

**EXECUTIVE COMPENSATION, MANAGERIAL
OWNERSHIP AND BOARD CHARACTERISTICS IN
CHINESE LISTED COMPANIES**

BY

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the Degree of Doctor of Philosophy of Cardiff University**

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Abstract

Empirical research on executive compensation in China is very small compared to western countries, despite the fact that China is already the largest emerging economy. Moreover, most studies on executive compensation in China focus on the agency theory model and have produced mixed results. Little research on executive compensation has been done using alternative perspectives.

This thesis explores management incentive issues by examining executive compensation in Chinese listed companies from three under-researched perspectives: the managerial power model, tournament model and simultaneous model. All three models have been adapted to the Chinese context. The managerial power model tests executive compensation from the managerial power perspective. A new power dimension – political power – is added to Grabke-Rundell and Gomez-Mejia's (2002) managerial power model in order to test the political influence on executive compensation in Chinese listed companies. The research findings support the hypothesis that political duality, which refers to Chairman/Party Secretary duality, is positively related to executive compensation in Chinese listed companies.

The tournament model examines the organizational incentive structures. It studies the pay differences between organizational levels instead of studying the absolute level of pay, which provides an alternative incentive design other than the pay for performance mechanism. It is found that government ownership can weaken the tournament incentive in Chinese listed companies.

Finally, the endogenous nature of executive compensation has been largely neglected by previous studies. This study contributes to the literature by examining executive compensation, managerial ownership, board characteristics and firm value in Chinese listed companies in a simultaneous model. The research findings show that executive compensation, managerial ownership and board characteristics are jointly determined in Chinese listed companies. Specifically, small boards help to control Highest Paid Director (HPD) compensation, to align the interests between HPD and the company and to increase firm value. Independent directors also help to align the interest between the HPD and the company and to increase firm value. Political duality (Chairman/Party Secretary duality) fails to control HPD compensation but it helps to control board size.

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Chapter 1 Introduction

1.1 Introduction

Although China is already the largest emerging economy and the largest recipient of foreign direct investment (Peng, 2004), empirical studies on executive compensation in China are very few compared to studies on western countries. Among this small number of studies, large proportion comes from the perspective of agency theory, despite the fact that a wide array of theories based on economic, sociological and organizational study has been proposed in order to gain a better understanding of top executive incentives (Lambert, et al., 1993; Main, et al., 1993; Gomez-Mejia, 1994; Firth et al., 2006; Li et al., 2007).

This thesis sheds light on management incentive issues by examining executive compensation in Chinese listed companies from three under-explored perspectives: the managerial power model, tournament model and simultaneous model. The remainder of the chapter is organized as follows: section 2 presents the research background and motivations for the study; section 3 outlines the research objectives and research questions; section 4 describes the research methodologies; section 5 discusses the significance of this study; and section 6 presents the structure of the thesis.

1.2 Research Background

Gomez-Mejia (1994) argues that executive pay, as a mechanism of corporate governance in modern enterprises, is very important because of its effect on the firm's strategic choices, its fairness implications and its cascading impact on the compensation structure of the entire organization. Research on top management compensation has gone on for more than 70 years and has accumulated a vast number of studies. The most researched topic in this literature is the relationship between CEO compensation and firm performance from the perspective of the agency theory (Barkema and Gomez-Mejia, 1998). Agency theory argues that managers are self-serving and governance mechanisms, including the executive compensation structure, help to align the incentives of top managers with the interests of shareholders (Jensen and Meckling, 1976). However, the empirical evidence on this issue is still mixed (Finkelstein and Boyd, 1998). Barkema and Gomez-Mejia (1998) argue that researchers using different data sets, measurements of variables, statistical techniques and model specifications have often found weak or even statistically insignificant relationships between pay and performance.

In light of the mixed findings on the relationship between pay and performance, Tosi and Gomez-Mejia (1989) propose that researchers have ignored the process aspects of executive compensation, instead treating this complex organizational system as a 'black box'. Gomez-Mejia (1994) argues that it is amazing how little we

know about executive pay, in spite of the massive volume of empirical work available on this topic. Jensen and Murphy (1990) suggest that it is important to integrate agency theory with other models or to empirically test the explanatory value of alternative theories to agency-based models. Barkema and Gomez-Mejia (1998) propose that to move the executive compensation research forward requires greater effort to be devoted to examining alternative mechanisms and criteria on how top management compensation is set. Lambert et al. (1993) suggest that the generation of basic knowledge about internal wage structures is important for the development of a theory of organizational incentives. Most of the economics-based research on executive compensation uses principle-agent models. Agency research has largely addressed the design of incentive alignment issues in highly stylized settings. Such research, while conceptually important, has produced few empirically testable insights into how firms manage their promotion policies or select the structure of compensation for the total organization. The identification and testing of alternative compensation models other than the agency model can serve as a conceptual framework for organizations that are engaged in redesigning their incentive structures. Moreover, this type of inquiry can provide some initial insights into the validity of current critiques of executive compensation by the media, shareholders and academics.

