 2001-2005	(3) From 2001-2009
Voluntary Auditor Change	-0.019*		-0.018***
	(-1.78)		(-2.84)
Involuntary Auditor Change		0.020	
		(0.96)	
Leverage	0.097	0.144	0.060**
	(0.90)	(1.11)	(2.27)
Cash flow	-0.097	-0.488**	-0.322
	(-0.78)	(-2.65)	(-0.92)
Firm size	-0.027	-0.030	-0.019***
	(-1.08)	(-1.04)	(-2.73)
Total accruals	-0.273	-0.190	-0.155**
	(-1.50)	(-1.42)	(-2.57)
Year and firm fix effect	Yes	Yes	Yes
N	174	189	816
adj. R^2	0.283	0.136	0.230

(a) ***, **, * denote for statistical significance at 0.01, 0.05, and 0.10 level, respectively.
(b) Definitions of explanatory and control variables are provided in Appendix A.

The coefficients of voluntary auditor change are significantly negative, around -0.018, both in Models (1) and (3). This suggests that DACC has a negative relationship with voluntary auditor changes, indicating a substantial effect of voluntary auditor changes in enhancing earnings quality. However, the coefficient of involuntary auditor change is not significant in Model (2), indicating that the voluntary auditor change could not reduce the DACCs. Hence, it fails to improve the earnings quality of the listed firms.

The insignificant effect of involuntary changes could be explained by two reasons. First, firms in normal circumstances are less likely to engage in earnings management, so DACCs would not change in response to exogenous involuntary auditor changes. The second reason is that the name-brand change does not necessarily mean that the relationship between the auditing team and the client is broken. Due to the merger of Deloitte and AA, most of the AA staff in the UK transferred to Deloitte in 2002 and 2003 (The Guardian, 2002). Our data reveals that of AA's 66 clients, 47 were to get audited by Deloitte. The other 19 clients picked one of the other Big Three as auditors.

Overall, our findings provide evidence of improvements in financial reporting only in firms with voluntary auditor changes. This is consistent with studies in the US market (Blouin, Grein, and Rountree, 2007; Myers, Myers, and Omer, 2003). Our results do not support the call for a mandatory auditor rotation by the EU audit reform in 2016.

3.6 Conclusions

This study has investigated the role of reputation for the audit committee on auditor change using data from UK listed firms. We find that the likelihood of auditor change increases with the proportion of audit committee reputable members. Furthermore, audit committee members with a higher reputation demand for higher audit auditors. We constructed three proxies for audit quality: name-brand reputation, size and industry-specialisation. The proportion of reputable members is positively related to the commonly used measures for audit quality, except for the industry-specialisation. The results suggest that reputation plays an important role in making audit committee members work diligently to improve the quality of financial reporting by changing auditors. Higher reputable audit committee members have more reputation incentives and influence to push through the idea of changing an auditor and choosing an auditor who provides a higher audit quality to reduce the information asymmetry between the management and shareholders. Taking advantage of involuntary auditor changes among the clients of Arthur Andersen (AA), who failed in 2001, we compare the effects of voluntary and involuntary auditor changes on the absolute discretionary accruals. Consistent with the findings based on the US market (Ghosh and Moon, 2005; Myers, Myers, and Omer, 2003), only voluntary auditor changes are found to have a positive effect on earnings quality. In other words, only auditor changes initiated by the internal necessity are effective in reducing earnings management.

Our study contributes to the literature on auditor change, audit committee effectiveness, and reputation incentives in corporate governance by linking the director reputation with auditor change for the very first time. Prior studies examined the effect of audit committee composition and activities on audit-quality selection. Our examination, involving audit committee reputation, provides a clearer setting for understanding the effectiveness of the audit committee regarding auditor change. Prior research treated non-executive directors' responsibility equally, investigating how boards affect firm performance. However, whether the increase in firm value comes from board monitoring or the advisory channel is not clear. In fact, the ability and experience of individual directors on a board are diversified and they are appointed to a board to play different roles. This research directly emphasises the monitoring role of boards and tests the relationship between the effectiveness of their task and the motivation of individual directors.

The research has some important implications for regulators and policymakers. This study highlights the effect of reputation concerns (losing current/potential directorships) on motivating directors' due diligence. It calls for more regulatory guidance to clarify the authority and accountability for boards of directors. Furthermore, the question of whether mandatory auditor rotation leads to improved earnings quality is still debatable. In response to the call for a mandatory auditor rotation by the EU/UK audit reform in 2016, regulators should be cautious in their implementation. They should leave firms with enough flexibility to achieve the trade-off between agency benefits and switching costs. Our research is subject to some limitations. The findings are based on the analysis of only UK data, so cautions need to be taken to generalise the results to other markets, considering ownership structure and institutional environments.

References

Abbott, L. J. and S. Parker (2000). Auditor selection and audit committee characteristics. Auditing: A Journal of Practice & Theory, 19(2), 46–66.

Abbott, L. J., S. Parker and Peters, G. F. (2004). Audit committee characteristics and restatements. Auditing: A Journal of Practice & Theory, 23(1), 69–87.

Adams, R. B. and D. Ferreira (2008). Do director's perform for pay? *Journal of Accounting and Economics*, *46*(1), 154–171.

Adams, R. B. and D. Ferreira (2009). Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics*, *94*(2), 291–309.

Allison, P. D. (2009). *Fixed effects regression models*. SAGE.

Audousset-Coulier, S., A. Jeny, and L. Jiang (2016). The Validity of Auditor Industry Specialization Measures. *AUDITING: A Journal of Practice & Theory*, *35*(1), 139–161.

Badolato, P., M. Ege and D. C. Donelson (2013). Audit committee financial expertise an dearnings management: the role of status. *Journal of Accounting and Economics*, *58*(2–3), 71.

Baetschmann, G., K. E. Staub and R. Winkelmann (2015). Consistent estimation of the fixed effects ordered logit model Consistent estimation of the fixed effects ordered logit model. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, *178*(3), 685–703.

Balsam, S., J. Krishnan and J. S.Yang, (2003). Auditor industry specialization and earnings quality. *Auditing: a Journal of Practice & Theory*, *22*(2), 71–97.

Beattie, V. and S. Fearnley (1995). The Importance of Audit Firm Characteristics and the Drivers of Auditor Change in UK Listed Companies. *Accounting and Business Research*, *25*(100), 227–239.

Beaver, W. H. (1981). Market Efficiency. *The Accounting Review*, *56*(1), 23–37.

Beck, M. J. and E. G. Mauldin (2014). Who's really in charge? Audit committee versus CFO power and audit fees. *Accounting Review*, *89*(6), 2057–2085.

Blouin, J., B. M. Grein and B. R. Rountree, (2007). An analysis of forced auditor change: The case of former Arthur Andersen clients. *The Accounting Review*, *82*(3), 621–650.

Bruynseels, L. and E. Cardinaels (2014). The audit committee: Management watchdog or personal friend of the CEO? In *Accounting Review* (Vol. 89, pp. 113–145).

Copley, P. A., M. S. Doucet and K. M. Gaver (1994). A Simultaneous Equations Analysis of Quality Control Review Outcomes and Engagement Fees for Audits of Recipients of Federal Financial Assistance. *The Accounting Review*, *69*(1), 244–256.

Craswell, A. T., J. R. Francis and S. L. Taylor (1995). Auditor brand name reputations and industry specializations. *Journal of Accounting and Economics*, *20*(3), 297–322.

D'Aveni, R. A. (1990). Top Managerial Prestige and Organizational Bankruptcy. *Organization Science*, *1*(2), 121–142.

DeAngelo, L. E. (1981a). Auditor independence, "low balling", and disclosure regulation. *Journal of Accounting and Economics*, *3*(2), 113–127.

DeAngelo, L. E. (1981b). Auditor size and audit quality. *Journal of Accounting and Economics*, *3*(3), 183–199.

DeFond, M. L. (1992). The Association Between Changes in Client Firm Agency Costs and Auditor Switching. *Auditing: A Journal of Practice & Theory*, *11*(1), 16–31.

Defond, M. L. and K. R. Subramanyam (1998). Auditor changes and discretionary accruals. *Journal of Accounting and Economics*, *25*(1), 35–67.

DeZoort, F. T., D. R. Hermanson, D. S., Archambeault and S. A. Reed (2002). Audit committee effectiveness: a synthesis of the empirical audit committee literature. *Journal of Accounting Literature,* 21, 38–75.

Ding, R. and Y. Jia (2012). Auditor mergers, audit quality and audit fees: Evidence from the PricewaterhouseCoopers merger in the UK. *Journal of Accounting and Public Policy*, *31*(1), 69–85.

Dye, R. A. (1993). Auditing Standards, Legal Liability, and Auditor Wealth. *Journal of Political Economy*, *101*(5), 887–914.

Eisenberg, T., S. Sundgren and M. T. Wells (1998). Larger Board Size and Decreasing Firm Value in Small Firms. *Journal of Financial Economics*, *48*(1), 35–54.

Erkens, D. H. and S. E. Bonner (2013). The role of firm status in appointments of accounting financial

experts to audit committees. *Accounting Review*, *88*(1), 107-136.
Ertimur, Y., F. Ferri and D. A. Maber (2012). Reputation penalties for poor monitoring of executive pay: Evidence from option backdating. Journal of Financial Economics, 104(1), 118–144.
Fama, E. F. (1980). Agency problems and the theory of the firm. The Journal of Political Economy, 88(2), 288–307.
Fama, E. F. and M. C. Jensen (1983). Separation of ownership and control. The Journal of Law and Economics, 26(2), 301–325.
Forbes, D. P. and F. J. Milliken (1999). Cognition and corporate governance: Understanding boards of directors as strategic decision-making groups. The Academy of Mangement Review, 24(3), 489–505.
Francis, J. R. and M. D. Yu (2009). Big4 Office size and Audit Quality. Accounting Review, 84(5), 1521–1552.
Francis, J. R. and E. R. Wilson (1988). Auditor Changes: A Joint Test of Theory Relating to Agency Costs and Auditor Differentiation. Accounting Review, 63(4), 663-682.
Geiger, M. A. and K. Raghunandan (2002). Auditor tenure and audit reporting failures. Auditing: A Journal of Practice & Theory, 21(1), 67–78.
Ghafran, C., and N. O'Sullivan (2013). The governance role of audit committees: Reviewing a decade of evidence. International Journal of Management Reviews, 15(4), 381–407.
Goddard, A. R., & Masters, C. (2000). Managerial Auditing Journal Audit committees, Cadbury Code and audit fees: an empirical analysis of UK companies. Managerial Auditing Journal, 15(11), 358–371.
Guest, P. M. (2008). The determinants of board size and composition: Evidence from the UK. Journal of Corporate Finance, 14(1), 51–72.
Guest, P. M. (2009). The impact of board size on firm performance: evidence from the UK. The European Journal of Finance, 15(4), 385–404.
Hammersley, J. S., L. A. Myers and C. Shakespeare (2008). Market reactions to the disclosure of internal control weaknesses and to the characteristics of those weaknesses under section 302 of the Sarbanes Oxley Act of 2002. Review of Accounting Studies, 13(1), 141–165.
Hennes, K. M., A. J. Leone, and B. P. Miller (2014). Determinants and market consequences of auditor dismissals after accounting restatements. Accounting Review, 89(3), 1051–1082.
Hollingshead, A. B. (1975). Four Factor Index of Social Status.
Jenkins, D. S., G. D. Kane and U. Velury (2006). Earnings quality decline and the effect of industry specialist auditors: An analysis of the late 1990s. Journal of Accounting and Public Policy, 25(1), 71–90.
Jensen, M. C. and W. H. Meckling (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. Journal of Financial Economics, 3(4), 305–360.
Jiang, W., H. Wan and S. Zhao (2016). Reputation Concerns of Independent Directors: Evidence from Individual Director Voting. Review of Financial Studies, 29(3), 655–696.
Jill Treanor. (n.d.). Deloitte takes 5,000 Andersen staff. The Guardian.
Johansen, T. R. and K. Pettersson (2013). The impact of board interlocks on auditor choice and audit fees. Corporate Governance : An International Review, 21(3), 287–310.
John, K. and L. W. Senbet (1998). Corporate governance and board effectiveness. Journal of Banking & Finance, 22, 371–403.
Johnson, W. B. and T. Lys (1990). The market for audit services. Evidence from voluntary auditor changes. Journal of Accounting and Economics, 12(1–3), 281–308.
Kalbers, L. P., & Fogarty, T. J. (1993). Audit committee effectiveness - an empirical-investigation of the contribution of power. Auditing: A Journal of Practice & Theory, 12(1), 24–49.
Klein, A. (2002). Audit committee, board of director characteristics, and earnings management. Journal of Accounting and Economics, 33(3), 375–400.
Knechel, W. R., V. Naiker and G. Pacheco (2007). Does auditor industry specialization matter? Evidence from market reaction to auditor switches. *Auditing*, *26*(1), 19–45.
Krishnamurthy, S., J. Zhou and N. Zhou (2006). Auditor Reputation, Auditor Independence, and the Stock-Market Impact of Andersen's Indictment on Its Client Firms. Contemporary Accounting Research, 23(2), 465–490.
Levit, D. and N. Malenko (2016). The Labor Market for Directors, Reputational Concerns and

Externalities in Corporate Governance. The Journal of Finance, LXXI(2), 1–52.
Lin, N., J. C. Vaughn and W. M. Ensel (1981). Social Resources and Occupational Status Attainment. Social Forces, 59(4), 1163–1181.
Lorsch, J. W. and E. MacIver (1989). Pawns or Potentates: The Reality of America's Corporate Boards. Boston, MA: Harvard Business School Press.
Mangena, M., & Pike, R. (2005). financial disclosures The effect of audit committee shareholding , financial expertise and size on interim financial disclosures. Accounting and Business Research, 35(4), 327–349.
Mangena, M., & Tauringana, V. (2008). Audit committees and voluntary external auditor involvement in UK interim reporting. International Journal of Auditing, 12(1), 45–63.
Masulis, R. W. and S. Mobbs (2014). Independent director incentives: Where do talented directors spend their limited time and energy?? Journal of Financial Economics, 111(2), 406–429.
Mayhew, B. W. and M. S. Wilkins (2003). Audit firm industry specialization as a differentiation strategy: Evidence from fees charged to firms going public. Auditing.
Muravyev, A., O. Talavera and C. Weir (2016). Performance effects of appointing other firms' executive directors to corporate boards: an analysis of UK firms. Review of Quantitative Finance and Accounting, 46(1), 25–45.
Myers, J. N., Myers, L. a and Omer, T. C. (2003). Exploring the Term of the Auditor-Client Relationship and the Quality of Earnings : Quality for Mandatory Auditor Rotation? The Accounting Review, 78(3), 779–799.
Nakano, M. and P. Nguyen (2012). Board Size and Corporate Risk Taking: Further Evidence from Japan. *Corporate Governance : An International Review, 20*(4), 369–387.
Oxera. (2006). Competition and Choice in the UK audit market.
Pollock, T. G., G. Chen , E. M. Jackson and D. C. Hambrick (2010). How much prestige is enough? Assessing the value of multiple types of high-status affiliates for young firms. *Journal of Business Venturing*, *25*(1), 6–23
Reynolds, J. K. and J. R. Francis (2000). Does size matter? The influence of large clients on office-level auditor reporting decisions. *Journal of Accounting and Economics*.
Ryan, H. E. and R. A. Wiggins (2004). Who is in whose pocket? Director compensation, board independence, and barriers to effective monitoring. *Journal of Financial Economics*, *73*(3), 497–524.
Schwartz, K. B. and K. Menon (1985). Auditor Switches by Failing Firms. *The Accounting* Review, 60(2), 248–261.
Teoh, S. H. (1992). Auditor Independence, Dismissal Threats, and the Market Reaction to Auditor Switches. Journal of Accounting Research, 30(1), 1–25.
Weigelt, K. and C. Camerer (1988). Reputation and corporate strategy: A review of recent theory and applications. Strategic Management Journal, 9(5), 443–454.
Weir, C., D. Laing and P. J. McKnight (2002). Internal and External Governance Mechanisms: Their Impact on the Performance of Large UK Public Companies. Journal of Business Finance & Accounting, 29(5–6), 579–611.
Wilson, R. (1985). Reputations in games and markets. In Gametheoretic models of bargaining (Vol. 96, pp. 27–62).
Wooldridge, J. M. (2002). Econometric analysis of cross-sectional and panel data. Cambridge, MA: MIT Press.
Yermack, D. (1996). Higher market valuation of companies with a small board of directors. Journal of Financial Economics, 40(2), 185–211.
Yermack, D. (2004). Remuneration , Retention , and Reputation. The Journal of Finance, LIX(5), 2281–2308.
Zajac, E. J. and J. D. Westphal (1996). Director Reputation, CEO-Board Power, and the Dynamics of Board Interlocks. Administrative Science Quarterly, 41(3), 507–529.

Appendix A Variable definitions and summary statistics in detail.

	Definition	N	Mean	Median	Std.
Board Characteristics					
Percent reputable audit committee member	The number of reputable members over the size of audit committee	998	0.120	0.000	0.221
Indicator reputable audit committee	A dummy variable that equals one if an audit committee has at least one reputable member	998	0.286	0.000	0.452
Accounting/Financial expert	A dummy variable that equals one if at least one member in the audit committee has working experience as an accountant partner or as an CFO	998	0.405	0.000	0.491
Board Independence	The number of non-executive directors over the size of the board	998	0.559	0.571	0.147
% Audit committee to Board	The percentage of audit committee member on board	998	0.403	0.400	0.137
Log(Board_size)	The logarithm of the number of directors on board	998	2.022	2.079	0.319
Firm Features					
Leverage	Total debt over total assets	998	0.559	0.573	0.216
Account receivable	Total account receivables divided by total assets	998	0.179	0.151	0.142
Firm size	The logarithm of firms' total assets	998	11.915	11.737	1.773
ROA	Net income over total assets	998	0.050	0.066	0.156
Firm Events					
Delist	A dummy variable that equals one if a firm is delisted. Delisting reasons include takeovers (account for over 85%), foreign registration, and voluntary liquidation	998	0.049	0.000	0.215
CEO Turnover	A dummy variable that equals one if a CEO turnover occurs	998	0.150	0.000	0.357
Chair Turnover	A dummy variable that equals one if a Chairman turnover occurs	998	0.135	0.000	0.341
Discretionary accruals					
DACC	The DACCs (discretionary accruals) are the absolute value of the regression residual by estimating a performance-adjusted modified Jones model (see Appendix B)	998	0.059	0.049	0.094

Appendix B DACC Estimation

Accounting literature often uses discretionary accruals as an applicable proxy for earnings quality/management (Dechow, Sloan, and Sweeney, 1995; Kim, Park, and Wier, 2012). This is because manipulating earnings with accruals is a key approach for earnings management. Discretionary accruals reflect the extent to which managers are tolerable to "adjusting" accruals, highly related to manipulating earnings. Following Dechow et al. (1995), we measure non-discretionary accruals using the cross-sectional industry variation of a performance-adjusted modified Jones model.

It is expected that non-discretionary accruals occur in the normal business transactions, no matter whether earnings-management happens, and is highly related to a firm's economic characteristics. Consequently, non-discretionary accruals should be estimated by a function of firm's revenues, account receivables, operation cash flow, the level of property, plants and equipment and firm performance. Then, estimations are adjusted for industry and time effects. Lastly, discretionary accruals are equal to the difference between total accruals and the estimation of non-discretionary accruals. The DACC (discretionary accruals) are the absolute value of the residuals in the following model:

$$\frac{TACC_{ij,t}}{TA_{ij,t-1}} = \beta_{1j,t}\left(\frac{1}{TA_{ij,t-1}}\right) + \beta_{2j,t}\left(\frac{\Delta Revenue_{ij,t} - \Delta Receivables_{ij,t}}{TA_{ij,t-1}}\right) + \beta_{3j,t}\left(\frac{PPE_{ij,t}}{TA_{ij,t-1}}\right) + \beta_{4j,t}\left(\frac{Net\ income_{ij,t}}{TA_{ij,t-1}}\right) + \varepsilon_{ij,t}$$

where $TACC_{ij,t}$ is the total accruals (net income from continuing operations minus operating cash flows) for firm i in industry j for year t. $TA_{ij,t-1}$is the total assets for firm i in industry j for year t-1. $\Delta Revenue_{ij,t}$ is the revenue difference of current year and one lagged year for firm i in industry j. $\Delta Receivables_{ij,t}$ is the accounts receivable change previous year. $PPE_{ij,t}$ is the gross property, plant, and equipment for firm i in industry j. $\varepsilon_{ij,t}$ is the residual from regression for firm i in industry j for year t. DACC is measured as the absolute value of $\varepsilon_{ij,t}$, reflecting the magnitudes of abnormal accruals, consistent with empirical studies (Jenkins, Kane, and Velury, 2006; Lennox, Wu, and Zhang, 2015). The larger size of DACC signifies lower earnings quality.