Fan et al. (2007) argue that the past decade has seen a surge of interest in formerly planned economies such as China, Russia and Eastern European countries. Many of

the firms in these countries have adopted a corporate structure that resembles western business corporations, though with specific features inherited from a socialist background. Since these firms are operating in a context that is different from a mature market economy, certain current findings relating to western economies about the effectiveness of governance mechanisms may not apply. As the world's largest transitional economy and the largest recipient of foreign direct investment, Peng (2004) argues that more studies need to be done to know 'what is going on in China' if the field is to become globally relevant.

Over the last three decades, China has undergone a great economic reform and has been transformed from a central-planned economy to a socialist market economy. One of the key ingredients in the economic modernization of China has been the corporatization of State Owned Enterprises (SOEs) and the listing of some of them on the Shanghai and Shenzhen stock exchanges since the early 1990s. With the corporatization and privatization of SOEs, managers are given more autonomy in making business decisions to maximize profitability. A key factor in ensuring the success of firms is the design of incentives that induce managers to increase profits and enhance the value of the business (Firth et al., 2006).

The literature on top executive compensation in Chinese listed companies has been growing since 1998, when listed companies were required to disclose top executive compensation by the China Securities Regulation Committee (CSRC). However,

empirical studies on executive compensation in China are very few compared to studies on western countries (Peng, 2004). Moreover, similar to western literature on executive compensation, most of the compensation studies in China are from the perspective of agency theory, despite the fact that a wide array of theories based on economic, sociological and organizational study has been proposed in order to gain a better understanding of top executive incentives (Lambert, et al., 1993; Main, et al., 1993; Gomez-Mejia, 1994; Firth et al., 2006; Li et al., 2007). Only a few empirical studies has examined the ability of these alternative models, for example, the managerial power model, to explain organizational incentives in Chinese listed companies which have special social and institutional backgrounds. Moreover, most studies only focus on CEO compensation. Little has been done to examine the compensation structure of the lower-level executives and its relationship to top-level executive compensation (Lambert et al., 1993). Finally, the scope of current studies on executive compensation is limited in that they do not fully explore the simultaneous nature of the process determining executive compensation.

The following research gaps have been discovered and provide the motivation for this study. Firstly, within the limited Chinese studies on executive compensation, the direct political influence on executive compensation is largely neglected. Managerial power model incorporate behavioral conjectures of power into the agency theory framework, in order to provide an alternative approach towards explaining executive pay (Grabke-Rundell and Gomez-Mejia, 2002). Recently a few researchers have

examined the relationship between executive ownership power and compensation in China (Chen 2006; Li et al. 2007). However, there are no studies of how other sources of power, such as political power, affect executive compensation in Chinese listed companies.

Secondly, similar to executive compensation research in western countries, executive compensation studies in China started with the study of the pay-performance relationship in Chinese listed companies. The use of the tournament theory to explain executive compensation is an under-researched area (Eriksson 1999; Conyon et al. 2001). Tournament theory focuses on a group of agents who compete for a fixed prize and are rewarded on their relative performance. An application of tournament theory is using it to model the competition among senior executives to become CEO (Conyon et al., 2001). Tournament theory is a reduced form of the agency model, in that the managers work for a principal who is pre-committed to a compensation contract. In order to provide adequate incentives, it may be necessary to engineer extremely large salary differences among the top executive directors (Lambert et al., 1993; Main et al., 1993). Little has been done on the application of the tournament model in China. Does the structure of executive compensation in Chinese listed companies follow the tournament model? Can a compensation structure based on the tournament model, as suggested by the tournament theorists, help to promote firm value in China? These questions remain unanswered.

Thirdly, many researchers argue that ownership structure, executive compensation structure and board composition are determined by each other and by the nature of a firm's business. These variables also influence a firm's performance (Jensen and Meckling, 1976; Mehran, 1995). Recently, several studies have examined the relationship between executive compensation and board characteristics in Chinese listed companies (Firth et al. 2007; Li et al. 2007). However, these studies do not fully explore the simultaneous nature of the process determining executive compensation, executive ownership, board structure and firm value.

1.3 Research Questions and Research Objectives

Following the above analysis, the purpose of this thesis is to investigate the determinants of executive compensation in China, drawing on three under-researched perspectives: the tournament theory, managerial power theory and simultaneous framework. In particular, this thesis explores the following research questions:

1. What is the influence of executive power on executive compensation in Chinese listed companies, based on the perspective of the managerial power model?