Chapter 3: Board Meeting Frequencies on Various Topics and Corporate Governance: Evidence from China

Abstract

The paper examines the relationship between numbers of topic-specific board meetings and efficiency of corporate governance. Quality of corporate governance is proxied by CEO turnover-performance and compensation-performance sensitivities. The measures of numbers of topics-specific meeting are calculated based on the reports of independent directors of Chinese listed firms over the period of 2005 to 2015. We document that directors meet more often to discuss growth strategies for the use of IPO proceeds, investment and acquisitions can increase the CEO compensation-performance sensitivity. Moreover, more discussing the nomination of directors and top management decrease the sensitivities of CEO turnover and compensation to performance. It sheds light on what makes boards more effective, and how board monitoring of different decisions at board meetings modifies the connection between CEO interests and firm performance.

JEL classification: G30; G34
Keywords: Board Effectiveness, Board Meeting Topics, Agency Costs, CEO Compensation, CEO Dismissal

2.1 Introduction

A growing body of corporate governance literature focuses on the duties and functions of boards of directors who play an important role in corporate governance to mitigate agency problems. Without boards' monitoring, management teams may take self-benefit actions, and deviate from the interests of residual claimants (Fama and Jensen, 1983a,b; Jensen and Meckling, 1976). Particularly, the intensity of board activities is believed to be beneficial to firms, at least from regulators' point for view. Since introduction of the Sarbanes–Oxley Act (2002) in the US, a minimum number of board meetings has been required in many markets (e.g., U.K. and India). In addition, the actual number of board meetings has to be disclosed in listed firms' annual reports. One question that needs to be asked, however, is how board activity influence corporate governance.

Numerous empirical studies of board function use number of board meetings to proxy for board monitoring intensity (e.g. Adams and Ferreira, 2009; Dou, Sahgal, and Zhang, 2015; Goergen, Limbach, and Scholz, 2015). Directors who meet more frequently are more likely to spend more time in the served firm and carry out their duties (Lipton and Lorsch, 1992). Vafeas (1999) and Brick and Chidambaran (2010) find that the meeting frequency has a positive impact on firm value. On the other hand, Jensen (1993) point out that inefficient routine meetings could be held primarily to satisfy the requirements of firm hierarchy and regulation. Some studies shows that more board meetings and higher director attendance in the meetings do not effectively prevent management's opportunistic behaviours (e.g. Lo, Wong, and Firth, 2010).

One of the limitations with previous research is that it fails to consider that board meetings contain various components. Different proposals typically initiated by the management have to be discussed to obtain ratifications from directors. Boards of directors put most of their effort

into monitoring sundry management decisions: business strategy, risk oversight, board composition and CEO succession planning (e.g. Schwartz-Ziv and Weisbach, 2013; Stiles, 2001).[1] Board activities related to processing corporate decisions are more effective to demonstrate how directors fulfil their monitoring obligations, ruling out the noise from routine meetings. Indeed, meetings on different topics provide various means to re-evaluate CEO and firm performance in corresponding dimensions. To shed light on importance of board meeting agenda, we use the number and type of meetings to proxy for board activities to monitor various proposals. This approach allows us to investigate how board meetings on specific topics affect quality of corporate governance.

Quality of corporate governance is measured by two proxies, namely turnover-performance and compensation-performance sensitivities. Boards of directors are in charge of monetary incentives and the threat of dismissal, keeping managers on their toes by aligning managerial benefits with the firm's interests (Tirole, 2001). Board meetings provide a chance for directors to monitor and discuss strategies to improve firm's and the executives' performance (e.g. Forbes and Milliken, 1999). Agency models prescribe normative actions so that compensation is related to effort and performance and that the board fires poor performing CEOs. However, some empirical research might find the opposite effect.[2]

---

[1] Schwartz-Ziv and Weisbach (2013) examine the managerial and supervisory theories of board effectiveness, using private data obtained by inspecting the minutes of real-world board meetings in 11 Israeli business companies during 2007-2009, including 155 board meetings, 247 board committee meetings, and 2,459 decisions made. Stiles (2001) tests these two theories by analysing data from 51 interviews with directors of UK public firms, 121 board secretaries and 4 case studies of UK public firms.

[2] In pay-firm performance literature, this is no such simple relationship in reality: many studies have found a negative relationship between excess compensation and firm performance (e.g. Brick, Palmon, and Wald, 2006); the CEO pay-performance sensitivity was mainly dependent on firm's reward to the top management team(e.g. Carpenter and Sanders, 2002).

China provides us with a unique framework for looking at the missing relationships between board activities and the reduction of agency costs. The internal governance system is endogenously determined based on firm's contracting and operating environments (Hermalin and Weisbach, 2003). Hence, no clear evidence in the U.S. supports boards work actively to protect the investors' interests. Like other emerging markets, the legal protection for investor rights and accounting standards in China are less-developed than ones in the U.S. Studies that use data of these markets often document a positive association between board effectiveness and firm performance. It suggests that the internal governance mechanisms are a possible substitution for external mechanisms in these countries (e.g. Ferreira and Matos, 2008), and become more consequential as well.

To offset the defect of external governance mechanisms for Chinese listed firms, the China Securities Regulatory Commission (CSRC) emphasises the monitoring role of independent director system from 2001. CSRC also introduced a practice[3] that differs from those adopted in developed markets. That is, independent directors are obliged to issue *Report[s] of the Independent Director* after meetings, in order to publicly release topics discussed and their opinions on important board decisions. Many empirical research focusing on board characteristics in China documents that board of director is an important corporate governance mechanism regardless their ownership structure (Chen, Firth, Gao, and Rui, 2006; Kato and Long, 2006a; Liu et al., 2015).

The reports are a novel way to enrich corporate disclosure and board accountability in decision making. The CSRC and new Corporate Law require reports to be independent and objective. Using listed firms' reports, we capture independent directors' task-based activities

[3] The new corporate governance guidelines for Chinese listed firms (2001, 2002).

on six major topics, explicitly personnel changes, compensation, financial reports and audit, firm control transactions, changes of equity structure, and growth strategies.

We apply panel data techniques to explore the moderating effects of specific topics discussed at board meetings on the sensitivity between CEOs' dismissal/compensation and firm performance. Furthermore, we extend our analysis by employing the instrumental variable (IV) and generalized method of moments (*GMM*) approaches to mitigate endogeneity issues. Our key findings show that CEO dismissals and compensation are related to firm performance in China, suggesting that boards of directors are effective, at least to some extent, in contracting and monitoring executives. Regarding CEO compensation and its relationship to firm performance, the pay-performance sensitivity is strengthened by additional board monitoring efforts in discussions of firms' growth strategies (i.e. investments and acquisitions). The relationship between CEO dismissal and firm performance is weaker when there is more board monitoring activity on the nomination of directors and top management.

Next, we investigate whether effects of board activities vary under different ownership structures. The majority of China's listed firms are privatised former state-owned enterprises with very unique ownership structures. They are controlled by either state owners or legal person owners (private firms). We find that the mediation effect of nomination meetings is positive and significant in private firms but insignificant in state-controlled firms. Further, the mediation effect of growth strategy meetings is stronger in private firms than that in state-owner firms. The results reflect the divergence of primary motives of the controlling owners. State owners have political and economic considerations, while legal person owners are mainly profit-driven (Chen, Firth, Gao, and Rui, 2006).

Our research contributes to the literature in the following ways. First, we contribute to the literature that examines board effectiveness and influence upon firm performance. Most studies in the field of board effectiveness have only focused on board characteristics, and draw

inferences that board characteristics could affect their activities, and ultimately impact firm value. However, few writers have been able to draw on any systematic research into board activities on different topics affects the practice of corporate governance. We show that board activities related to different strategic decisions can alter the relationship between CEO interests and firm performance.

Second, we contribute to the dynamic debate among academics and practitioners as to whether board meetings are meaningful. This study provides novel empirical evidence on linking boards' decision performance with governance at the firm level. Moderately consistent with the prediction of the board process model that board task performance can improve firm performance (Forbes and Milliken, 1999), some meetings have positive effects on corporate governance, although meetings with different foci have different effects. We also avoid the noise present in the annual meeting frequency measure used in previous empirical studies (Brick and Chidambaran, 2010; Vafeas, 1999).

Last but not least, we extend the literature on the endeavor to achieve better corporate governance in a major emerging economy. In an environment with weak investor protection, centralized ownership, and an ineffective takeover market, the heavy burden of solving agency problems in China lies on the shoulders of directors, and mainly independent directors. We provide novel evidence on the effectiveness of the recently adopted independent director system and their reports, whereas prior studies only address inferences about board composition and structure. Our findings call for policies that encourage directors to put more effort into monitoring firms' strategic decisions and the link between CEO incentives and firm performance, instead of focusing on the number of board meetings alone.

The remainder of the paper proceeds as follows. In the next section, we provide the institutional background and literature review. The following two sections describe the sample

data and explain the research design. The penultimate section contains the empirical results and discussion. The final section presents our conclusions and discusses areas for further study.

2.2 Literature review

2.2.1 Institutional Background and Corporate Governance in China

China's economic reform began with the study of the modern corporate governance system of western countries. In 1992, China introduced Germany's two-tier board system, consisting of a main board and a supervisory board. In most stated-owned enterprises (SOEs), the government had a significant impact on the nominations and appointments for both boards. The top management of firms worked as bureaucrats, and the supervisory boards had little motivation and ambiguous accountability when it came to monitoring managers and firm operations (Allen et al., 2005; Conyon and He, 2011).

In order to deepen the economic reforms and protect the interests of minority shareholders, the CSRC mimicked the Sarbanes-Oxley Act in adopting new corporate governance mechanisms from 2001 onwards. It issued guidelines and regulations (2001, 2002) that compelled each listed firm to have independent directors on its main board and to improve the quality of its information disclosure. The proportion of independent directors was required to be at least one third by June 2003, while independent directors were required to publish the *Report of the Independent Director* after board meetings (CSRC, 2001). As a result, the protection of public shareholder interests and the transparency of information disclosure have been improved (CSRC, 2004).

One year later, the independent directors' system gained legal status for the first time, when it was authorized in the new Company Law of China (2005). Independent directors, as a group

of corporate agents, are not affiliated with the listed firm or the controlling shareholders, and 'shall be especially concerned with protecting the interests of minority shareholders from being infringed' (CSRC, 2002). Furthermore, they are legally liable for disclosing fraud and irregularities of listed firms through the *Report of the Independent Director*. The report must clearly state whether each independent director agrees with important managerial proposals discussed in the board meeting. Specifically, it is mandatory that they report how they voted on different types of firm decision (CSRC, 2001).

These reports provide a unique dataset from China to study corporate boards that are typically black boxes. From the dissent votes of these report, recent studies show that independent directors' dissent is a valid signal of the presence of effective corporate governance. Dissension is eventually rewarded in the marketplace in the form of more outside directorships and a lower risk of regulatory sanctions (Jiang, Wan, and Zhao, 2016; Ma and Khanna, 2016; Tang, Du, and Hou, 2013). The reports could be seen as an intense reflection of board monitoring by the independent directors.

2.2.2 CEO Dismissal, Compensation, Performance, and Boards

The board of directors, the "ultimate internal monitor", plays an important role in evaluating CEOs and disciplining them (Fama, 1980). The board is responsible for designing a compensation contract that will motivate the CEO, rewarding acceptable firm performance, and punishing (and in extreme cases, dismissing) the CEO for poor performance. Research on the subject has been mostly restricted to investigate how board composition and features influence the relationships between CEO rewards and firm performance. These characteristics include independent director composition (Dah, Frye, & Hurst, 2014; Guthrie, Sokolowsky, & Wan, 2012; Weisbach, 1988), board size (Coles, Daniel, & Naveen, 2008; Yermack, 1996),

CEO-chairman duality (Goyal and Park, 2002; Ryan and Wiggins, 2004), female and minority-group directors on the board (Adams and Ferreira, 2009; Carter, 2010), reputation (e.g. Shivdasani, 1993), and work background (e.g. for academia experience see Francis, Hasan, and Wu, 2015) of board members.

The literature typically documents that CEO dismissal (compensation) is negatively (positively) related to firm performance (e.g. Core, Holthausen, and Larcker, 1999; Defond and Hung, 2004; Denis and Denis, 1995; Kaplan and Minton, 2012). However, the pay/dismissal-to-performance sensitivity can in practice be weakened or eliminated by competition from the CEO's peers within the top management team, board characteristics, ownership structure (e.g. Agrawal and Knoeber, 1996; Gillan and Starks, 2003), institutional environments (e.g. Shleifer and Vishny, 1997), and even exogenous industry and market shocks (e.g. Jenter and Kanaan, 2015).

Jensen and Murphy (1990) argue that the associations between CEO monetary incentives or dismissal and performance are statistically significant, but they may be economically too small to actually discipline CEO's behaviours. They also hypothesize that public and private political forces impose constraints on incentives, which weaken the relationships. Recently, Kaplan and Minton (2012) found that annual CEO turnover-performance sensitivity was higher for the period after the Sarbanes-Oxley Act (2000-2007) than estimated in previous studies.

In summary, the evidence presented thus supports the idea that board composition could potentially affecting the way board operates, then affect firm level outcome. Our study provides new systematic evidence on how various types of board activities on different proposals directly affect quality of corporate governance.

2.2.3 Board of non-executive director and CEO Dismissal, Compensation in China

One increase concern in China's context is entrenched managers: whether internal corporate governance mechanisms work to dismiss underperformed CEOs who are often affiliated with the controlling shareholders). In SOEs, one scenario is that independent directors are representatives of the controlling shareholders (government or government agents) (Firth, Fung, and Rui, 2006). Firm profitability is not the only goal of controlling shareholders, so independent directors will not dismiss CEO in poor performed firms. It is in line with controlling shareholders' interests, while conflicting with minority shareholders' interests. The other scenario is that independent directors (political connected directors) are not independent, because they have more career concerns in political related markets rather than in the professional manager pool. In non-SOEs, the managers (Chairmen) are often the controlling shareholders themselves. Hence, it is almost impossible to replace the entrench managers. Since the early 2000s China's public firms have been under pressure from investors to reform (Allen et al., 2005), the institutional context may change. New empirical studies are needs to investigate the whether independent directors could play the effective discipline role.

The empirical literature on CEO dismissal and compensation in China mostly shows that both the turnover-performance and compensation-performance relationships are statistically significant (e.g. Bai and Xu, 2005; Conyon and He, 2011, 2014; Firth, Fung, and Rui, 2006; Kato and Long, 2006b). However, the statistical significance and magnitude of the coefficients may vary, depending on which performance measures are used.

Empirical research documents mixed results of the influence of outside director on top executive turnover. In addition, they often measure board independence by the ratio of independent directors on board, and test whether board independence enhance the CEO turnover-performance sensitivity. Kato and Long (2006) find that the presence of independent

directors will enhance turnover- performance link using data on China's listed firms from 1999 to 2002. Conyon and He (2011) argue that that non-State (private) controlled firms and firms with more independent directors on the board are more likely to replace the CEO for poor performance from 2001 to 2005. In contrast, Firth, Fung, and Rui (2006) show that the turnover-performance sensitivity is lower if more independent directors on board. Furthermore, CEO turnover are more likely to associate with accounting performance, not with market-based performance (Conyon and He, 2014).

Some studies also examine the sensitivity of CEO compensation to firm performance as a complementary reward mechenisam to dismissal threat. Firth, Fung, and Rui (2007) using data on 1998 to 2000 find that CEO compensation in China are more likely to link to firm accounting performance (ROA) rather than market performance. State ownership reducs compensation-for-performance sensitivity. Firms with a lot of non-executive directors are more likely to use performance-based pay, and a firm that has a joint CEO/chairman position is less likely to use performance-based pay. Conyon and He (2011) find that firms with more independent directors on the board have a higher pay-for-performance link from 2001 to 2005.

In summary, previous empirical studies often use board composition (the ratio of independent director, political connected director etc.) to measure internal governance quality with short panel data.

2.2.4 Topic-Focused Board Meetings and Corporate Governance

On one hand, board meeting are the most usual occasion for the board of directors to exchange and discuss ideas in order to fulfil their responsibilities (Conger et al., 1998). Interactions and communications in board meeting can increase the efficiency with which boar tasks are performed (Forbes and Milliken, 1999). From this point of view, the more frequent the

meetings, the better monitoring and control which lead to better corporate governance outcome. On the other hand, the meeting of the boards are not all synonymous with efficiency. Some routine tasks fixed by the CEO might take up a larger portion of the time. Thus, more meetings don't necessarily imply better monitoring. Previous studies on board meetings most often depict board meetings as rather homogeneous and monolithic. They find that poor performance cause a higher frequency of board meetings, while number of board meetings have no effects on CEO turnover/compensation performance sensitivities (Adams, 2005; Brick and Chidambaran, 2010; Vafeas, 1999). However, not all meetings are the same. Recent studies have shown significant variations in the ways in which board meetings are run. Ocasio and Joseph (2005) suggest that the topics on which boards focus, and even the board routines, can vary remarkably between corporations, with the micro-processes and topics covered potentially revealing large differences between boards. Therefore, it's important to investigate specific topics discussed at board meetings as well as the ways they influence corporate governance efficiency.

2.3 Data and Summary Statistics

We perform our analysis on a sample of non-financial firms listed on the Main Boards of the Shanghai and Shenzhen Stock Exchanges over the period of 2005-2015. We obtained other financial and corporate governance information from the CSMAR. We applied a number of screening procedures to our initial dataset. First, we excluded financial firms, because their regulations and accounting standards are dissimilar to those for other firms. Second, we only included those firms with at least three consecutive fiscal years of capital market and financial statement data. Third, to alleviate the influence of extreme values, all firm-level financial data

were winsorized at the top and bottom 1%. This screening process yielded 10,239 firm-year observations over seven years.

The public release of *Report of the Independent Director* began in 2001, and became compulsory in 2003. During 2003-2005, the reports were issued by listed firms 'voluntarily' as the CSRC requirements for issuing such reports were not explicit. The Information Disclosure Standards (CSRC, 2005) further clarified the disclosure requirements, improving the quality and quantity of the reports. After 2005, the number of independent directors' reports increased accordingly. For each report, the CSMAR recodes the firm's stock code, the issuing date, the topics discussed, the independent directors' opinions, and the entire contents of the report (see Appendix A for an example of an independent directors' report).

Due to the difficulty to access corporate boards, there is no empirical research with large samples, which could provide evidence of what topics are important and useful to improve corporate governance. The unique practice of the *Report of the Independent Director* in China provides a large dataset about board meeting topics. There is often more than one topic discussed at a board meeting. We use the frequency with which a topic is discussed at board meetings, over a year, as the proxy for board monitoring activity on this particular topic.

The column 1 of Table 1 shows mandatory disclosure subjects in the reports recorded in the China Stock Market & Accounting Research (*CSMAR*) Database. Based on the content and roles of these topics in corporate governance, we group them into six major topics (Column 2 of Table 1).[4]

[4] Tang et al. (2013) use similar categorization of topics to compose major topics. We also estimate using meeting number of eleven groups in robustness tests. Our main results are unchanged.

2.3.1 Types of board meetings

Nomination. A role typically associated with the board of directors is control of the process by which top executives are hired, promoted, assessed and dismissed if necessary. Nomination decisions of board members and top management may also reflect the dynamics of CEO and the board power. If the board is weak, the CEO turnover and salary might not be significantly related to firm performance (Boyd, 1994; Weisbach, 1988). Shivdasani and Yermack (1999) find that CEO involvement in the selection of directors is a mechanism used by CEOs to reduce the monitoring from the board.

Compensation. The board is also responsible for keeping the levels of remuneration sufficient to attract, retain and motivate directors. Empirical studies often state a weak or insignificant association between CEO compensation and firm performance (e.g. Core et al., 1999). Although boards of directors are supposed to monitor the excess compensation of executives, they hardly to confront management except when it comes to fire management. Brick, Palmon, and Wald (2006) find that a significant positive relationship between CEO and director compensation. They also find evidence that excess compensation (both directors and CEO) is associated with firm underperformance, indicating mutual back scratching or cronyism of CEO and directors.

Financial reports, audit and corporate control. The board of directors are also responsible for oversight internal control, approval of financial statements and report to the shareholders. The "financial reports and audit" topic includes meetings on issuing/amending annual reports, auditors' reports and auditor changes. "Corporate control transactions" involves related-party transactions, loan guarantees, and the disposal of assets. These transactions may be associated with a manager's or controlling blockholder's "tunneling or propping" behaviour which can harm shareholders' interest (e.g. Peng, Wei, and Yang, 2011). Board meetings on these topics

help the board fulfil their disciplinary role to reduce the probability of financial frauds and managers' tunnelling behaviour.

Table 1
Specific Topics of Board Meetings in Chinese Public Firms. This table reports the specific major topics discussed in the board meetings of Chinese listed firms. The eleven categories (by CSMAR code) of meetings are based on the *Code of Corporate Governance* in China (2001). We combine some topics as they have similar effects.

Major topics	CSMAR code (According to CSRC requirements)	Notes
Nomination	Personnel – 1	Director and officer selection, appointment, and turnover
Compensation	Compensation - 2	Emolument of directors and executives
Financial reports and audit	Financial report and pay out policies - 3 Audit - 7	Approval of financial reports, profit distribution, amendments and supplements of reports, etc; switches of auditors, audit opinion; accounting treatment and information disclosure
Corporate control transactions	Related-party transaction - 4 Loans Guarantees - 5 Disposal of assets - 10	Loan guarantees are promises by the listed firm (the guarantor) to assume the debt obligation of a borrower if that borrower defaults; disposal of assets means the gain or loss calculated as the net disposal proceeds, minus the asset's carrying value.
Change of equity structure	Ownership changes - 8 Equity division reform - 11	
Growth strategies	Mergers and acquisitions - 6 Use of IPO proceeds and financing - 9	

Growth strategies. Setting strategic direction of the company is another role the board serves (Demb and Neubauer, 1992). The board make decision about issues that are critical and strategic such as acquiring a new firm, divesting a division or negotiating a takeover bid (Baysinger and Bulter, 1985; Zahra and Pearce, 1989; Minichilli et al., 2009). Meetings on growth strategies include the use of IPO proceeds, investments and acquisitions, investment

and financing. Meetings on growth strategies enables boards of directors to re-evaluate CEO capability and firm fundamentals.

Change of equity structure. Our sample period coincides with the split-share-structure reform in China. Prior to 2005, listed firms in China were characterised by a split share structure where two thirds of the state-owned shares are not tradable. These non-tradable shares are largely blamed for some serious corporate governance issues and lack of incentives and manger responsibilities under the state-ownership structure. In April 2005, the CSRC initiated the split-share-structure reform, which enabled state shareholders of listed firms to trade their restricted shares. The meeting decisions may influence a firm's ownership structure, and eventually cause a change in corporate governance mechanisms (e.g. Cao, Pan, and Tian, 2011).

2.3.2 Key variables

CEO Dismissal. The top executive in a Chinese firm is often the chairman (or general manager) of the board, who is the legal representative of the firm, works full time, and is involved in the firm's daily decision making (e.g. Conyon and He, 2011; Kato and Long, 2006a). Consistent with previous studies, we adopt the title of CEO for the top executive to avoid confusion. CEO dismissal is coded as a dichotomous variable, which equals one if a CEO is forcefully dismissed, and zero otherwise. We exclude voluntary turnovers because of health issues or retirement, based on public information (recorded in the CSMAR dataset), retaining only the forced ones, in line with previous studies (e.g., Chang and Wong, 2009; You and Du, 2012).

During our sample period, we identify 2,556 forced CEO dismissals among the 14,359 firm-year observations (Panel A of Table 2). If a firm has two or more turnovers in one fiscal year, we only count the last one. The likelihood of forced CEO turnover is approximately 18%,

implying an average CEO tenure of less than five years, which is consistent with the study of Conyon and He (2014) and similar to the turnover rate in the US (Kaplan and Minton, 2012).

CEO Compensation. Executive compensation schemes in China typically include only cash salaries, bonuses, and stipends. Although stock options have been permitted by the CSRC since 2005, their adoption in equity compensation is rare: only 1.5% of CEOs received equity grants in 2005, climbing to 3.5% in 2010 (Conyon and He, 2012). Empirical studies estimate that Chinese executives may receive "perks" from their companies, accounting for approximately 15-32% of total compensation, but they are rarely disclosed in financial reports and difficult to assess using public data. Hence, compensation in this study is the reported sum of cash salaries, bonuses, and stipends. The CEO compensation is measured as the average compensation of the three highest-paid management executives and directors in a firm, consistent with prior research (see e.g. Conyon and He, 2012).

Panel A of Table 2 shows that executive compensation has risen rapidly. The amount paid in 2015, of about 802,000 RMB (116,500USD), was triple that in 2005 (230,000 RMB / 33,400 USD). Although the executive compensation is not as high as that in the US, it is ten times the average wage of employees in the same industry, according to the National Bureau of Statistics of China[5].

[5] http://data.stats.gov.cn/workspace/index?m=hgnd

Table 2

CEO Dismissal, Compensation and Board Meetings. This table reports the rate of CEO dismissal, the executive compensation (the average of the three highest-paid executives' compensation), the annual number of board meetings, and the frequencies of board meetings on major topics, in Chinese public firms from 2005 to 2015. In panel A, the CEO dismissals rate refers to the percentage of CEO replacements in the single year in question. Executive compensation (000s RMB) is the average compensation of the three highest-paid executives and directors, including basic salary, bonuses, and other benefits. Annual number of board meetings expresses the average frequency of board meetings. Panel B shows the frequencies of meetings on the six major topics individually: nomination, compensation, management routines, corporate control transaction, change of equity structure, and growth strategies.

A) Annual CEO dismissal rate, executive compensation and board meeting frequency

Year	Observations	CEO dismissal	Compensation (RMB 000 s)	Annual meeting frequency
2005	1245	0.189	230.904	7.504
2006	1272	0.189	259.874	8.227
2007	1247	0.167	357.544	9.874
2008	1249	0.166	397.479	9.768
2009	1255	0.163	440.288	8.712
2010	1307	0.176	524.065	9.010
2011	1334	0.164	598.143	9.388
2012	1354	0.140	637.598	9.806
2013	1352	0.182	684.047	9.158
2014	1367	0.200	738.408	9.703
2015	1368	0.219	802.093	10.711
Total	14359	0.178	528.059	9.277

B) Meeting frequencies on major topics

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Nomination	1397	450	512	695	687	1169	1223	1312	1716	2061	2305
Compensation	96	45	35	103	95	255	316	344	548	688	915
Financial reports and audit	355	296	186	147	232	369	374	643	808	1202	1418
Corporate control transactions	1381	1337	1531	1815	1834	2293	2142	2818	3138	3240	3502
Change of equity structure	180	1055	121	63	58	37	11	38	20	8	26
Growth strategies	119	106	147	209	294	303	474	466	696	817	1342

Topic-Focused Meetings. Panel B of Table 2 documents the meeting frequencies for each specific topic. Although the annual number of meetings does not change much (about eight or ten meetings per year, see last column of Table 2 panel A), the topics discussed at the meetings show significant variation. Since 2005, proposals of firm control transactions (e.g. related-party transactions) have been the most frequently discussed topic, almost once or twice per year per firm (over 1,300 times across the 1,200 or so firms). The nomination of directors and executives is the second most frequent, about once per years per firm. The number of meetings about compensation changes increases from 96 in 2005 to 915 in 2015, which is in line with the rapid increase in executive compensation over that period. The frequency of meetings on changes in equity structure is likely influenced by government policy. In 2005, the CSRC instigated a split-share-structure reform, setting a deadline for the end of 2006. As most of the equity structure changes were related to non-tradable shares owned by SOEs or government agencies being transferred to tradable shares, the frequency of meetings on equity structure changes peaked at 1,055 in the year 2006.

Firm performance measures. Our primary measure of performance are return on assets (ROA). We also use other two accounting performance measures, return on equity (ROE) and profit margin (sales profit/ sales income), in robust tests. Although stock return and Tobin's Q, market based performance measures, are widely used in literature on developed markets, they are not considered a proper performance measure for Chinese listed firms. Most Chinese listed firms originated from state-owned enterprises (SOEs) with majority shares not tradable in the secondary market. The non-tradable shareholders, mainly governments or state-owned legal persons, typically acquire their shares of stocks at prices significantly lower than the initial public offering prices. Since there are big pricing gaps between tradable and non-tradable shares, Tobin's Q would not correctly reflect firm financial performances or firm values. In

addition, Chinese stock markets are highly speculative and share prices bear little relationship to their fundamental values (e.g. Bai, Liu, Lu, Song, and Zhang, 2004).

Measures of control variables. Following the recent corporate board literature (Conyon and He, 2011b; You and Du, 2012), we group the vector of control variables into three categories. The category of board feature variables contains the percentage of independent directors (Independent directors %), the number of board directors (board size), and a dummy variable (Duality) which equals 1 when the chief executive officer (CEO) and the board chair are the same person. The group of ownership structure variables includes shares held by largest shareholders (Largest shareholding), *Ownership Concentration* index, a *State-owned enterprises* dummy variable taking a value of 1 if the firm is controlled by a mother SOE or government agency. To control for firm characteristics, we include the natural log of firm total assets (Log(firm size)), the logarithm of the number of employees (Log(employees)), and the book value of debt divided by total assets (Leverage). We also control CEO age (Age) and gender (Female) in the estimation of CEO dismissal. A set of year dummies is included to control for macro-economic shocks, and industry dummies based on the CSRC's code.

TABLE 3
Descriptive Statistics for Main Independent Variables

	Definition	Mean	Median	STDEV	the 25th percentile	the 75th percentile	N
ROA	Net profit divided by total assets	0.039	0.040	0.058	0.021	0.065	14359
Age	CEO age	51.515	51.000	6.999	47.000	56.000	12490
Female	A dummy variable equals one if CEO is female	0.036	0.000	0.186	0.000	0.000	14359
Board size	Logarithm of number of directors	9.194	9.000	1.928	8.000	10.000	14246
Duality	An indicator equals one if the same person acts as CEO and chairman, and zero otherwise	0.139	0.000	0.346	0.000	0.000	13645
Independent directors %	Fraction of independent directors on board	0.365	0.333	0.053	0.333	0.375	14246
Largest shareholding%	Shares held by largest shareholders	31.692	29.445	17.625	17.718	44.050	13577
State-owned enterprises	Dummy equals one if the firm is controlled by the state or government agencies, and zero otherwise	0.656	1.000	0.475	0.000	1.000	14359
Ownership Concentration	Herfindahl_index - Sum of squares of shareholding percentage of top five shareholders	0.175	0.141	0.128	0.073	0.252	14359
Leverage	Total liability over total assets	21.983	21.870	1.410	21.032	22.804	14359
Log(firm size)	Log value of firm's total assets	7.614	7.690	1.527	6.774	8.559	14315
Log(employees)	Logarithm of number of employees in the firm	0.039	0.040	0.058	0.021	0.065	14359

2.3.3 Summary Statistics

Table 3 presents the descriptive statistics of the main independent variables. About 65.6% of the listed companies in our sample are SOEs. The average ROA is about 3.9% which is consistent with prior research (Conyon and He, 2011, 2012; Kato and Long, 2006a). The average number of board members is 9.19 and independent directors make up 3.7% of them (the legal requirement has been one third since 2003). About 12% of firms have a CEO with dual leadership roles. The pairwise correlations between the variables are provided in Appendix B. There are only modest correlations among the independent variables. The values of the variance inflation factors (VIFs) range from 1.02 to 1.86, and all the values are strictly less than 3, indicating that the regression analysis is free from multicollinearity problems (Greene, 2003).

2.4 Research methodology

To examine the impact of topic-focused meetings on the sensitivity of CEO dismissal to firm performance, we estimate six series of panel data logistic regressions, for firm i in year t:

$$Probability\ (Dismissal_{it}) = f(Performance_{it-1},\ Topic\ focused\ meeting\ frequency_{\ it-1},$$
$$Performance_{it-1} \times Topic\ focused\ meeting\ frequency_{\ it-1}, Control\ varibales_{it-1}) \quad (1)$$

To test the effect of topic-focused meetings on the correlation between compensation and performance, we estimate six series of linear regression models using fixed effects:

$$Compensation_{it} = f(Performance_{it-1},\ Topic\ focused\ meeting\ frequency_{\ it-1},$$
$$Performance_{it-1} \times Topic\ focused\ meeting\ frequency_{\ it-1}, Control\ varibales_{it-1}) \quad (2)$$

Fixed effects estimators can help to control the heteroscedasticity and endogeneity issues caused by unobserved firm-specific influences or measuring errors in regressions. In order to examine whether the holding of topic-focused meetings has an impact on performance-related CEO dismissal and compensation, we include interaction effects of the frequencies of meetings

on the six major topics individually. In other words, for each type of meeting, we take $topic\ focused\ meeting\ frequency_{\ it-1}$ and the interaction term $Performance_{it-1} \times topic\ focused\ meeting\ frequency_{\ it-1}$ in the regression models. The method of interaction terms is commonly applied in economics and finance research (e.g. Firth et al., 2006; Kato and Long, 2006b; Weisbach, 1988; You and Du, 2012). A positive (negative) value for the effect of the interaction term would imply that the higher was the frequency with which topics were discussed at board meetings, the greater would be the sensitivity between performance and CEO compensation (turnover).

We can also partly mitigate the endogeneity issue by using lagged values of all independent variables to facilitate causality. See the section on robustness checks for further considerations of the endogeneity issues (IV and GMM method).

2.5 Do Topic-Focused Board Meetings Affect Quality of Corporate Governance

2.5.1 CEO Dismissal, Firm Performance, and Topic-Focused Board Meetings

In this section, we examine whether the frequencies of topic-focused board meetings affect the CEO turnover-performance sensitivity. The dependent variable is set to one if the CEO has been dismissed and zero otherwise. Table 4 presents the results of the logistic regressions with fixed effects based on equation (1)[1], with firm performance measured using ROA.

[1] We also estimate equation (1) using fix effects and main results are consistent with the ones using random effects.

TABEL 4

The Effects of Meetings on the Six Major Topics, on the sensitivity of CEO Dismissals to firm Performance. This table presents series of logistic regressions with fix effects. CEO dismissal is the dependent variable, which equals one if the CEO is dismissed, and zero otherwise. Firm performance is measured by ROA. Nominations, compensation, management routines, firm control transactions, changes of equity structure and growth strategies are the major topics discussed. Topic-focused meeting frequency is the annual meeting frequency for each topic. The interaction terms between firm performance and topic-focused meeting frequency capture the meetings' moderate effects on the relationship between CEO dismissal and firm performance. Other variable definitions are provided in

CEO dismissal	1 Nomination	2 Compen- sation	3 Financial reports and audit	4 Corporate control transactions	5 Change of equity structure	6 Growth strategies
ROA_{t-1}	-3.280***	-2.281***	-2.284***	-2.036***	-2.561***	-2.668***
	(0.706)	(0.614)	(0.673)	(0.753)	(0.611)	(0.620)
Topic-focused meeting frequency $_{t-1}$	-0.181***	-0.103	0.111*	0.006	0.026	-0.167***
	(0.029)	(0.088)	(0.058)	(0.021)	(0.092)	(0.062)
ROA_{t-1} × topic-focused-meeting $_{t-1}$	0.672*	-1.764	-0.460	-0.304	0.466	0.767
	(0.390)	(1.389)	(0.659)	(0.298)	(1.293)	(0.977)
Age $_{t-1}$	0.061***	0.062***	0.062***	0.062***	0.062***	0.062***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Female	-0.446**	-0.447**	-0.425**	-0.433**	-0.434**	-0.421**
	(0.208)	(0.207)	(0.207)	(0.207)	(0.207)	(0.207)
Board size $_{t-1}$	-0.024	-0.026	-0.027	-0.028	-0.028	-0.026
	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)
Duality $_{t-1}$	-0.330**	-0.350**	-0.362**	-0.349**	-0.353**	-0.347**
	(0.158)	(0.156)	(0.157)	(0.156)	(0.156)	(0.157)
Independent directors % $_{t-1}$	1.196	1.153	1.098	1.094	1.086	1.121
	(0.841)	(0.835)	(0.835)	(0.835)	(0.835)	(0.835)
Largest shareholding% $_{t-1}$	-0.004	-0.003	-0.003	-0.003	-0.003	-0.003
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
State-owned enterprises $_{t-1}$	0.152	0.152	0.165	0.165	0.160	0.146
	(0.149)	(0.149)	(0.149)	(0.149)	(0.149)	(0.149)
Ownership Concentration $_{t-1}$	-0.615	-0.717	-0.696	-0.685	-0.689	-0.811
	(0.663)	(0.658)	(0.658)	(0.658)	(0.658)	(0.661)
Log(employees) $_{t-1}$	-0.019	-0.013	-0.006	-0.011	-0.010	-0.010
	(0.057)	(0.056)	(0.056)	(0.056)	(0.056)	(0.056)
Log(firm size) $_{t-1}$	-0.174**	-0.170**	-0.178**	-0.177**	-0.179**	-0.158**
	(0.074)	(0.074)	(0.074)	(0.074)	(0.074)	(0.074)
Leverage $_{t-1}$	0.346*	0.319	0.348*	0.336*	0.332*	0.284
	(0.202)	(0.202)	(0.203)	(0.202)	(0.202)	(0.203)
Year & Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Wald x^2	266.663	234.942	229.755	227.206	226.575	234.923
Firm-years	8174	8174	8174	8174	8174	8174

Table 4. Models are estimated over the period 2005-2015. *p < .10, **p < 0.05, ***p < 0.01.

Table 4 shows that CEO dismissal and firm performance (ROA) are negatively associated after controlling for firm-level governance and characteristics. It indicates that CEO will be dismissed by boards if firm performance is poor. Our results are consistent with previous studies (e.g., Chen, Firth, and Xu, 2009; Conyon and He, 2012; Kato and Long, 2006b).

To test and evaluate the effects of topic-focused meetings on turnover-performance sensitivity, we introduce two variables, namely $topic\ focused\ meeting\ frequency_{\ it-1}$ and an interaction term $Performance_{it-1} \times topic\ focused\ meeting\ frequency_{\ it-1}$. For board meetings that discussed personnel changes involving directors, the CEO, and top management, the coefficients on the interaction term are significantly positive. This results suggest that the existence of board nomination meetings reduces the sensitivity of forced CEO dismissals to firm performance. Other board meeting topics are not likely to affect the dismissal-performance link.

In addition, the coefficients of *Financial reports and audit* meetings are positively significant, which implies that firms with more meetings discussing the financial report, auditor switches and changes of audit opinion are more likely to fire the CEO. The amendment of financial reports and changes of auditor opinion are probably related to poor firm performance and corporate governance problems. *Financial reports and audit* meetings help director to identify the weakness of firm performance, which could put more pressure on a firm to fire its CEO.

The number of CEO/chairman duality have negative effects on the probability of CEO dismissal, consistent with the finding of Goyal and Park (2002). Firms with more employees and larger size have a lower probability of forcibly dismissing their CEO. The coefficients of percentage of independent directors are negative, but not significant, which is consistent with the findings of Kato and Long (2006a) on Chinese market.

Overall, our results imply that different types of board meetings may impact the CEO turnover-performance sensitivity variously. Interestingly, the existence of board nomination meetings lessens the sensitivity of CEO dismissals to firm performance.

2.5.2 Compensation, Firm Performance, and Topic-Focused Board Meetings

Table 5 reports estimates from equation (2), in which we use panel data techniques with fixed effects to examine the effects of topic-focused boarding meetings on the relationship between executive compensation and firm performance in China. Compensation comprises salary, bonuses, and stipends. The sub-columns 1 to 6 represent each of the board meeting topics.

Table 5 shows that there is a positive relationship between executive compensation and firm performance, suggesting that a CEO's pay is generally higher in a good performance firm. Our results coincide with prior research (Conyon and He, 2012; Firth et al., 2006). It indicates that firm profitability is an important component in CEO's compensation contracting in China.

As for the interaction terms, the coefficient of ROA interacted with the frequency of meetings on growth strategy are significantly positive. This indicates that the sensitivity between executive compensation and firm performance is higher when a firm has more meetings on growth strategy, which is consistent with our conjectures about the role of topic-focused meetings. Meetings of growth strategies enable boards of directors to re-evaluate CEO capability and firm fundamentals deeply, and reward the CEO efforts on enhancing firm performance. Moreover, the coefficient on the interaction term of nomination meeting frequency and ROA is significantly negative, which suggests that the link between executive compensation and a firm's accounting performance is likely to be weakened by such meetings. Lastly, none of the interactions between other meeting topics and firm performance is statistically significant.

TABEL 5

The Effects of Meetings on the Six Major Topics on the sensitivity of CEO compensation to firm Performance. This table reports results from panel data regressions with fixed effects. Compensation is equal to the nature logarithm of the average of the three highest-paid executives' compensation. Firm performance is measured by ROA. Nominations, compensation, management routines, firm control transactions, changes of equity structure and growth strategies are the major topics discussed. Topic-focused meeting frequency is the frequency of annual meetings on each topic. Interaction terms between firm performance and the topic-focused meeting frequency capture the meetings' moderating effects on the relationship between compensation and firm performance. Other variable definitions are provided in Table 3. Models are estimated over the period 2005-2015. *p < .10, **p < .05, ***p < .01

Compensation	1 Nomination	2 Compen-sation	3 Financial reports and audit	4 Corporate control transactions	5 Change of equity structure	6 Growth strategies
ROA_{t-1}	1.195***	1.066***	1.180***	1.006***	1.027***	0.982***
	(0.093)	(0.081)	(0.138)	(0.150)	(0.081)	(0.082)
Topic-focused meeting frequency $_{t-1}$	0.014***	0.053***	0.021**	0.000	-0.010	-0.006
	(0.004)	(0.011)	(0.010)	(0.004)	(0.012)	(0.007)
ROA_{t-1} × topic-focused-meeting $_{t-1}$	-0.142***	-0.229	-0.287	0.027	0.182	0.329***
	(0.050)	(0.157)	(0.236)	(0.053)	(0.164)	(0.111)
Board size $_{t-1}$	0.012***	0.012***	0.012*	0.012*	0.012***	0.012***
	(0.004)	(0.004)	(0.006)	(0.006)	(0.004)	(0.004)
Duality $_{t-1}$	-0.004	-0.006	-0.005	-0.005	-0.004	-0.006
	(0.015)	(0.015)	(0.022)	(0.022)	(0.015)	(0.015)
Independent directors % $_{t-1}$	0.241**	0.246**	0.242	0.244	0.244**	0.244**
	(0.105)	(0.105)	(0.155)	(0.155)	(0.105)	(0.105)
Largest shareholding% $_{t-1}$	0.003***	0.003***	0.003**	0.003**	0.003***	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
State-owned enterprises $_{t-1}$	-0.100***	-0.097***	-0.099***	-0.100***	-0.100***	-0.099***
	(0.019)	(0.019)	(0.038)	(0.038)	(0.019)	(0.019)
Ownership Concentration $_{t-1}$	-0.080	-0.056	-0.073	-0.077	-0.076	-0.068
	(0.085)	(0.085)	(0.172)	(0.172)	(0.085)	(0.085)
Log(employees) $_{t-1}$	-0.009	-0.009	-0.009	-0.009	-0.010	-0.010
	(0.007)	(0.007)	(0.013)	(0.013)	(0.007)	(0.007)
Log(firm size) $_{t-1}$	0.196***	0.192***	0.198***	0.195***	0.197***	0.194***
	(0.009)	(0.009)	(0.019)	(0.019)	(0.009)	(0.010)
Leverage $_{t-1}$	-0.215***	-0.211***	-0.214***	-0.214***	-0.215***	-0.211***
	(0.024)	(0.024)	(0.047)	(0.047)	(0.024)	(0.024)
Year & Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.514	0.515	0.514	0.513	0.513	0.514
Firm-years	11874	11874	11874	11874	11874	11874

Additionally, we find that firms that hold more meetings discussing nomination and compensation may provide higher CEO compensation. This could be seen as evidence of the strong bargaining power of Chinese executives. Board size and the proportion of independent directors tend to have a positive effect on CEO compensation, as do the existence of a major shareholder and firm size which is consistent with Cao et al., (2011). However, state-owned

firms are no different to other firms when it comes to CEO pay level coincided with Conyon and He (2011).

Overall, the results signify that more meetings discussed firms' mergers and acquisitions and the use of IPO proceeds would improve the relationship between compensation and firm performance. In contrast, board nomination meetings weaken this relationship.

2.6 The Impact of Topic-Focused Board Meetings and Corporate Ownership in China

The Chinese listed firms have unique ownership structures. They often have controlling shareholders who can nominate/appoint their preferred agents to the boards and use their power to benefit themselves, sometimes at the expense of the minority shareholders. The real control power for the majority of the firms lies with either state owners or non-state owners. State-owners and non-state owners are really different operation goals that may hugely impact management motivations and actions. Non-State controlling owners often have strong incentives to maximize firm values (for their own interests), and monitor executive activities. State owners such as SOEs or government agents have to consider political, social, and economic goals (Allen et al., 2005). Because different controlling shareholders have various goals, we inspect whether corporate ownership affect the influence of board meetings on quality of corporate governance in this section.

We focus our examinations on two subsample: the SOEs subsample and the non-SOEs subsample. The SOEs subsample contains firms with State controlling shareholders, so State-owners probably have significant influence on board activities. Non-SOEs subsample consists of firms with non-state controlling shareholders, hence non-State-owners likely have dominant influence on board activities.

Table 6 presents estimation results for the effects of nomination meetings in SOEs and non-SOEs subsamples. The interaction terms $ROA_{t-1} \times Nomination\ meeting\ frequency_{t-1}$ are only significant in non-SOEs subsample. For CEO dismissal estimations, the sign of the interaction term in non-SOEs subsample is positive (Column (1) B), which is contradict with the negative sign of ROA effect. It suggests that board meetings on nomination deteriorate the sensitivity of CEO dismissal to performance in non-SOEs subsample. For CEO compensation estimation, the sign of the interaction term in non-SOEs subsample is negative (Column (2) B), which is contradict with the positive sign of ROA effect. It implies that nomination board meetings deteriorate the relationship between CEO compensation and performance subsample. In contrast, coefficients of interaction terms in SOEs subsample are not significant. Therefore, we find that nomination meetings fade quality of corporate governance in non-state controlled ownership, rather than a state-controlled ownership.

TABEL 6

The Effects of Nomination Meeting Frequency under Different Ownership Structure. This table reports results from panel data regressions with fixed effects. CEO dismissal is the dependent variable, which equals one if the CEO is dismissed, and zero otherwise. Compensation is equal to the nature logarithm of the average of the three highest-paid executives' compensation. Firm performance is measured by ROA. Nomination meeting frequency is the number of annual meetings on nomination. Interaction terms between ROA and the nomination meeting frequency capture the meetings' moderating effects on the relationship between CEO dismissal/compensation and firm performance. Other variable definitions are provided.

	(1) CEO dismissal		(2) CEO compensation	
	A. SOEs	B. Non-SOEs	A. SOEs	B. Non-SOEs
ROA_{t-1}	-2.911***	-4.317***	1.482***	0.737***
	(0.901)	(0.909)	(0.119)	(0.152)
Nomination meeting frequency $_{t-1}$	-0.175***	-0.062	0.005	0.020***
	(0.037)	(0.042)	(0.005)	(0.006)
$ROA_{t-1} \times$ Nomination meeting frequency $_{t-1}$	0.627	0.918*	-0.038	-0.191**
	(0.503)	(0.510)	(0.064)	(0.080)
Control variables $_{t-1}$	Yes	Yes	Yes	Yes
Wald χ^2	217.832	139.434		
R^2			0.497	0.531
Firm-years	5844	4155	7728	4146

Table 7 shows estimation results for the effects of growth strategy meetings in SOEs and non-SOEs subsamples. In both subsamples, the interaction terms *ROA × Growth strategies meetings* are significantly positive related to CEO compensation, and these signs have same direction with these of firm performance. It suggests that growth strategy meetings enhance sensitivities of CEO compensation to performance regardless the influence of ownership structures. Furthermore, the magnitude of coefficient of interaction term in non-State-controlled firms (Column B) is greater than that in State-controlled firms (Column A). Overall, we find that meeting frequency on growth strategies enhance quality of corporate governance in improving CEO compensation-performance sensitivity.

Table 7
The Effects of Meeting Frequency on Growth Strategies under Different Ownership Structure. This table reports results from panel data regressions with fixed effects. Compensation is equal to the nature logarithm of the average of the three highest-paid executives' compensation. Firm performance is measured by ROA. Meeting frequency of growth strategies is the number of annual meetings on growth strategies. Interaction term between ROA and the meeting frequency of growth strategies captures the meetings' moderating effects on the relationship between CEO compensation and firm performance. Other variable definitions are provided.

	CEO compensation	
	SOEs	Non-SOEs
ROA_{t-1}	1.379***	0.428***
	(0.107)	(0.134)
Growth strategies meetings $_{t-1}$	-0.010	-0.006
	(0.009)	(0.012)
ROA_{t-1} × Growth	0.330**	0.452**
strategies meetings $_{t-1}$	(0.141)	(0.178)
Control variables $_{t-1}$	Yes	Yes
R^2	0.497	0.530
Firm-years	7728	4146

2.7 Endogeneity Problems.

In addition, we adopt the IV and GMM (IV-GMM) method to control for potential endogeneity problems, particularly simultaneous causality concerns. We instrument the potentially endogenous variables of firm performance and topic-focused board meetings using a set of exogenous variables, selected according to economic rationales.

Following the literature, we instrument the firm performance using the second and third lags of performance and the first lagged GDP, which could be correlated with the lagged performance, but not directly related to CEO compensation (e.g. González et al., 2014; Shin and Seo, 2011). We also use average-independence and average-board-meetings to capture the industry-average level of board independence and board activity[2]. Firms' governance arrangements are likely to be associated with those of their peers in the same industry, due to having the same business arrangements and market environment (Liu et al., 2015). Therefore, the industry average of board independence and board activity could affect the board effectiveness of any firm in that industry, and thereby the frequency of board meetings. Moreover, since the stickiness of board meetings may be an issue, we use the second and third lag of topic-focused meeting frequencies as instruments in their own individual estimations.

We perform a "difference-in-Sargan-statistic" test to examine whether endogeneity exists in firm performance and topic-focused meetings. The results show that the topic-focused meeting frequency can actually be treated as exogenous in the CEO dismissal model, as the F-statistics were insignificant in all cases. However, topic-focused meetings should be treated as endogenous in the compensation model, and firm performance as endogenous in both models.

[2] Average-independence is measured as the mean value of the percentage of independent directors in other firms in the same industry and year. Average-board-meetings is the mean value of board meeting frequency in other firms in the same industry and year.

Next, we check whether the suitability of our instruments is confirmed by the identification tests. Based on the Sargan-Hansen test, we cannot reject the null that our instruments are uncorrelated with the error terms, that is, unrelated to CEO dismissal and compensation. The results of the Kleibergen-Paap rk and Stock and Yogo statistics for the weak identification problem are significant in all cases, rejecting the null that our instruments are weakly related to firm performance or topic-focused board meetings. Overall, our instruments are valid for reducing the simultaneous causality concerns. The IV-GMM estimates are in line with our earlier findings.

2.8 Robustness Tests

2.8.1 Alternative measures of CEO dismissal and compensation.

As mentioned when we defined the variable of CEO dismissal, using public information to classify forced or unforced CEO dismissals may be problematic. Following previous research (e.g., Kaplan and Minton, 2012; Kato and Long, 2006b), we employ a binary variable that equals one to measure any type of CEO personnel change, regardless of the reason for dismissal. We re-estimate the logit equation (1) using this new definition of CEO dismissal (forced and unforced) as the dependent variable. Our results are qualitatively similar to those obtained using forced CEO dismissal.

We also use the individual-level CEO payment data available from the year 2005 as a robustness check. After 2005, individual compensation data are available; approximately 40% of CEOs did not receive any compensation from the listed firms in our sample. These CEOs are likely to have received their salaries from the mother company, or to have held a large proportion of shares. The sample including 3,454 listed-firm-year observations over the period of 2005-2010. The results based on the individual data are similar to those based on aggregate compensation (Appendix C). The coefficient on the interaction term (nomination meeting

frequency × ROA) is significantly negative, which suggests that the link between executive compensation and a firm's accounting performance is likely to be weakened by such meetings. Unreported results for ROE and the profit margin are similar to those for ROA.

Furthermore, considering the influence of the compensation paid to peers in the same industry, we use relative aggregate executive compensation as the payment measure. We calculate the relative aggregate executive compensation by subtracting the industrial median of the average compensation of the three highest executives in firms within the same industry and year. Our results are similar after performing this robustness check.

2.8.2 Relative Performance Measures.

For the sensitivity analysis, we also adopt industry-adjusted performance measures, since the evaluation of a CEO's performance may be based on his/her industry peers (e.g. Morck, Shleifer, and Vishny, 1988). The firm's relative performance is measured as the firm's performance minus the median performance of firms in the same industry and year. The unreported outcomes remain qualitatively similar. We also use a different time period (2005-2010 instead of 2003-2010), reflecting the change in disclosure quality after 2005. Again, our main results stay qualitatively unaltered.

2.8.3 Eleven meeting topics recorded in the CSMAR

In order to test whether our results are affected by grouping strategies on meeting topics, we re-estimate equations (1) and (2) using meeting frequencies of eleven topics recorded in the CSMAR (see Column 2 of Table 1). Except for meetings on nomination, the interactions of other types of meetings are not significant for CEO dismissal and performance sensitivity. Regarding the CEO compensation sensitivity to firm performance, the interactions of meetings on merger and acquisitions (6) and use of IPO proceeds (9) and firm performance are positively significant, while other interactions are not significant. Meetings and merger and acquisitions (6) and the use of IPO proceeds (9) were combined into meetings on growth strategies in the

main analysis. Therefore, unreported results for eleven meeting topics show consistent results with our main analysis based on the six major topics.

2.8.4 China-specific control variables.

As our study is based on Chinese listed firms, we further add more control variables to considers the special institutional and economic environment. After the US board system has been introduced to China in year 2001, the supervisory board of directors still exists. Thus, we add the size of supervisory board to control for the potential effect of the monitoring from supervisors. Regarding the regional imbalances in economic growth, we add the Chinese government transparency index (or regional dummies) accordingly. Our key results remain unaltered after considering characteristics of the Chinese market.

2.9 Discussion and Conclusions

The purpose of this paper is to provide a better understanding of how board activity affects board effectiveness in linking CEO compensation/dismissal to firm performance. In our empirical examination, to measure board activity, we decided to move beyond the frequency and target the contents of board meetings. Board meetings, the main venue for directors to fulfill their monitoring obligations, are normally topic-focused. As shown in our data, the topics of meetings include the management and directors' nominations and compensation, management routines, firm control transactions, changes in equity structure, and growth strategies. Although the role of board meetings has been widely discussed by academics and practitioners, previous studies tend to portray them as standardized at the firm level.

To fill this gap in the literature, we exploit a unique dataset on board meeting agendas of Chinese listed firms over the period 2003-2010. First, we examine whether the sensitivity of CEO dismissal (compensation) to performance is significantly negative (positive), which generally reflects the effectiveness of the board monitoring and even the efficiency of corporate

governance. Secondly, we examine the influences of topic-focused meetings on these two sensitivities. The rationale behind this is that discussing certain topics could enhance the informativeness of the board, thus helping directors to strengthen those sensitivities, thereby improving the corporate governance mechanism.

Our results reveal that CEO dismissal is significantly negatively and compensation positively correlated to all of the accounting-based performance measures. However, the market-based performance measures play a limited role in explaining the probability of CEO dismissal or the size of compensation. Our results suggest that a firm's profitability is still the main criterion used to evaluate the CEO's performance. We also find that the frequencies of meetings on major topics are diverse, as are the roles of such meetings in monitoring the top management. In particular, the sensitivity between CEO compensation and performance is stronger when there are more board meetings on growth strategies, such as mergers and acquisitions and applying IPO proceeds. When directors discuss firm growth strategies, they could obtain comprehensive information about history and current firm performance and future strategies. Our results suggest the soft information captured in board meetings is likely to influence directors' evaluations of the CEO's capability, and they will change the CEO compensation scheme accordingly, to motivate the CEO and other managers. Meanwhile, most of the major topics of board meetings are not likely to affect the sensitivity between CEO turnover and performance. In fact, meetings on nominations could even reduce both turnover-performance and pay-performance sensitivity.

In China, the majority of listed firms have dominant State shareholders or non-State shareholders. These two types of shareholders have different goals, which may influence managerial incentives, and selections or activates of board members. We use subsample analyses, and find that board meetings on growth strategies could enhance CEO compensation-performance sensitivity in both types of firms. However, meetings on nominations reduce both

turnover-performance and pay-performance sensitivity in firms controlled by dominant non-State shareholders.

The findings of our study suggest that differences in the effects of different meeting topics on the CEO pay/dismissal-to-performance sensitivities and highlight the need for more tailored approaches towards board requirements. In the countries that carry out good 'corporate governance guidance' policies, regulators' agendas have stayed focused on board composition and structure, and the total number of annual meetings, as the means to allow boards to best perform their duties. A sound board structure following such guidance alone cannot 'make great boards great' (Sonnenfeld, 2002). To a certain degree, our study reflects the complexities involved in the board decision-making process. Thus, it calls for a reconsideration of the current one-size-fits-all approach taken by the regulators. Particularly in China, the regulators should consider introducing regulations to prevent potentially self-interested behaviour from CEO and non-State controlling shareholders via making nominations and personnel changes to the directors and top management.

References

Adams, R. B. 2005. What do boards do? Evidence from board committee and director compensation data. *Working Paper. Stockholm School of Economics*.

Adams, R. B., & Ferreira, D. 2009. Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics*, 94(2): 291–309.

Agrawal, A., & Knoeber, C. R. 1996. Firm performance and mechanisms to control agency problems between managers and shareholders. *Journal of Financial and Quantitative Analysis*, 31(3): 377–397.

Allen, F., Qian, J., & Qian, M. 2005. Law, finance, and economic growth in China. *Journal of Financial Economics*, 77(1): 57–116.

Bai, C.-E., Liu, Q., Lu, J., Song, F. M., & Zhang, J. 2004. Corporate governance and market valuation in China. *Journal of Comparative Economics*, 32(4): 599–616.

Bai, C. E., & Xu, L. C. 2005. Incentives for CEOs with multitasks: Evidence from Chinese state-owned enterprises. *Journal of Comparative Economics*, 33(3 SPEC. ISS.): 517–539.

Bebchuk, L. A. 1999. A rent-protection theory of corporate ownership and control. *Economics and Business Discussion Paper Series*, 48.

Boyd, B. K. 1994. Board control and ceo compensation. *Strategic Management Journal*, 15(5): 335–344.

Brammer, S., Millington, A., & Pavelin, S. 2007. Gender and ethnic diversity among UK corporate boards. *Corporate Governance : An International Review*, 15(2): 393.

Brick, I. E., & Chidambaran, N. K. 2010. Board meetings, committee structure, and firm value. *Journal of Corporate Finance*, 16(4): 533–553.

Brick, I. E., Palmon, O., & Wald, J. K. 2006. CEO compensation, director compensation, and firm performance: Evidence of cronyism? *Journal of Corporate Finance*, 12(3): 403–423.

Cao, J., Pan, X., & Tian, G. 2011. Disproportional ownership structure and pay-performance relationship: Evidence from China's listed firms. *Journal of Corporate Finance*, 17(3): 541–554.

Carpenter, M. A., & Sanders, W. G. 2002. Top management team compensation: The missing link between CEO pay and form performance? *Strategic Management Journal*, 23(4): 367–375.

Carter, D. A., D'Souza, F., Simkins, B. J., & Simpson, W. G. 2010. The gender and ethnic diversity of US boards and board committees and firm financial performance. *Corporate Governance*, 18(5): 396–414.

Chang, E. C., & Wong, S. M. L. 2009. Governance with multiple objectives: Evidence from top executive turnover in China. *Journal of Corporate Finance*, 15(2): 230–244.

Chen, G., Firth, M., Gao, D. N., & Rui, O. M. 2006. Ownership structure, corporate governance, and fraud: Evidence from China. *Journal of Corporate Finance*, 12(3): 424–448.

Chen, G., Firth, M., & Xu, L. 2009. Does the type of ownership control matter? Evidence from China's listed companies. *Journal of Banking and Finance*, 33(1): 171–181.

Coles, J. L., Daniel, N. D., & Naveen, L. 2008. Boards: Does one size fit all? *Journal of Financial Economics*, 87(2): 329–356.

Conyon, M., & He, L. 2011a. Executive compensation and corporate governance in China. *Journal of Corporate Finance*, 17(4): 1158–1175.

Conyon, M., & He, L. 2012. CEO compensation and corporate governance in China. *Corporate Governance: An International Review*, 20(6): 575–592.

Conyon, M., & He, L. 2014. CEO turnover in China: The role of market-based and accounting performance measures. *The European Journal of Finance*, 20(7–9): 657–680.

Conyon, M. J., & He, L. 2011b. CEO Compensation and Corporate Governance in China. *Corporate Governance (Oxford)*, 17(6): 1158–1175.

Core, J. J. E., Holthausen, R. R. W., & Larcker, D. F. D. 1999. Corporate governance , chief executive officer compensation , and firm performance. *Journal of Financial Economics*, 51: 371–406.

Dah, M., Frye, M., & Hurst, M. 2014. Board changes and CEO turnover: The unanticipated effects of the Sarbanes–Oxley Act. *Journal of Banking & Finance*, 41: 97–108.

Defond, M., & Hung, M. 2004. Investor protection and corporate governance: Evidence from worldwide CEO turnover. *Journal of Accounting Research*, 42(2): 269–312.

Denis, D., & Denis, D. 1995. Performance changes following top management dismissals. *The Journal of Finance*, 50(4): 1029–1057.

Dou, Y., Sahgal, S., & Zhang, E. J. 2015. Should Independent Directors Have Term Limits? The Role of Experience in Corporate Governance. *Financial Management*, 44(3): 583–621.

Fama, E. F. 1980. Agency problems and the theory of the firm. *The Journal of Political Economy*, 88(2): 288–307.

Fama, E. F., & Jensen, M. C. 1983. Separation of ownership and control. *The Journal of Law and Economics*, 26(2): 301–325.

Ferreira, M. A., & Matos, P. 2008. The colors of investors' money: The role of institutional investors around the world. *Journal of Financial Economics*, 88(3): 499–533.

Firth, M., Fung, P. M. Y., & Rui, O. M. 2006. Corporate performance and CEO compensation in China. *Journal of Corporate Finance*, 12(4): 693–714.

Forbes, D. P., & Milliken, F. J. 1999. Cognition and corporate governance: Understanding boards of directors as strategic decision-making groups. *The Academy of Mangement Review*, 24(3): 489–505.

Francis, B., Hasan, I., & Wu, Q. 2015. Professors in the Boardroom and Their Impact on Corporate Governance and Firm Performance. *Financial Management*, 44(3): 547–581.

Gillan, S. L., & Starks, L. T. 2003. Corporate governance, corporate ownership, and the role of institutional investors : A global perspective. *Journal of Applied Finance,* 13(2): 44.

Goergen, M., Limbach, P., & Scholz, M. 2015. Mind the gap: The age dissimilarity between the chair and the CEO. *Journal of Corporate Finance*, 35: 136–158.

González, M., Guzmán, A., Pombo, C., & Trujillo, M.-A. 2015. The role of family involvement on CEO turnover: Evidence from Colombian family firms. *Corporate Governance: An International Review*, 23(3): 266–284.

Goyal, V. K., & Park, C. W. 2002. Board leadership structure and CEO turnover. *Journal of Corporate Finance*, 8(1): 49–66.

Greene, W. H. 2003. *Econometric analysis*. Upper Saddle River, NJ: Prentice-Hall.

Guthrie, K., Sokolowsky, J., & Wan, K. M. 2012. CEO compensation and board structure revisited. *Journal of Finance*, 67(3): 1149–1168.

Hermalin, B. E., & Weisbach, M. S. 2003. Boards of directors as an endogenously determined institution: A survey of the economic literature. *Economic Policy Review*, 9(1): 7.

Hou, W., Lee, E., Stathopoulos, K., & Tong, Z. 2013. Executive compensation and the split share structure reform in China. *The European Journal of Finance*, (March 2014): 1–23.

Jensen, M. C., & Meckling, W. H. 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4): 305–360.

Jensen, M. C., & Murphy, K. J. 1990. Performance pay and top-management incentives. *Journal of Political Economy*, 98(2): 225.

Jenter, D., & Kanaan, F. 2015. CEO turnover and relative performance evaluation. *Journal of Finance*, 100(5): 2155–2183.

Jiang, W., Wan, H., & Zhao, S. 2016. Reputation Concerns of Independent Directors: Evidence from Individual Director Voting. *Review of Financial Studies*, 29(3): 655–696.

Johnson, S., Boone, P., Breach, A., & Friedman, E. 2000. Corporate governance in the Asian financial crisis. *Journal of Financial Economics*, 58(1–2): 141–186.

Kaplan, S. N., & Minton, B. A. 2012. How has CEO turnover changed? *International Review of Finance*, 12(1): 57–87.

Kato, T., & Long, C. 2006a. Executive turnover and firm performance in China. *The American Economic Review*, 96(2): 363–367.

Kato, T., & Long, C. 2006b. CEO turnover, firm performance, and enterprise reform in China: Evidence from micro data. *Journal of Comparative Economics*, 34(4): 796–817.

Lipton, M., & Lorsch, J. W. 1992. A modest proposal for improved corporate governance: Business source. *The Business Lawyer*, 48(1): 59–78.

Liu, Y., Miletkov, M., Wei, Z., & Yang, T. 2015. Board independence and firm performance in China. *Journal of Corporate Finance*, 30: 223–244.

Lo, A. W. Y., Wong, R. M. K., & Firth, M. 2010. Can corporate governance deter management from manipulating earnings? Evidence from related-party sales transactions in China. *Journal of Corporate Finance*, 16(2): 225–235.

Ma, J., & Khanna, T. 2016. Independent directors' dissent on boards: Evidence from listed companies in China. *Strategic Management Journal*, 37(8): 1547–1557.

Morck, R., Shleifer, A., & Vishny, R. W. 1988. Management ownership and market valuation. *Journal of Financial Economics*, 20: 293–315.

Ocasio, W., & Joseph, J. 2005. An attention-based theory of strategy formulation: Linking micro- and macroperspectives in strategy processes. *Advances in Strategic Management*, 22(5): 39–61.

Peng, W. Q., Wei, K. C. J., & Yang, Z. 2011. Tunneling or propping: Evidence from connected transactions in China. *Journal of Corporate Finance*, 17(2): 306–325.

Ryan, H. E., & Wiggins, R. A. 2004. Who is in whose pocket? Director compensation, board independence, and barriers to effective monitoring. *Journal of Financial Economics*, 73(3): 497–524.

Schwartz-Ziv, M., & Weisbach, M. S. 2013. What do boards really do? Evidence from minutes of board meetings. *Journal of Financial Economics*, 108(2): 349–366.

Shin, J. Y., & Seo, J. 2011. Less pay and more sensitivity? Institutional investor heterogeneity and CEO pay. *Journal of Management*, 37(6): 1719–1746.

Shivdasani, A. 1993. Board composition, ownership structure, and hostile takeovers. *Journal of accounting and economics*, 16(1–3): 167–198.

Shivdasani, A., & Yermack, D. 1999. CEO Involvement in the Selection of New Board Members: An Empirical Analysis. *The Journal of Finance*, 54(5): 1829–1853.

Shleifer, A., & Vishny, R. W. 1997. A survey of corporate governance. *The Journal of Finance*, 52(2): 737–783.

Sonnenfeld, J. a. 2002. What makes great boards great. *Harvard Business Review*, 80(9): 106.

Stiles, P. 2001. The impact of the board on strategy: an empirical examination. *Journal of Management Studies*, 38(5): 627–650.

Tang, X., Du, J., & Hou, Q. 2013. The effectiveness of the mandatory disclosure of independent directors' opinions: Empirical evidence from China. *Journal of Accounting and Public Policy*, 32(3): 89–125.

Tirole, J. 2001. Corporate governance. *Econometrica*, 69(1): 1–35.

Vafeas, N. 1999. Board meeting frequency and firm performance. *Journal of Financial Economics*, 53(1): 113–142.

Weisbach, M. S. 1988. Outside directors and CEO turnover. *Journal of Financial Economics*, 20: 431–460.

Yermack, D. 1996. Higher market valuation of companies with a small board of directors. *Journal of Financial Economics*, 40(2): 185–211.

You, J., & Du, G. 2012. Are political connections a blessing or a curse? Evidence from CEO turnover in China. *Corporate Governance : An International Review*, 20(2): 179–194.

Appendix A
An Examples of Independent Director' Reports. Compensation (2) and Loan Guarantees (5) were discussed on 27 April 2007 in board meeting of Wuhan Zhongnan Commercial Group Co., Ltd (WHZS, 000785).

Stock trading code: 000785 (SHE)
Company name: Wuhan Zhongnan Commercial Group Co., Ltd (WHZS)
Announcement date: 27 April 2007
Independent directors: Tan, Liwen; Li, Yanping; Xie, Huobao
Topic code: 2-Compensation; 5- Loan Guarantees
Opinion type: unqualified opinion
Content:
Pursuant to the "Guiding Opinions on Establishing Independent Directors in Listed Companies", "Shenzhen Stock Exchange Listing Rules", "Articles of Association", and other related regulations, we would like to issue the following opinion on WHZS's following two following issues passed at the fourth meeting of the sixth session of the board of directors:

First, to our best knowledge, we agree that compensations of directors and senior management in 2006 have meet the plan requirements-" the implementation plan of company directors and senior management compensation in 2006" approved by the annual General Meeting (2005).

Second, based on the annual report 2006 of WHZS, the audit report 2006 (2007-421), and the "Special statement of controlling shareholders and other related parties possessing fund of the listed firm"(2007-148) provided by Wuhan Zhonghuan Accounting Firms, we have carefully examined the incurred and accumulative amount of loan guarantees, we believe the loan guarantees for subsidiary companies in 2006 was 160 million RMB, accumulated to 260 million. No other loan guarantees for related parties happened in 2006.

Appendix B

Correlation of Main Variables. CEO dismissal is a dichotomous variable, which equals one if the CEO is dismissed, and zero otherwise. Compensation is equal to the nature logarithm of the average of the three highest-paid executives' compensation. Other variables are lagged values. Meetings definitions are provided in Table 1, and other independent variable definitions are shown in Table 2. †p < .10, *p < .05, **p < .01

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	CEO dismissal	1																			
2	Compensation	-0.07**	1																		
3	Nomination	0.23**	0.10**	1																	
4	Compensation	0	0.22**	0.21**	1																
5	Financial reports and audit	0.03**	0.05**	0.27**	0.22**	1															
6	Corporate control transactions	0.04**	0.15**	0.21**	0.14**	0.23**	1														
7	Change of equity structure	0.01	-0.15**	-0.08**	-0.06**	-0.04**	-0.06**	1													
8	Growth strategies	-0.01	0.14**	0.16**	0.20**	0.19**	0.21**	-0.06**	1												
9	ROA	-0.08**	0.25**	-0.06**	0.05**	-0.10**	-0.01	0	-0.01	1											
10	Age	-0.13**	0.24**	-0.02+	0.07**	0	0.02*	-0.05**	0.05**	0.10**	1										
11	Female	0	0.01	0	0	-0.02**	-0.02*	0.01	0	0.01	-0.03**	1									
12	Board size	-0.04**	0.11**	0	-0.01	-0.09**	0.02*	0.03**	-0.02+	0.05**	0.06**	-0.01+	1								
13	Duality	0.01	-0.02+	0.01	0.05**	0.08**	-0.03**	0	0.03**	-0.03**	-0.01	-0.01+	-0.12**	1							
14	Independent directors %	0.02**	0.07**	0.03**	0.06**	0.06**	0.03**	-0.06**	0.07**	-0.02**	0.02**	-0.02*	-0.32**	0.05**	1						
15	Largest shareholding%	0.02*	0.08**	0	-0.01	-0.07**	0.02+	-0.03**	0.01	0.10**	0.09**	-0.01	0.06**	-0.12**	0.06**	1					
16	State-owned enterprises	0.05**	0	-0.04**	-0.13**	-0.11**	0.02**	0.01	-0.08**	-0.02*	0.06**	-0.03**	0.20**	-0.17**	-0.05**	0.39**	1				
17	Ownership Concentration	0.02+	0.07**	0	-0.02**	-0.08**	0.04**	-0.02*	-0.02*	0.13**	0.07**	-0.01	0.08**	-0.12**	0.03**	0.76**	0.24**	1			
18	Log(employees)	-0.05**	0.31**	0	0.08**	-0.05**	0.13**	-0.05**	0.09**	0.13**	0.20**	-0.04**	0.26**	-0.07**	0.02**	0.22**	0.24**	0.25**	1		
19	Log(firm size)	-0.04**	0.54**	0.05**	0.13**	-0.02**	0.20**	-0.11**	0.12**	0.17**	0.24**	-0.02**	0.25**	-0.10**	0.10**	0.34**	0.23**	0.35**	0.68**	1	
20	Leverage	0.05**	-0.09**	0	-0.04**	0.02*	0.08**	0.01	-0.07**	-0.18**	-0.09**	0	0.01	0.01	0.02*	-0.05**	-0.02*	-0.04**	-0.01	0.04**	1

Chapter 4: The Hidden Information Content:

Evidence from the Tone of Independent Director Reports

ABSTRACT

The paper examines whether the information content of independent director reports (IDRs) has predication power on corporate performance. We generate the tone of IDRs by using Chinese word segmentation and Naïve Bayesian machine leaning algorithm. We find that the average tone of the IDRs is positively related with future firm performance after controlling other factors that influence firm performance. Our results also show that directors with more careers concerns are more likely to be critical and using negative tone when they express opinions. Furthermore the negative tone of IDRs is negatively associated with firm performance for firms with greater monitoring necessities.

Key Words: Text Analysis, Tone, Independent Director, Corporate Governance

4.1 Introduction

A practical difficulty for corporate governance is the existence of asymmetric information. In corporations, asymmetric information generally refers to circumstances that the agent (e.g. managers) who agrees to carry out some duties, have more information than the principal (e.g. shareholders). Thus the principal has difficulties to assess whether corporate outcome is owing to the agent' efforts/fails or owing to situations that are unmanageable by the agent. The agent may decide to run the corporation in her/his interests instead of the principle's ones (e.g. Jensen and Meckling, 1976).

Boards of directors are believed to be an essential internal governance mechanism, although various agency problems and corporate governance systems exist around the world[19]. Boards have liability and ultimate legal authority regards decision marking in corporations. Boards must evaluate and authorise corporate financial and operation decisions, and other plans and strategies (e.g. Adams and Ferreira, 2007; Fama and Jensen, 1983a). As a results, board of directors at least have more information than minority shareholders and other stakeholders that cannot access to firm information except from public disclosures (such as annual reports).

The communication by boards of directors offer researchers a great setting in which to recognise private information sets, namely seeing corporate operations from director' eyes. The examination of directors' communication could be helpful for stakeholders which cannot

[19] Due to the different ownership structure around the world, there are two typical types of agency problems: one is the classic agency problem due to professional managers who have limited shareholdings run the corporations on the behavour of the shareholding as in the US and the UK; the other one is the potential expropriation of the minority shareholders (e.g. La Porta, Lopez-De-Silanes, and Shleifer, 1999). This is because that in other countries, corporations usually have controlling and minority shareholders, however only controlling shareholders have enough power to influence firms' decision making process.

engage in firm decision-making to understand firm behaviour. For instant, the theory of administrative behaviour states that employee communication patterns during critical decision-making could expose the structural organization design (Simon, 1999). It has been found that manager's disclosures have significant associates with firm profitability and earning quality (e.g. Li, 2008, 2010a).

However, whether director disclosures are truly informative remains an open empirical question. First, directors of boards may also may lack of information. Especially non-executive directors primarily rely on the chief executive and management for information. Management is probably reluctant share information with boards if they have been monitored intensively (Adams and Ferreira, 2007). Second, directors are criticized to be passive in monitoring firm decisions. They barely challenge management' proposals to keep 'friendly' relationship with management, since the management has power in replacement and appointment of board member (Hermalin and Weisbach, 1998; Warther, 1998). Therefore, the informativeness of directors' disclosures are determined by their capability and willing to require enough information.

Boards of directors normally do not have an independent channel to release their opinions on corporate decisions. China provides us a unique setting to study the information content of board's disclosures. Chinese Securities Regulatory Commission (CSRC) launched a novel practice that independent directors in listed firms are mandated to publicly issue their opinions after board meetings, to protect the minority shareholders. Independent director's reports contains firm identifier, topics and proposals discussed in the board meetings (narratives), and

director opinions. From 2004 to 2012, about 24300 reports[20] have been issued about board meetings in Chinese non-financial companies listed on main boards of Shanghai and Shenzhen Stock Exchange. Jiang, Wan and Zhao (2016) and Tang, Du, and Hou (2013) start to explore the 'disagree opinions' in this dataset, they find that shareholders, creditors and regulators actively react to director's dissension, subsequently improve corporate governance and market transparency. However, over 98% of these reports are 'agreement' opinions.

Director's tone in a report is the attitude towards firm historical and current operations and the fitness of proposals discussed to a firm. We employ a Naïve Bayesian learning algorithm with Chinese word segmentation to evaluate the tone of about 23900 independent director reports with "agreement" opinions over the period of 2004 to 2012. First, we examine whether information content in normal independent director reports has power to predict future firm performance. Using panel data analysis with fix effects, we investigate whether the average tone of independent director reports in a firm is (positively) associated with firm future performance. We find that the tone of independent director' report is positively related to one period future performance. Further, the positive (negative) tone is positive (negative) related to firm future performance. Our results suggests that the report' tone has explanatory power incremental to other factors in forecasting future performance. It is also an empirical evidence to support that board of directors do understand the problems/opportunities in business operations and 'attempt' to reveal information to outside stakeholders.

[20] There are 11 topics (categories) discuss in board meetings by CSRC requirements (2001): personnel and compensation of directors and top management, financial reports and audit, and operating decisions including the authorization of related party transactions and guaranteed loans, merger and acquisitions, changes in ownership, financing, disposal of assets, and other miscellaneous events.

Further, we study the determinants of explaining the variations in the tone of independent director's report. Since the information content of directors' disclosures rely on directors' motivation and expertise, directors' monetary and reputation incentives, their working experiences, and other board features are included in the model. Liebman and Milhaupt (2008) point out that directors who lean to achieve high aspirations and self-accomplishments have to build reputation for more career and business opportunities beyond board seats in a countries with weak institutional environment. We find that directors who has more career concerns (such as younger directors and directors with accounting background) are more likely to issue negative report. Our results also show that firms with more board committees, greater board meetings, less leverage, and controlled by private shareholders tend to have more positive independent director reports.

Finally, we find empirical evidence to support our hypothesis that independent director play more monitoring role in firms with greater monitoring necessities. We use subsample analyses and find that the negative tone of IDRs is negative corrected to firm future performance. In firms with higher liquidity or bankruptcy risk or with bad performance, the relationship is negative and significant. By contrast, the coefficients of negative tone are negative but insignificant (smaller magnitude) in lower higher liquidity or bankruptcy risk firms.

Our results are robust after controlling board and firm characteristics and in sub-periods, Although claim causality relationship between the tone of reports and firm profitability, IV-GMM estimator is still applied in our study as robust check to mitigate other endogenous issues. The main results do not alter.

Our study contributes to the literature in two ways. First, this study provides new evidence on corporate disclosures by using a large sample dataset of director's views on firm profitability. Previous research largely focuses on the manager's views (e.g. Li, 2008, 2010, 2011). The paper also extends the literature on the effectiveness of boards of directors. We explore

directors' roles in corporate governance via director disclosures rather drawing interferences from board structure such as board composition (Weisbach, 1988), diversity (Adams & Ferreira, 2009) and size (Eisenberg, Sundgren, and Wells, 1998).

We also provide more evidence to support the regulations of launching independent director system. Independent director system can benefit to protect the outside stakeholders by providing more monitoring on firm operations. It complements the literature on dissension opinions in this practice (Jiang et al., 2016; Ma, 2013; Tang et al., 2013), to support regulations that requires the disclosure of independent directors reports on firm's proposals and business procedures.

The rest of this paper is organizes as follows. Section 2 discuss the institutional background of independent director system in China, the implications of textual analysis using Naïve Bayesian learning algorithm, and hypotheses development. Section 3 present the details of method to create the tone of independent director's report and model design, and sample statistics. Section 4 discusses the empirical results and Section 5 presents the robustness check. Section 6 concludes the paper.

4.2 Corporate Governance in China: the role of independent director and their reports

Although Chinese stock market is the second largest one, over $10.3 trillion by 2015, according to the World Federation of Exchanges, the quality of corporate governance is unmatched with market capitalization status. The market, established around 1990, was aimed to provide state-owned enterprises (SOEs) capital and liquidity to develop and reform. Consequently, listed firms derived from SOEs (over 60 %) are still controlled or strongly interfered by government, government agent or an SOE. Additionally, the legal structure in "private" listed firms is complicated with concentrated ownership and group affiliations (Allen, Qian, and Qian, 2005). Both issues cause interest conflicts between controlling and minority shareholders and low

transparency in corporate operations. A supervisory board in listed firms is obligatory like the one in German's two board system, however issues of corporate governance are still severe due to the lack of independence and accountability of supervisory board members.

The independent director system is set up in 2001[21] using the experience of the US and UK corporate governance law and practice. It contains regulations about the selection/dismissal, composition and responsibilities of independent directors to ensure their independence from controlling shareholders, management and corporate business relations[22]. The responsibility to protect the interests of all the stakeholders are expected to rely on the independent directors. The role of main board director is comparable with that of the US. Boards of directors have a legitimate obligation to oversee firm's strategic decisions and polices, and to select, review, compensate, and when in need of, terminate top management. The function of boards is mainly through discussing and voting proposals at board meetings. A proposal has to obtain support by the majority of board to be effective. Numbers of empirical studies (e.g. Conyon and He, 2012; Kato and Long, 2006; Liu, Miletkov, Wei, and Yang, 2015) show that board independence have significant positive effects on corporate governance, in terms of improving firm performance and efficiency of compensating/dismissal CEO to performance and reducing insider tunneling.

---

[21] The system establishment is based on "Guideline for the establishment of the independent director system in listed firms" by the China Securities Regulatory Commission (CSRC) in August 2001, then legal status is established in new "Corporate Law of China" 2005.

[22] For example, independent directors can be nominated by board and supervisory board members or shareholders who has at least one percentage share; appointment decisions are made by shareholders' meeting. They constitute at least one third of board, only serve maximally two terms (6 years). They are not employees in the listed firms, or have kinships with corporate employees. They do not have over 1 % share of listed firm, or they do not have kinships with nature people in 10 largest shareholders. They are not employees or kin to employees in firms which have over 5 % share of the listed company or in firms which are 5 largest shareholders.

Independent directors are required to publish reports about board meeting contents. A few studies using this dataset of reports to only focus on investigate negative opinions. Tang, Du, and Hou (2013) find that the stock market has a negative reaction to the disclosure of independent reports with negative opinions. The probability of receiving a negative report is higher in firms with more agency problems. Jiang, Wan, and Zhao (2016) show that independent directors who have higher human capital concerns are more likely to report negative opinions, whereas who have issued negative opinions will be reward with more directorships and lower possibility of regulatory sanctions. Consequently, stakeholders take actions to improve corporate governance following independent directors' dissension: cutting in inter-corporate borrowing, reducing bank loan, and dismissal CEO/Chairman (Jiang et al., 2016; Tang et al., 2013). Overall, these results suggest that independent directors' dissension are useful to protect the interests of outside stakeholders.

However, the amount of negative opinions is only 328 account for 1.15% in all 28634 reports from 2004 to 2012[23]. Each report comprises four parts, firm name, narratives to describe the proposal discussed at board meeting, identification of directors and meeting date. Ji, Taravela, and Yin (2016) use the full dataset to obtain the meeting frequency on different topics and find that the number of nomination and growth strategies meetings could alter the relationship between CEO turnover/compensation and firm performance. The results indicate that agreement reports includes information beyond the "negative opinions". Therefore, this study examines that whether the narratives in independent director report contain information content.

[23] The low dissension rate is not unique in China, which is around 2% in Israel firms (Schwartz-Ziv and Weisbach, 2013). In fact, director dissensions are hardly observed, the cases in China are precious to researchers who interested in board function.

4.3 Literature Review and Hypothesis Development

4.3.1 Disclosures of Management views and firm performance.

Literature in financial accounting that examine the textual disclosures or firm disclosures mainly focus on manager's views. They consider that managers make decisions depending on future firm performance, which based on more precise and complete information about their firms. Li (2010b) argues that the earnings quality intimated from managerial disclosures can be '*incremental or even superior to existing empirical measures*', since great information symmetry occurs between managers and outsiders. Empirical studies shows that the Linguistic patterns and textual analysis measures from management's views have prediction power on firm profitability, including CEO letter to Shareholder online (Segars and Kohut, 2001) and CEO forward-looking statements in annual reports (Li, 2010a), and management' views on firms' competitive environment (Li, Lundholm, and Michael, 2013). Therefore, it have been documented that manager's disclosures have significant connections with firm profitability and earning quality (e.g. Li, 2008, 2010a).

Overall, it is lack of evidence of the informativeness of director's disclosures. This may be because directors in developed markets only can express their opinion about firm performance and governance via annual reports. This type of disclosures is stylized and modified, so it may not show directors' communication patterns.

4.3.2 Tone of independent director reports and firm performance.

Independent director reports (IDRs) are an innovative source of corporate disclosures, which are issued by independent directors after board meetings. Independent directors could access private information which cannot been explained by financial data. However, they are often criticized for passive monitoring due to lack of independence and motivations to work diligently to mitigate agency costs (Tirole, 2010). However, directors have demand to protect/enhance their reputation by signaling their commitment to practice good corporate

governance so as to obtain more seats in listed firms. It has been suggested by theoretical and empirical results that reputation could be a strong incentive for independent directors to oversee firm operations (Fama and Jensen, 1983; Fich and Shivdasani, 2007; Levit and Malenko, 2016). Moreover, independent directors necessarily use independent reports to avoid legitimacy risk due to firms' or executives' illegal behaviours that damage shareholders' interests.

We expect that narratives in the reports include information about firm operations, and explore whether these reports cover information about future firm performance. Independent directors have negative (positive) information about firm operations or future strategies, the tone of IDRs should be negative (positive). We hypothesis that the tone of reports is positive associated to firm performance. The empirical examinations are a joint test of (a) whether independent directors provide information about the future in the reports, (b) whether they have different attitudes about future regardless majority of their opinions are "agreement" and (c) whether sentiment analysis method (combining Chinese word segmentation and machine leaning algorithm) capture the information in reports.

If the sentiment analysis method is able to measure the tone of independent directors, then evidence that the tone of IRDs predicts future performance is coherent with hypotheses that independent directors shows attitudes in their reports and IDRs have information contents. However, if the IDRs' tone based on our measure is not related to future performance, we cannot reject hypothesis (a) and (b) because the result can be because of the low power method applied.

4.3.3 Determinants of IDR's Tone

The content of reports relies not only naturedly on independent directors' characteristics, but also influenced by corporate governance and performance which is the foundation of directors' analysis.

Independent directors' motivations, experience and other characteristics.

Director's age and directorships are employed to proxy for director's reputation incentive for monitoring. Age could be a factor influencing directors' reputation concerns and directors behaviors (Zajac and Westphal, 1996). For example, young directors longer career plan, so they have more motivations to build reputation. Jiang et al. (2016) document that younger director are more likely to issue negative reports to reveal governance problems in serving firms. Directorships is the number of seats in for the director in listed companies, which has been widely used in empirical literature to capture the human capital in developed countries (Yermack, 2004). Ryan and Wiggins (2004) find that equity based compensation for independent directors are more effective in corporate governance, but it has not been broadly adopted in Chinese listed firms. We use all director's cash payments to measure monetary incentive.

Adams and Ferreira (2009) suggest that female directors are more likely to allocate more effects to monitor, in terms of better meeting attendance and joining more committees. Female on board could "push" male directors work harder as well. Hence gender diversity has a positive influence on board efficiency and firm outcomes. Gender diversity measured by the percentage of women in independent directors is employed. Other characteristics such as education level and working experiences are controlled as well.

Corporate Governance Indicators and Firm Features.

Empirical studies have explored a number of board characteristics which influence board monitoring and advising activities, then eventually affect corporate governance and firm outcomes. Liu et al. (2015) find comprehensive and robust evidence to support board independence has a positive effect on firm performance in China. Particularly, they document that independent directors have a positive impact on reducing insider self-dealing. The choice of optimal board size reflects tradeoff between costs of monitoring and benefits, and considers

the work efficiency as a group. Several studies examine the relationship between board size and firm performance and support that larger board size has a negative effect on firm value (Eisenberg, Sundgren, and Wells, 1998; Yermack, 1996). Remuneration, audit and nomination committee could meet more often than entire board, and function more efficiently because of higher independence, smaller size, and with associated expertise in the committee. Empirical studies basically support that various committees provide means to intense monitoring and have positive effects on lessening related corporate governance issues (Conyon and Peck, 1998; Klein, 2002; Shivdasani and Yermack, 1999). Although CSRC encourages listed firms to set up committees to accomplish corporate governance system, it does not mandate the number and type of committees should be established. Hence the number of committees is firm own decisions, and firms with more committees should have higher corporate governance quality. Board meeting frequency captures monitoring activities (Vafeas, 1999).

Firm size captures many properties of a company's business environment. Larger firms provide directors greater visibility, status (Adams and Ferreira, 2009), reimbursement (Ryan and Wiggins, 2004), and the possibility of gaining extra directorships (Yermack, 2004). One major role of independent director in China is to prevent tunnelling behaviour (related party transactions) and earnings manipulation in listed firms. Account receivables, as the main accrual anomaly, has been used as an instrument to manipulate earnings in China (Peng, Wei, and Yang, 2011). Abnormal account receivables could be negative related to the tone of reports. Ownership structure affects firm fundamental, such as firm performance, corporate disclosure transparency and CEO turnover in China (e.g. Kato and Long, 2006b). We use state-owned enterprise indicator, share owned by largest shareholder and the ratio of share owned by largest shareholder to the second largest to ownership effects. We also include standard firm performance measure – ROA and Tobin's Q and capital structure measure – leverage ratio.

4.4 Sentiment Analysis in Finance

4.4.1 Sources of Financial Narratives

The textual information in finance comes mainly from three sources: mandatory filings/public corporate disclosures (e.g., 10-Ks, 8-Ks annual reports, IPO prospectuses, etc.), media articles (e.g., Financial Times, newswire services, etc.) and internet messages (Kearney and Liu, 2014). Mandatory filings and public corporate disclosures are primary sources for researchers to know how insiders provide incremental information for firms. Previous studies explored disclosure characteristics through manual coding, which is hard to create a large-sample measure of disclosure quality. Li (2008, 2010) examines the readability to describe disclosure transparency and tone of corporate filings on the MD&A sections of 10-Ks and 10-Qs using quantitative textual analysis. The media articles contain the positive or negative tone, which affects to the economic case, the stock market and firms' performance. Tetlock, Saar-Tsechansky, and MacSkassy (2008) extract negative words from Wall Street Journal (WSJ) regarding S&P 500 companies that predict individual firms' accounting earnings and stock returns. García (2013) find that negative news has more impact on Dow Jones index during recessions. Ahmad, Han, Hutson, Kearney, and Liu (2016) show that media-expressed negative tone has no effect on firms' returns. Social media are a significant amount source of many people express their opinions about certain finance topics. Bollen, Mao, and Zeng (2011) create measurements of sentiment from millions of Twitter feeds are associated with the change of the Dow Jones Industrial Average (DJIA) over time. Each of narratives has its features; corporate disclosures deliver sentiment from top management, the information is specific and focusing on firms' level, while a source from social media has larger scale data but tends to be unreliable.

4.4.2 The approaches of Sentiment Analysis

Sentiment analysis is the computational research regarding tone or opinions of textual information using natural language processing. Sentiment analysis has been widely employed in detecting customers' reviews and analysing users' behaviours in social media. There are two standard methods for the sentiment analysis: dictionary-based approach and machine learning.

a) Dictionary-based Sentiment Analysis.

The dictionary-based approach uses a predefined dictionary of positive and negative words to match the words, phrases or sentences into groups (Also called 'bag-of-words' model). The most famous word lists are the General Inquirer (GI) built-in dictionary (Smith, Ogilvia, Stone, Dunphy, and Hartman, 1967). Other sources we can find such as the Linguistic Inquiry and Word Count (LIWC). There are also some dictionaries available to Chinese words, such as NTUSD Chinese sentiment dictionary.

To construct the sentiment measure through a dictionary method, we first need to tokenize the words or phrase in a corpus. After removing unnecessary stop words, such as a, the, and, before, will, etc. We classify the sentiment words from the dictionary (GI) and compute frequencies for sentiment words occurrence in the text. This simple case just takes account into equally weighted term sentiment. Loughran and Mcdonald (2011) use proportional weighting for each term inversely proportional to its document frequency, and employ GI negative words and the finance-specific word lists (L&M lists) to assess sentiment in 10-Ks and can briefly predict returns. The use of the finance-specific list can avoid unexpected effect and inaccurate result due to the same word has a different tone in various industries or topics. However, there is no available dictionary for the Chinese corporate disclosures. Thus, the dictionary-based approach may have less reliable and lower expectations.

b) Machine Learning

The machine learning method is to apply algorithms as a classification problem. We use a part of the complete corpus of textual data to train a classifier by the linguistic features, then

using the classifier to score the remaining corpus. The words in the training set are tokenized as “positive”, “negative”, or some other sentiment, for instance, “calm”, “tense”, “excited” and “upset” depends on circumstance. Pang, Lee, and Vaithyanathan (2002) employ three machine learning approaches -Naïve Bayes, support vector machines and maximum entropy, and found that the machine learning driven techniques have better performance than manual coding. The statistical inference picks up sentiment classification rules from trained set and applies to the whole textual data. For example, Li (2010) uses the Naïve Bayesian algorithm to classify the given sentence into a category from four predefined categories (positive, negative, neutral, and uncertain). The sentiment is positive if the probability of the sentence in the positive category is higher than in the negative, neutral and uncertain categories.

4.5 Methodology

4.5.1 Measure the tone of reports

In this paper, we employ the machine learning method driven by Naïve Bayes classifier. The main reason is lacking financial dictionary for Chinese word. The NTUSD only cannot provide a finance category of word sentiment. Therefore, the dictionary-based method could be not suitable to the financial report. For example, consider a sentence from the Chinese independent director report and translate into English “The asset has had good profitability and huge market potential, the attrition only occurs short-term, we still expect the company will follow the future development to provide a greater return for investors.” From NTUSD, the sentence has a lot of positive words (such as “profitability” and “greater”). But we can see that the tone should be negative. The dictionary-based approach just matches the sentiment words and does not consider the context of the sentences. The machine learning approach has the advantage of processing the particular textual data by constructing customised classifiers,

which can be trained efficiently under supervised learning. To calculate the measure of tone, we have two major steps. First, the words should be segmented, because the different combination of words may have the different tone for Chinese word. Then we employ Naïve Bayes classifier to train the corpus.

4.5.2 Chinese Word Segmentation

Unlike English corpus, segmentation is the most important procedure for Chinese word. There are several tools for the segmentation, e.g. Stanford Word Segmenter can split Chinese text into a sequence of words. Wang, Zong, and Su (2012) find the character based generative model have better performance for in-vocabulary (IV) words (observed before) and character based discriminative approach is more robust for out-of-vocabulary (OOV) words. Brants, (2000) indicate Trigrams 'n' Tags (TnT) is an efficient statistical framework for the tested corpus. We employ the character based generative model to comply word segmentation due to the highest accuracy rate in the dataset.

4.5.3 Text Classification Based on Naïve Bayesian Algorithm

In this paper, the Naïve Bayesian algorithm is employed for text classification. We use segmented words as terms to create a term-document matrix that describes the frequency of terms that occur in the given document, rows correspond to the occurrence of terms in the document and columns correspond to terms. For instance, given two simple sentences "I love apples." and "I hate apples." The column of term-document matrix is "I", "love", "hate", "apples", the frequency of the term "I" is 1 for both sentences, "love" is 1 for the first sentence and 0 for the second sentence. Then we can reduce the sentences to a list of words (d) by frequency in the sentences. The aim is to classify the sentence into a specific category (c) from a set of all predefined categories (positive, negative and neutral). Let $\{w_1, \dots, w_t\}$ be a predefined set of sentences with t features. Let $n_i(d)$ be the occurrence of w_i in document d,

we have the document vector $d = (n_1(d), \dots, n_t(d)$. So the best category can be described as $c^* = argmax_c P(c|d)$. Using Bayes' theorem, the conditional probability is

$$P(c|d) = \frac{P(d|c)P(c)}{P(d)}$$

Where $P(c)$ is the prior probability of a category, $P(d|c)$ is the prior probability that given document set is classified by a category. $P(d)$ is the prior probability that a given document set occurs. We assume all documents are independent, the problem is equivalent to:

$$P(c|d) = \frac{P(c) * P(w_1|c) * \dots * P(w_t|c)}{P(d)}$$

Since we have three categories, $P(d)$ has no effect in c^*. It can be eliminated. The equation can be rewritten as follows:

$$P(c|d) = P(c) * P(w_1|c) * \dots * P(w_t|c)$$

And the document categorization algorithm is described as

$$c^* = argmax_c(c) * P(w_1|c) * \dots * P(w_t|c)$$

The assumption is independence for each document that the probability of each word appearing in a document is unaffected by the presence or absence of each other word in the document. Although the conditional independence assumption is not true in the real case, the Naïve Bayesian algorithm has little effect on the results and still deliver accurate categorization (Lewis, N'edellec, and Rouveirol, 1998). Using Python code, we feed the pre-trained data provided by SnowNLP into the Bayes classifier and launch the training process. The measure of tone can be computed by predicting the probability of best category.

4.5 Sample

4.5.1 Prepare for data

Our sample contains data of non-financial main board firms listed on Shanghai and Shenzhen stock exchanges over the period from 2004 to 2012 from CSMAR database. CSMAR database has been used in research published in world leading journals. We select the period instead from 2002 because the amount of independent director reports disclosed increases largely after two year transition period.[24] Reports with disagree opinions (around 400) are excluded, which already indicate the "strongest" negative tone, yielded 23984 reports from 2004 to 2012. We generate the tone for each reports (*Tone_each*) that is a continuous variable, ranged from 0 to 1- negative view to positive and 0.5 means neutral. The average tone is 0.458 which is slightly negative (median 0.447) about future (proposals) in Panel A-Table 1. The slight negative sentiment is common in corporate formal disclose, for example, Li (2010) documents that the sentiment of the CEO forward-looking statement in management discussion and analysis of 10-K and 10-Q in the US.

For firm *i* with *k* reports in year *t*, we define its annual tone (*Tone_year*) as the average tone of all the reports in a firm by the learning algorithm:

$$Tone\_year_{i,t} = \frac{1}{K}\sum_{k=1}^{K} Tone\_each_{i,k,t}$$

$Tone\_year_{i,t}$ is created as the observations to with financial data yearly to test whether the tone of IDRs predicts future performance. The annual average tone is 0.463, similar with the individual tone. Then we define variable "*positive tone*", an indicator, equals one when the

[24] The Information Disclosure Standards (CSRC, 2005) further clarified the disclosure requirements, improving the quality and quantity of the reports. After 2005, the number of independent directors' reports increased accordingly. In the same time, the "Code of information disclosure for listed firms: Annual reports" (2004) enhance the timely disclosure of IDRs.

annual average tone for a firm is greater than 0.7, zero otherwise. Correspondingly, "*negative tone*" is a dummy variable, taking one when the annual average tone for a firm is smaller than 0.3, zero otherwise. The number of reports with negative tone (27.6%) is more than that of ones with positive tone (20.1%).

Financial and corporate governance data were also obtained from the CSMAR. To mitigate the influence of extreme values, all firm level data were winsorized at the top and bottom 1%. The final dataset includes 1437 firms and 11249 firm year observations.

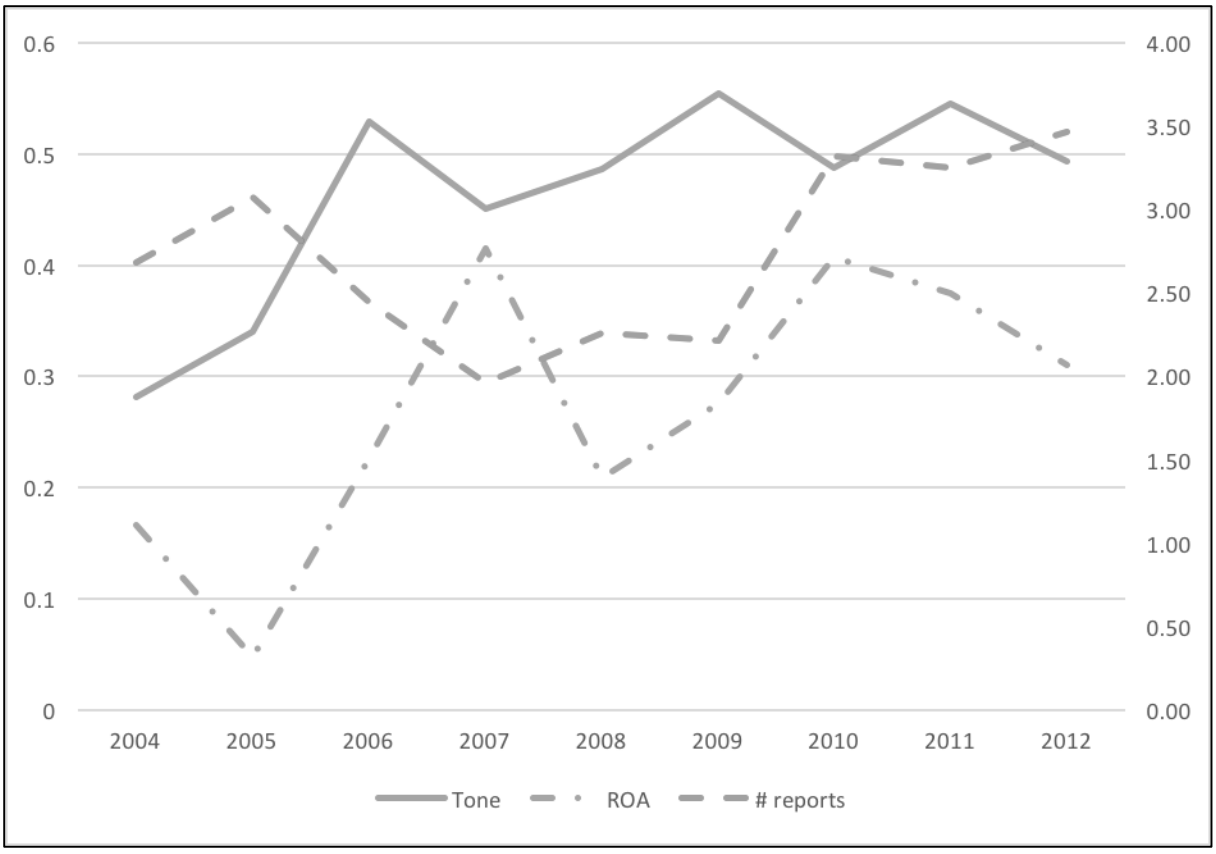

Figure 1. Trends of the tone and number of reports and firm performance.
The figure shows trends of features of independent directors reports and firm performance (ROA) over the period of 2004 – 2012. The tone of independent director report (annual mean) is a continuous variable, ranged from 0 to 1- negative view to positive and 0.5 means neutral. The number of reports is annual average of reports issued. ROA is annual average of corporate net income divided by total assets times 10 in order to see trend clearly.

Table 1

Variable definitions and descriptive statistics

This table shows all the descriptive statics and definitions of main variables for the sample of non-financial main board listed firm in Shanghai and Shenzhen Stock exchange over the period 2004 to 2012.

Panel A The Tone of independent director' reports

	Definition	Obs.	Mean	Median	S.D.	p5	p95
Tone_each	The tone of report[s], a continuous variable, ranged from 0 to 1 from negative view to positive; 0.5 means neutral	23984	0.458	0.475	0.447	0	1
Tone_year	The average of tones of reports in a firm	11249	0.463	0.500	0.303	0	1
Positive tone	Indicator variable takes one when tone_year is larger than 0.7	11249	0.201	0	0.401	0	1
Negative tone	Dummy variable, equals to one when tone_year is smaller than 0.3	11249	0.276	0	0.447	0	1

Panel B Independent directors' characteristics

	Definition	No. of firms	Mean	Median	S.D.	p5	p95
Age	The average age of independent directors in a firm	1437	51.755	51.333	6.258	42.000	63.000
Age_outside	Log value of Age	1437	3.939	3.938	0.121	3.738	4.143
Pay (1000 RMB)	The average monetary compensation of independent directors in a firm	1437	48	45	28.32	15	100
Pay_outside	Log value of Pay	1437	10.664	10.714	0.548	9.798	11.513
% female_outside	Ratio of women in independent directors	1437	0.138	0	0.199	0	0.5
Directorships_outside	The number of directorships	1437	1.893	1.714	0.786	1	3
Education_outside	The education level:5- Ph.D., 4-Master, 3-Bachelor, 2-College and 1-High School and lower	1437	4.025	4	0.656	3	5
Financial expert	Dummy variable, equals to 1 when a firm has at least one financial expert	1437	0.283	0	0.451	0	1
Law expert	Indicator variable, takes 1 when a firm has at least one law expert	1437	0.360	0	0.480	0	1

Panel C Board features

	Definition	No. of firms	Mean	Median	S.D.	p5	p95
Age_board	The average age of director	1437	49.166	49.222	3.885	42.800	55.444
# female	The number of female directors	1437	1.037	1	1.069	0	3
Board size	The number of directors	1437	9.350	9	1.914	7	13
Table 1 continued							
% independence	The share of independent director on board	1437	0.355	0.333	0.046	0.308	0.444
Number of committees	The number of committees	1437	3.349	4	1.369	0	4
Meeting frequency	The number of board meetings	1437	8.737	8	3.718	4	16

Panel D Firm performance and characteristics

		No. of firms	Mean	Median	S.D.	p5	p95
Log (total assets)	Log value of total assets	1437	21.641	21.536	1.117	20.024	23.694
SOE	Dummy variable equals to one when firm is controlled by state agent or state enterprises	1437	0.72	1	0.449	0	1
ROA (%)	The ratio of net income to total assets	1437	2.66	2.81	5.8	-7.5	10.72
Leverage	Debt over total assets	1437	0.524	0.527	0.236	0.185	0.819
Largest Share	The percentage of share held by largest shareholder	1437	37.744	35.897	15.03	16.148	63.74
Largest1to2	The ratio of share owned by largest over second largest	1437	24.820	6.220	62.220	1.130	101
Tobin's Q	Firm market value divided by firm value	1437	1.487	1.122	1.221	0.383	3.854

4.5.2 Descriptive Statistics for main variables

Figure 1 shows trend of the tone and number of reports and firm performance over the period from 2004-2012: the primary axis is for the tone – solid line and firm performance (ROA*10)[25]– dash-dot line; the secondary axis is for the number of report – Dash line. It represents that the number of IDRs per firm year is around 2 to 3.5. The tone at year 2004 and 2005 is more negative than ones at other periods, which is matching poor firm performance around 2004-2005. Trends of ROA and tone seem to have some similarity.

Panel B in Table 1 presents independent director's characteristics. The average age of independent director is 51.8 years, which is significant larger than the average age (49.2 in Panel C) of entire board by *t*-test. Annual payment is 48, 000 RMB (around 4,800 GBP). Females only account for 13.8% in independent directors. Almost one third of independent directors have working experiences in accounting and finance area (or law area).

Table 1 – Panel C and Panel D demonstrates board and firm features respectively. Generally, a board of a Chinese listed firm has 9 directors with one female, one third of who are independent directors. It has three committees and holds 9 meetings per year. 70% of listed firms are controlled or strong influenced by state, state agents or SOEs.

4.6 Model Design

4.6.1 Model (1): Examine the relationship between firm performance and the tone of IDRs

[25] Corporate ROA is around 0.5% to 4.1%, to compare it with the tone of reports that ranges from 0 to 1, ROA in the figure has been multiple by 10.

To examine whether the tone of IDRs predict future performance, we apply panel data analysis with firm, year, industry fixed effects using the following model:

$$FirmPerformance_{i,t} = Tone\_year_{i,t-1} + Controls_{i.t-1} \quad (1)$$

Where $FirmPerformance_{i,t}$ is measured as return on assets (ROA). The independent variable is $Tone\_year_{i,t-1}$ capturing the annual average tone of all the IDRs in firm *i* at year *t-1*. Independent and executive board members are a group to make business decisions, we control the board characteristics for capturing the factors that could influence their work efficiency: *age_board, #female, board size, % independence, number of committees* and *meeting frequency*. Firm status (*Log(total assets), ROA and Tobin's Q*), ownership structure (*SOE, Largest Share and Largest1to2*) and debtor's interests (*Leverage*) are controlled in $FirmControls_{i,t}$. The definitions of key variables are exhibited in Table 1.

Fixed effects estimators are applied for mitigating the heteroscedasticity and endogeneity issues of omitted variables and measuring errors by control unobserved firm invariance influenced, and time trends using year dummies. To partly mitigate simultaneity endogeneity issue, we use lagged values of independent and control variables to facilitate causality. We also estimate this model using IV and GMM method to further identification in robustness check section.

4.6.2 Model (2): Determinants of IDRs' Tone

Which factors affect the tone of independent director reports? An empirical examination linking the costs of independent directors and firm characteristics takes the following form:

$$Tone\_each_{i,k,t} = \beta\ IndependentFeatures_{i,t} + \gamma\ BoardContorls_{i,t} + \delta\ FirmControls_{i,t} \quad (2)$$

Where $Tone\_each_{i,k,t}$ is the tone of report k in firm i at year t. $\text{IndependentFeatures}_{i,t}$ is a vector of variables reflecting the features of independent director in firm i at time t. It mainly includes proxies for reputation concerns (*Age_outside and Directorships_outside*), the monitory incentive (*Pay_outside*), education and working experience (*Education_outside and Financial/ Law expert*). The empirical specification leads to omitted variable concerns, so our estimations apply firm, time and industry fixed effects are applied to control for firm and time heterogeneity polluting the coefficients of board characteristics to IDR's tone.

4.7 Empirical results

4.7.1 The Relationship between Firm Performance and the Tone of IDRs

In this section, we assess the implications of IDR's tone created by Chinese word segmentation and Naïve Bayesian machine leaning algorithm for a firms' future performance. We control the numeric financial information variables which have been explored in Chinese literature and documented to related to firm performance (e.g. Chen, Firth, and Xu, 2009; Liu et al., 2015; Ma, Naughton, and Tian, 2010). Thus it is used to provide evidence that the tone contains information content beyond financial information in annual report. Table 2 reports the results of panel data regressions with firm and year fixed effects from 2004 to 2014 to test whether the tone of IDRs could predict future performance (Model 2). The dependent variable is firm's probability – ROA, and lagged value of explanatory variables are employed. Column (1) and (2) of Table includes the IDR's tone and all the control variables, and Column (3) only involves control variables.

Table 2

Regression results of firm performance on the tone of independent director reports

	(1)	(2)	(3)
Tone_year $_{t-1}$	0.574***	1.602***	
	(0.198)	(0.379)	
Tone_year $_{t-1}$ × SOE $_{t-1}$		-1.446***	
		(0.402)	
Age_board $_{t-1}$	0.027	0.029	0.028
	(0.039)	(0.039)	(0.039)
Female_board $_{t-1}$	0.257***	0.260***	0.263***
	(0.099)	(0.098)	(0.099)
Financial expert $_{t-1}$	0.085	0.093	0.085
	(0.208)	(0.208)	(0.208)
Law expert $_{t-1}$	-0.300	-0.287	-0.298
	(0.210)	(0.209)	(0.209)
Board size $_{t-1}$	-0.040	-0.042	-0.038
	(0.080)	(0.080)	(0.080)
% Independence $_{t-1}$	5.594**	5.626**	5.652**
	(2.269)	(2.268)	(2.268)
Number of committees $_{t-1}$	-0.015	-0.020	-0.017
	(0.075)	(0.075)	(0.075)
Meeting frequency $_{t-1}$	0.029	0.028	0.031
	(0.024)	(0.023)	(0.024)
Log (total assets) $_{t-1}$	-1.970***	-1.960***	-1.969***
	(0.226)	(0.225)	(0.226)
SOE $_{t-1}$	-0.938*	-0.522	-0.948*
	(0.539)	(0.512)	(0.542)
Largest Share $_{t-1}$	0.106***	0.106***	0.106***
	(0.014)	(0.014)	(0.014)
Leverage $_{t-1}$	-0.975	-0.911	-0.997
	(0.914)	(0.911)	(0.917)
Firm and Year Dummies	Yes	Yes	Yes
Adjusted R-squared	9.1%	9.3%	9.0%
Observations	8866	8866	8866

This table reports the results of panel data regressions with firm and year fixed effects from 2004 to 2014 to test whether the tone of IDRs could predict future performance (Model 2). The dependent variable is firm's probability - ROA. Column (1) and (2) of Table includes the IDR's tone and all the control variables, and Column (3) only involves control variables.
* p<0.10, ** p<0.05, *** p<0.01

The coefficients of lagged *tone_year* in Column (1) and Column (2) are significantly positive, which indicates that the IDRs tone at least have one period prediction power. The coefficient magnitude is similar with that of CEO statement's tone in the US (Li, 2010a). One

major concern for list SOE is that the particular ownership may alter business operation and manage/director motivations. Specially, top management and directors in SOEs are more likely to have political connections or pursuing political status improvement. Hence, we introduce the interaction of *tone_year* and *SOE* to capture the difference between SOEs and non-SOEs in the relationship of the IDR's tone with firm performance in Column (2) of table 2. The coefficient of this interaction is negatively significant, which means that the tone in non-SOEs have higher prediction power than that in SOEs. Control variables have consistent sign and similar magnitudes coefficients in the models with and without *tone_year* variables. The coefficients of female_board and independence board are significant and positive, suggesting that more female directors and independent director on board are benefit for firm performance in line with literature (e.g. Liu et al., 2015). Listed SOEs and firms with larger assets are more likely have lower profitability. Moreover, the share owned by largest shareholder positively associates with firm performance.

We then substitute the *tone_year* with the *positive_tone* and the *negative_tone* indicator to estimate the relationship between the IDRs tone and future performance. Table 3 documents the regression results of firm performance on the *positive_tone* (Column - 1) and the negative tone (Column - 2) respectively. The *positive_tone* is positively related with firm performance, whereas the negative tone has a negative relationship with firm performance. The scale of coefficient of the negative tone in Column (2) is larger than the one of the positive tone in Column (1), which indicates that the negative tone contain more information content for predicting future performance. This may be because the key role of independent director's key role is monitoring required by CSRC, so they tend to pay attention to whether firm decisions are made according to related legitimate requirement. To protect themselves using IDRs, they will care more about the negative impacts on firm performance. To compare whether negative and positive tone have the same predictor power, regressions with standardised variables are

also employed to further check. The results similarly remains. Generally, the results from Table 2 and 3 support that there is a positive relationship between the IDR's tone and one period future firm performance.

Table 3

Regression results of firm performance on the positive and negative tone

	(1)	(2)
Positive tone $_{t-1}$	0.291**	
	(0.122)	
Negative tone $_{t-1}$		-0.334**
		(0.138)
Age_board $_{t-1}$	0.028	0.028
	(0.039)	(0.039)
Female_board $_{t-1}$	0.263***	0.256***
	(0.099)	(0.099)
Financial expert $_{t-1}$	0.084	0.087
	(0.208)	(0.208)
Law expert $_{t-1}$	-0.298	-0.299
	(0.210)	(0.210)
Board size $_{t-1}$	-0.039	-0.041
	(0.080)	(0.080)
% Independence $_{t-1}$	5.616**	5.600**
	(2.266)	(2.269)
Number of committees $_{t-1}$	-0.016	-0.016
	(0.075)	(0.075)
Meeting frequency $_{t-1}$	0.029	0.029
	(0.024)	(0.024)
Log (total assets) $_{t-1}$	-1.972***	-1.964***
	(0.226)	(0.226)
SOE $_{t-1}$	-0.946*	-0.940*
	(0.541)	(0.540)
Largest Share $_{t-1}$	0.106***	0.107***
	(0.014)	(0.014)
Leverage $_{t-1}$	-0.995	-0.988
	(0.916)	(0.914)
Firm and Year dummies	Yes	Yes
Adjusted R-squared	9.0%	9.1%
Observations	8866	8866

Table 4 documents the regression results of firm performance on positive_tone (Column - 1) and negative tone (Column - 2) respectively. Other variables are the same with ones used in Table 3. * p<0.10, ** p<0.05, *** p<0.01

To examine whether the tone have prediction power more than one period, Table 4 reports regression results including one year lagged and two year lagged positive tone (Column - 1) and negative tone (Column – 2) of IDRs. They are regressed on the determinants of the tone and year- firm fixed effects. The lagged one period positive / negative tone has significant relationship with current firm performance. However, the coefficients of two year lagged tone are not significant and obviously smaller, although they have same sign with one year lagged value. We estimate the relationship between more year lagged tone and current performance, regressing on three and four lagged tone, the coefficients also are not significant and the scale is even more smaller (nearly zero). Therefore, the IDR's tone is only related to one period future performance. It is reasonable based on the nature of independent director reports. Director's monitoring in related party transactions (over half of meeting proposals) which only affect short term assets/debts and earnings.

Table 4

The IDR's Tone and over one year firm performance

	(1)	(2)
$Positive\ tone_{t-1}$	0.278**	
	(0.139)	
$Positive\ tone_{t-2}$	0.033	
	(0.150)	
$Negative\ tone_{t-1}$		-0.282**
		(0.140)
$Negative\ tone_{t-2}$		-0.067
		(0.122)
Control variables	Included	Included
Firm and year dummies	Yes	Yes
Adjusted R-squared	9.0%	9.0%
N	7645	7645

Table 5 reports regression results including one year lagged and two year lagged positive tone (Column - 1) and negative tone (Column – 2) of IDRs. They are regressed on the determinants of the tone and year- firm fixed effects.
* p<0.10, ** p<0.05, *** p<0.01

Overall, we find that the average of IDRs' tone is positively correlated to future firm performance after controlling other factors that impact future performance. Hence, it shows that the tone includes information about firm performance, and tones are different in independent director's report with "agreement" opinion. It also supports that our measure for the IDR's tone is accurate.

4.7.2 Determinants of IDRs' Tone

In this section, we investigate which factors have relationships with the tone of independent director's reports at report level. Table 5 shows regression results with random effects based on model (1). The dependent variable is $Tone\_each_{i,k,t}$ in Column (1) and (2), the sentiment for report k in firm i at year t, regressed on its hypothesized determinants discussed in 2.3.1. The dependent variable is *negative_tone* in Column (3), whereas *positive_tone* in Column (4). The results in Column (3) and (4) are coefficients using logit estimator. Column (1), (3) and (4) of Table 5 include all explanatory variables, and Column (2) contains board controls and firm controls. We also estimate models with firm fixed effects, the untabalated results remain similar. Results with random effects are reported for two reasons: the result of Hausman test cannot reject the null hypothesis that the preferred model is random effects; in China, a huge proportion of listed firms (about 70%) are SOEs, this time invariant fundament difference may be related to the tone, which cannot be show in firm fixed effect models.

Table 5 Determinants of tone of independent director reports: director and firm level regressions

	(1)Tone_each	(2) Tone_each	(3) negative	(4) positive
Age_outside	-0.080**		0.382**	-0.405**
	(0.033)		(0.166)	(0.171)
Pay_outside	0.007		-0.042	0.009
	(0.008)		(0.038)	(0.038)
%Female_outside	-0.009		0.063	-0.056
	(0.018)		(0.090)	(0.092)
Directorships_outside	0.001		-0.003	0.003
	(0.002)		(0.011)	(0.012)
Education_outside	-0.001		0.010	-0.022
	(0.005)		(0.027)	(0.028)
Financial expert	-0.018**		0.103**	-0.049
	(0.008)		(0.042)	(0.042)
Law expert	-0.001		-0.011	-0.005
	(0.009)		(0.044)	(0.045)
Board size	0.003	0.002	-0.015	0.009
	(0.002)	(0.002)	(0.011)	(0.011)
% Independence	0.114	0.084	-0.713*	0.474
	(0.076)	(0.073)	(0.377)	(0.383)
Number of committees	0.009***	0.008***	-0.047***	0.048***
	(0.003)	(0.003)	(0.016)	(0.017)
Meeting frequency	0.002**	0.002**	-0.001	0.015***
	(0.001)	(0.001)	(0.005)	(0.005)
Log (total assets)	0.001	-0.000	0.005	0.009
	(0.005)	(0.004)	(0.023)	(0.024)
Account receivables	0.050	0.064	-0.236	0.266
	(0.043)	(0.041)	(0.212)	(0.218)
ROA	0.113	0.098	-0.329	0.722*
	(0.074)	(0.070)	(0.367)	(0.375)
Tobin's Q	0.003	0.002	-0.014	0.010
	(0.003)	(0.003)	(0.016)	(0.016)
SOE	-0.025***	-0.028***	0.089*	-0.172***
	(0.009)	(0.009)	(0.046)	(0.046)
Largest Share	-0.000	-0.000	0.001	-0.000
	(0.000)	(0.000)	(0.001)	(0.001)
Largest1to2	-0.000	-0.000*	0.001	-0.001*
	(0.000)	(0.000)	(0.000)	(0.000)
Leverage	-0.091***	-0.079***	0.397***	-0.375***
	(0.024)	(0.023)	(0.117)	(0.119)
Firm, industry and year dummies	Yes	Yes	Yes	Yes
Adjusted R-squared	5.42%	5.26%		
(Pseudo) R-squared			3.93%	3.65%
Observations	22244	23855	22238	22241

The table reports regression results with random effects based on model (1). The dependent variable is $Tone\_each_{i,k,t}$ in Column (1) and (2), the sentiment for report k in firm i at year t, regressed on its hypothesized determinants discussed in 2.3.1. The dependent variable is *negative_tone* in Column (3), whereas *positive_tone* in Column (4). The results in Column (3) and (4) are coefficients using logit estimator. Column (1), (3) and (4) of Table 2 include all explanatory variables, and Column (2) contains board controls and firm controls.* p<0.10, ** p<0.05, *** p<0.01

The tone of IDRs is influenced by independent director's characteristics. The Adjusted R-square in Column (1) is larger than the one in Column (2), indicating that modeling with independent director's characteristics have higher explanatory power. The coefficient of independent directors age is negatively significant in Column (1) and (4), while positive in Column (3). Thus age of independent directors has positive relationship with the IDR's tone. Younger independent directors are more (less) likely to issue reports with negative (positive) tone. It is consistent with our hypothesis that younger directors have more reputation concerns, so play a monitoring role more intensively. The coefficient of financial expert in Column (1) is significantly negative, while positive in Column (3), suggesting that independent directors with financial and accounting experience are more conservative when they issue reports, and have higher probability to issue negative reports. It supports the policy of adding financial expert on board to oversee firm risk.

In addition, several board and firm features impact the IDR's tone. The coefficients of number of committees are significant in all the columns, positive in Column (1), (2) and (4) while negative in Column (3), which implies that board with more committees have more positive tone. One explanation could be boards with more committees work more efficiently, so they have more information and confident about the firm, so the IDR's tone trend to be more positive. Another reason could be that the establishment of committees are not compulsory, so firms with more committees may have higher quality of corporate governance, and correspondently directors express more positive tone. Board activities, measured using meeting frequency, is positive associated with the tone (and the likelihood to obtain a positive report). However, the it is not related to the probability of receiving a report with negative tone. Ji et, al. (2006) shows that using meeting frequency cannot precisely capture board monitoring efforts, and Chen, Firth, Gao, and Rui (2006) also point out that meeting frequency tends to

have a positive relationship with firm and manager frauds. We do not claim a causality relationship between the tone and meeting frequency using our model, because these two variables are simultaneously determinate by corporate governance factors. Moreover, SOEs have reports with less positive tone. The leverage ratio has a negative impact on the IDR's tone, consistent with our hypothesis that firms with higher leverage ratio have higher bankrupt risk, so independent director will be more cautious to monitor firm operation and express less positive tone.

4.8 The IDR's Tone and the Necessities for Monitoring

Is the positive association between the tone of reports and firm performance perceived for firms with high risk and more monitoring need? If the answer of this question is "Yes", it does not only just deliver more evidence on the relationship, but provide important evidence that independent directors are not "passive" in their roles, in fact they acknowledge the issues in firms deeply. We hypothesis that the negative tone in poor performed or high risk firms contains "information" and significantly related to firm performance. To investigate this question, a sub-sample analyses are conducted where we attempt to separate between firms with relatively high and firms with relatively low monitoring needs. We expect that firms with higher liquidity risk (measured by Cash/short-term debt), greater bankruptcy risk (measured by total debt/ total assets) and poor performed are more likely to attract director' attention than other firms, so the negative tone in this firms is more strongly connected with future performance.

Table 6 reports regression results for each sub-sample. All regressions include the sets of control variables introduced in Section 4.2 with firm and year fixed effects. Panel A of Table 6 shows results for poor, median and good performance firms, respectively in Column (1), (2) and (3). For each firm-year, we firstly calculate the difference between ROA and the average

industry return. Then we rank firm performance by the sum of the difference over the number operating periods. The poor performed firms are defined as the lower third, median performed ones are the middle third, good performed firms are the higher third. Panel B and C document results for firms with low and high liquidity - Column (1) and (2), and firms with low and high bankruptcy risk – Column (3) and Column (4). The industry average of liquidity and leverage ratio are used to divide firms into related sub-samples. The regression coefficients of the negative and positive tone are reported briefly.

The results suggest that the negative relationships between the negative tone and firm future performance are observed for those firms that are likely to have more monitoring necessities from independent directors. These are the companies with poor performance, with above average leverage and with above average liquidity risk. However, the coefficients of the negative tone are insignificant in the sub-samples of companies with low monitoring necessities. Interestingly the coefficients of positive tone are not significant in all sub-samples except in good performed firms. This is because the reports of director report are required to disclose the proposal and their opinions, their responsibility is monitoring.

Overall, the results in Table 6 provide strong support that directors recognize the issues in listed firms, and use their reports to express some concerns although the degree of concerns is not serves enough to issue disagree opinion to the public.

Table 6 The IDR's Tone and The Necessities for Monitoring

Panel A

The predicting power of the IDR's Tone in firms with Poor, Middle or Good Performance

	(1) Poor performance ROA < Lower one third	(2) Middle Lower 1/3 <ROA < Higher 1/3	(3) Good performance ROA > Higher one third
Negative tone $_{t-1}$	-0.661**		0.008
	(0.263)		(0.160)
Positive tone $_{t-1}$	-0.087		0.466***
	(0.343)		(0.173)
Tone_year $_{t-1}$		0.549***	
		(0.211)	
Control variables	Included	Included	Included
Firm and year dummies	Yes	Yes	Yes
Adjusted R-squared	11.7%	9.6%	11.5%
N	2843	3004	3019

Panel B

The predicting power of the IDR's Tone in firms with liquidity and bankruptcy risk levels

	ROA			
	(1)	(2)	(3)	(4)
	Liquidity > Mean	Liquidity < Mean	Leverage < Mean	Leverage > Mean
Negative tone $_{t-1}$	-0.234	-0.452**	-0.214	-0.372**
	(0.161)	(0.212)	(0.187)	(0.180)
Positive tone $_{t-1}$	0.076	-0.023	0.219	-0.106
	(0.154)	(0.233)	(0.184)	(0.193)
Control variables	Includes	Includes	Includes	Includes
Firm and Year Dummies	Yes	Yes	Yes	Yes
R-squared	6.5%	10.3%	5.8%	10.1%
N	4330	4367	4209	4488

Table 6 reports regression results for each sub-sample. All regressions include the sets of control variables introduced in Section 4.2 with firm and year fixed effects. Panel A of Table 6 shows results for poor, median and good performance firms, respectively in Column (1), (2) and (3). For each firm-year, we firstly calculate the difference between ROA and the average industry return. Then we rank firm performance by the sum of the difference over the number operating periods. The poor performed firms are defined as the lower third, median performed ones are the middle third, good performed firms are the higher third. Panel B and C document results for firms with low and high liquidity - Column (1) and (2), and firms with low and high bankruptcy risk – Column (3) and Column (4). The industry average of liquidity and leverage ratio are used to divide firms into related sub-samples.

* p<0.10, ** p<0.05, *** p<0.01

4.9 Robustness check

From the trend in Figure 1, we can see that operations of Chinese listed firms are sluggish in 2004 and 2005 when the market was even worse than it in financial crisis around 2008. We also estimate using data over the period 2006 – 2012, the untabulated results do not alter.

Some empirical literature on board diversity (e.g. Carter et al., 2003) suggest the diversity of director could enhance firm value by offering more monitoring and resources, so we include Hence, we examine whether the diversity of independent directors affect the tone of IDRs by including age, rumination, education and directorship diversity[26] in the determinates of the IDR's tone (Model 1). The main results are similar, and the coefficients of these variables are not significant.

[26] Diversity is measured by standard method, the ratio of the standard deviation to the mean.

Table 7

Robustness check for the relationship between firm performance and tone of reports

	Firm performance (ROA)
Tone_year $_{t-1}$	3.203*
	(1.894)
Age_board $_{t-1}$	0.004
	(0.023)
Female_board $_{t-1}$	-0.009
	(0.072)
Financial expert $_{t-1}$	0.050
	(0.169)
Law expert $_{t-1}$	0.121
	(0.199)
Board size $_{t-1}$	-0.019
	(0.038)
% Independence $_{t-1}$	-3.394
	(2.171)
Number of committees $_{t-1}$	0.051
	(0.058)
Meeting frequency $_{t-1}$	-0.027
	(0.019)
Log (total assets) $_{t-1}$	0.712***
	(0.166)
SOE $_{t-1}$	-0.579***
	(0.176)
Largest Share $_{t-1}$	0.019**
	(0.008)
Leverage $_{t-1}$	-6.176***
	(0.631)
N	7644
P-value of LM statistic	0.105
Cragg-Donald F statistic	224.052
P-value of Hansen J statistic	0.223

Table 7 reports the results of regressing of firm future performance on the tone with IV-GMM estimator. industrial average board independence (one year lagged), the IDR's tone (one year and two lagged value), and independent director's age (one year lagged) are used as instruments. The regressions include the sets of control variables introduced in Section 4.2, errors are firm and year clustered.

Although we do not claim the casualty effect that the tone of director report can improve the future performance, endogeneity issues are still a big concern. We use IV-GMM method for further identification robustness check (Baum, Schaffer, and Stillman, 2007; Wooldridge, 2002). Following the literature about Chinese board (e.g. Liu, Uchida, and Yang, 2012), industry level of corporate governance factors could affect firm corporate governance, but will

not directly affect firm performance. Thus industrial average board independence (one year lagged), the IDR's tone (one year and two lagged value), and independent director's age (one year lagged) are used as instruments. Table 7 reports the regression results with IV-GMM estimator. The regressions include the sets of control variables introduced in Section 4.2, errors are firm and year clustered. The *p*-value of Hansen J statistic for over-identification test is 24.02%larger than 10%, so we cannot reject the null the joint null hypothesis is that the instruments are valid instruments, i.e., uncorrelated with the error term, and that the excluded instruments are correctly excluded from the estimated equation. The *p*-value of LM statistic for under-identifying restrictions is larger than 10.5%, implies that instruments are correlated with the tone. The C-D statistic is 224.052, which is larger than 5% critical value of Stock and Yogo test statistic, which indicate that our instruments are not weakly identified. Therefore, our IV-GMM estimator is valid and the relationship between the tone and future performance is unchanged.

4.10 Conclusion

This study analyzes the information content of independent director reports. These reports are proposed to disclosure independent director's evaluation on important business decisions based on firm's fundamentals. Whether these reports are informative is an open question. Although the content (narratives in reports) is based on the overall judgement of independent directors on the firm current and future operations, it might not be informative. Independent directors might be reluctant to indicate information about to which extent they agree or whether they have concerns. Especially directors mostly give agreement opinions when these concerns are not significant enough to let independent directors issue dissension opinions.

We employ Chinese word segmentation and Naïve Bayesian machine leaning algorithm to measure the tone of independent director report from more than 24, 000 records from 2004 to 2012. We find that the tone of IDRs is positively related to future performance. It has explanatory power incremental to other variables. The IDR's tone is associated with independent director's age, working expertise, the number of board committees, the board meeting frequency, state owned ownership and leverage ratio. We also argue that the negative tone of IDRs is negatively associated with firm performance for firms with greater monitoring necessities. Our findings are robust to a variety of robustness test.

Our results suggest that boards of directors have private information on firm profitability. The directors have capability and willing to disclose their opinion if they have a proper channel. The director disclosure could be used by outside stakeholders to monitoring firm operation. It also could be a mechanism for inspecting boards of directors' work diligence.

More and more researchers become to focus on board behavior and interactions among themselves and with management. Most of these studies rely on interviews and survey data, so empirical study with large sample in response to director's opinion or attitude is rare[27] due to data availability. This paper is the first to analyze the independent director disclosure using a statistical learning methodology using a large sampleset. Empirical analyses in this studies are joint assessments of the economic hypotheses and machine learning method. Our results show that this statistical learning algorithm can be used to Chinese corporative disclosure, which could be useful for future research.

---

[27] Studies that inspect board actions normally use extreme and clear specifications for board actions, for example, anti-takeovers (e.g. McWilliams & Sen, 1997) and CEO dismissals (e.g. Weisbach, 1988). Schwartz-Ziv and Weisbach (2013) observed board meetings of 11 Israeli firms and gain the private data on meeting minutes over period 2007-2009;

Reference

Adams, R. B., & Ferreira, D. 2007. A theory of friendly boards. *Journal of Finance*, 62(1): 217–250.

Adams, R. B., & Ferreira, D. 2009. Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics*, 94(2): 291–309.

Adams, R. B., Hermalin, B. E., & Weisbach, M. S. 2010. The role of boards of directors in corporate governance: A conceptual framework and survey. *Journal of Economic Literature*, 48(1): 58–107.

Ahmad, K., Han, J. G., Hutson, E., Kearney, C., & Liu, S. 2016. Media-expressed negative tone and firm-level stock returns. *Journal of Corporate Finance*, 37: 152–172.

Allen, F., Qian, J., & Qian, M. 2005. Law, finance, and economic growth in China. *Journal of Financial Economics*, 77(1): 57–116.

Baum, C. F., Schaffer, M. E., & Stillman, S. 2007. Enhanced routines for instrumental variables/GMM estimation and testing. *Stata Journal*, 7(4): 465–506.

Bollen, J., Mao, H., & Zeng, X. 2011. Twitter mood predicts the stock market. *Journal of Computational Science*, 2(1): 1–8.

Brants, T. 2000. TnT - A Statistical Part-of-Speech Tagger. *Proceedings of the Sixth Conference on Applied Natural Language Processing*, (i): 224–231.

Carter, D. A., Simkins, B. J., Simpson, W. G., Borokhovich, K., Crutchley, C., Elson, C., Fry, M., Hersch, P., Li, J., & Longhofer, S. 2003. Corporate Governance, Board Diversity, and Firm Value. *The Financial Review*, 38: 33–53.

Chen, G., Firth, M., Gao, D. N., & Rui, O. M. 2006. Ownership structure, corporate governance, and fraud: Evidence from China. *Journal of Corporate Finance*, 12(3): 424–448.

Chen, G., Firth, M., & Xu, L. 2009. Does the type of ownership control matter? Evidence from China's listed companies. *Journal of Banking and Finance*, 33(1): 171–181.

Conyon, M., & He, L. 2012. CEO compensation and corporate governance in China. *Corporate Governance: An International Review*, 20(6): 575–592.

Conyon, M. J., & Peck, S. I. 1998. Board control, remuneration committees, and top management compensation. *Academy of Management Journal*, 41(2): 146–157.

Eisenberg, T., Sundgren, S., & Wells, M. T. 1998. Larger Board Size and Decreasing Firm Value in Small Firms. *Journal of Financial Economics*, 48(1): 35–54.

Fama, E. F., & Jensen, M. C. 1983a. Agency problems and residual claims. *Jurnal of Law and Economics*, 26(2): 327–349.

Fama, E. F., & Jensen, M. C. 1983b. Separation of ownership and control. *The Journal of Law and Economics*, 26(2): 301–325.

Fich, E. M., & Shivdasani, A. 2007. Financial fraud, director reputation, and shareholder wealth. *Journal of Financial Economics*, 86(2): 306–336.

García, D. 2013. Sentiment during Recessions. *Journal of Finance*, 68(3): 1267–1300.

Hermalin, B. E., & Weisbach, M. S. 1998. Boards of directors as an endogenously determined institution: A survey of the economic literature. *American Economic Review*, 88(1): 96–118.

Jensen, M. C. 1993. The modern industrial revolution, exit, and the failure of internal control systems. *Journal of Finance*, 48(3): 831–880.

Jensen, M. C., & Meckling, W. H. 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4): 305–360.

Jiang, W., Wan, H., & Zhao, S. 2016. Reputation Concerns of Independent Directors: Evidence from Individual Director Voting. *Review of Financial Studies*, 29(3): 655–696.

Kato, T., & Long, C. 2006a. Executive turnover and firm performance in China. *The American Economic Review*, 96(2): 363–367.
Kato, T., & Long, C. 2006b. CEO turnover, firm performance, and enterprise reform in China: Evidence from micro data. *Journal of Comparative Economics*, 34(4): 796–817.
Kearney, C., & Liu, S. 2014. Textual sentiment in finance: A survey of methods and models. *International Review of Financial Analysis*.
Klein, A. 2002. Audit committee, board of director characteristics, and earnings management. *Journal of Accounting and Economics*, 33(3): 375–400.
La Porta, R., Lopez-De-Silanes, F., & Shleifer, A. 1999. Corporate Ownership Around the World. *The Journal of Finance*, 54(2): 471–517.
Levit, D., & Malenko, N. 2016. The Labor Market for Directors, Reputational Concerns and Externalities in Corporate Governance. *The Journal of Finance*, LXXI(2): 1–52.
Lewis, D. D., N'{e}dellec, C., & Rouveirol, C. 1998. Naive (Bayes) at Forty: The Independence Assumption in Information Retrieval. *Machine Learning: ECML-98*.
Li, F. 2008. Annual report readability, current earnings, and earnings persistence. *Journal of Accounting and Economics*, 45(2–3): 221–247.
Li, F. 2010a. The information content of forward- looking statements in corporate filings-A Na¨ıve bayesian machine learning approach. *Journal of Accounting Research*, 48(5): 1049–1102.
Li, F. 2010b. Textual Analysis of Corporate Disclosures : A Survey of the Literature. *Journal of Accounting Literature*.
Li, F., Lundholm, R., & Michael, M. 2013. A measure of competition based on 10-k filings. *Journal of Accounting Research*, 51(2): 399–436.
Liebman, B. L., & Milhaupt, C. J. 2008. Reputational sanctions in China's securities market. *Columbia Law Review*.
Liu, C., Uchida, K., & Yang, Y. 2012. Corporate governance and firm value during the global financial crisis: Evidence from China. *International Review of Financial Analysis*, 21: 70–80.
Liu, Y., Miletkov, M., Wei, Z., & Yang, T. 2015. Board independence and firm performance in China. *Journal of Corporate Finance*, 30: 223–244.
Loughran, T., & Mcdonald, B. 2011. When Is a Liability Not a Liability? Textual Analysis, Dictionaries, and 10-Ks. *Journal of Finance*, 66(1): 35–65.
Ma, J. 2013. Independent Directors ' Dissent on Boards : Evidence from Listed Companies in China Independent Directors ' Dissent on Boards : Evidence from Listed Companies in China *.
Ma, S., Naughton, T., & Tian, G. 2010. Ownership and ownership concentration: Which is important in determining the performance of China's listed firms? *Accounting and Finance*, 50(4): 871–897.
McWilliams, V. B., & Sen, N. 1997. Board Monitoring and Antitakeover Amendments. *Journal of Financial and Quantitative Analysis*, 32(4): 491–505.
Pang, B., Lee, L., & Vaithyanathan, S. 2002. Thumbs up?: sentiment classification using machine learning techniques. *Proceedings of the ACL-02 conference on Empirical methods in natural language processing - EMNLP '02*, 10(July): 79–86.
Peng, W. Q., Wei, K. C. J., & Yang, Z. 2011. Tunneling or propping: Evidence from connected transactions in China. *Journal of Corporate Finance*, 17(2): 306–325.
Ryan, H. E., & Wiggins, R. A. 2004. Who is in whose pocket? Director compensation, board independence, and barriers to effective monitoring. *Journal of Financial Economics*, 73(3): 497–524.

Schwartz-Ziv, M., & Weisbach, M. S. 2013. What do boards really do? Evidence from minutes of board meetings. *Journal of Financial Economics*, 108(2): 349–366.

Segars, A. H., & Kohut, G. F. 2001. Strategic communication through the World Wide Web: An empirical model of effectiveness in the CEO's letter to shareholders. *Journal of Management Studies*, 38(4): 535–556.

Shivdasani, A., & Yermack, D. 1999. CEO Involvement in the Selection of New Board Members: An Empirical Analysis. *The Journal of Finance*, 54(5): 1829–1853.

Simon, H. A. 1999. *Administrative Behavior, 4th Edition: a Study of Decision-Making Processes in Administrative Organization*. Free Press; 4Rev Ed edition.

Smith, M. S., Ogilvia, D. M., Stone, P. J., Dunphy, D. C., & Hartman, J. J. 1967. The General Inquirer: A Computer Approach to Content Analysis. *American Sociological Review*.

Tang, X., Du, J., & Hou, Q. 2013. The effectiveness of the mandatory disclosure of independent directors' opinions: Empirical evidence from China. *Journal of Accounting and Public Policy*, 32(3): 89–125.

Tetlock, P. C., Saar-Tsechansky, M., & MacSkassy, S. 2008. More than words: Quantifying language to measure firms' fundamentals. *Journal of Finance*, 63(3): 1437–1467.

Tirole, J. 2010. *The theory of corporate finance*. Princeton University Press.

Vafeas, N. 1999. Board meeting frequency and firm performance. *Journal of Financial Economics*, 53(1): 113–142.

Wang, K., Zong, C., & Su, K.-Y. 2012. Integrating Generative and Discriminative Character-Based Models for Chinese Word Segmentation. *ACM Transactions on Asian Language Information Processing*, 11(2): 1–41.

Warther, V. a. 1998. Board effectiveness and board dissent: A model of the board's relationship to management and shareholders. *Journal of Corporate Finance*, 4: 53–70.

Weisbach, M. S. 1988. Outside directors and CEO turnover. *Journal of Financial Economics*, 20: 431–460.

Wooldridge, J. M. 2002. *Econometric Analysis of Cross Section and Panel Data*. *MIT Press*. MIT Press.

Yermack, D. 1996. Higher market valuation of companies with a small board of directors. *Journal of Financial Economics*, 40(2): 185–211.

Yermack, D. 2004. Remuneration , Retention , and Reputation. *The Journal of Finance*, LIX(5): 2281–2308.

Zajac, E. J., & Westphal, J. D. 1996. Director Reputation, CEO-Board Power, and the Dynamics of Board Interlocks. *Administrative Science Quarterly*, 41(3): 507–529.