Managerial power model predict that executive compensation is positively related to executive power (Grabke-Rundell and Gomez-Mejia, 2002). Taking into account

the Chinese context, a new power dimension (political power) referring to Party Secretary/Chairman duality has been included. Based on the managerial power model of Grabke-Rundell and Gomez-Mejia (2002), this study explores the impact of executive structural power and political power on executive compensation.

2. Does the compensation structure of executive directors in Chinese listed companies follow the tournament model? Can a compensation structure based on the tournament model improve firm performance in Chinese listed companies?

The tournament model predicts that the relationship between executive compensation and organizational level is convex; that the tournament prize (the pay gap between the CEO/highest paid director and the average executive team) increases with the number of contestants and that firm performance is positively related to executive pay dispersion. This study aims to test all three propositions of the tournament model in Chinese listed companies. Specifically, it explores whether the structure of executive compensation in Chinese listed companies follows the tournament model, and whether the relationship between firm performance and compensation structure is based on the tournament model.

3. How do executive compensation, executive ownership and board characteristics affect each other and how do these factors eventually affect

firm value in the simultaneous model in Chinese listed companies?

Many researchers emphasize the endogenous relationship between executive compensation, executive ownership, board structures and firm value (Jensen and Meckling 1976; Mehran 1995; Chung and Pruitt 1996; Core et al. 1999). This thesis has adapted the simultaneous model to the Chinese business context and explores the dynamics and interactive nature between these governance mechanisms and firm value in the simultaneous model.

4. Do factors such as political influence and government ownership influence executive compensation in Chinese listed companies?

Taking into account the unique Chinese institutional background, this study also aims to explore the impact of other factors such as political influence and government ownership on executive compensation in Chinese listed companies.

1.4 Research Methodologies

In this thesis, quantitative methods are employed to analyze the executive compensation structure and the determinants of executive compensation in Chinese listed companies. The data is drawn from a sample of 71 Chinese companies listed on the Chinese stock exchanges for the period 1998-2001. The data includes cash

compensation, executive shareholdings, age, gender, tenure of each of the top 3 highest paid directors and board characteristics. The financial data of Chinese listed companies comes from the Sinofin database. Two datasets are used in the statistical analysis: the first dataset includes the 779 top 3 highest paid directors in the 71 Chinese listed companies. The second dataset includes the 284 highest paid directors in the 71 Chinese listed companies. The first dataset is employed to examine research questions 1 and 2. The second dataset is employed to test research questions 3, 4 and 5.

Three regression methods are employed: robust regression with standard errors clustered by firm, fixed-effects or random-effects models and Three-stage Least Squares (3SLS). Robust regression with standard error clustered by firm alleviates the problem of possible biased OLS standard errors. Panel data regressions (fixed-effects or random-effects models) are more efficient than OLS regression in that they control for firm heterogeneity; they give more informative data, more variability, less collinearity among the variables and more degrees of freedom (Baltagi 1995). To capture the simultaneous nature of the relationships among executive compensation, executive ownership, board characteristics and firm performance, a three-stage least squares (3SLS) regression is employed to estimate the simultaneous model (research question 4). Finally, regression diagnostics and robustness are checked for all the models.

1.5 Significance of the Study

Most studies on executive compensation in China focus on the agency theory and produce mixed results. Little research on executive compensation has been done using alternative perspectives. This thesis sheds light on top management incentives and executive compensation from three alternative models: the managerial ownership model, tournament model and simultaneous model. All three models have been adapted to the special Chinese institutional and business background. This study differs from other executive compensation research on Chinese listed companies in the following ways.

Firstly, top executive directors in most Chinese listed companies are appointed by the government. Many researchers have studied the effects of government ownership on executive compensation in Chinese listed companies but failed to find consistent results (Chen 2006; Firth et al. 2006; Li et al. 2007). The direct political influence on executive compensation in Chinese listed companies has been examined for the first time by adding a new dimension - political power - to the managerial power-compensation model of Grabke-Rundell and Gomez-Mejia (2002). I propose the notion of political duality, which is that the Chairman also serves as the (Chinese Communist) Party Secretary of the company, as an important explanatory variable of executive pay. Executive compensation is predicted to be positively related to his/her political power. Therefore this is the first study to examine the effect of direct

political/government intervention on executive compensation in Chinese listed companies.

Secondly, compensation and incentive structures of top managers in Chinese listed companies are not well understood, yet they are crucial in determining the success of the Chinese reforms (Firth et al. 2006). The tournament model examines the organizational incentive structures. It specifically studies the pay differences between organizational levels instead of studying the absolute level of pay. Therefore the tournament model provides an alternative incentive design other than the pay-for-performance mechanism. This thesis is the first study to test all three propositions of the tournament model. More importantly, the tournament model has been adapted to the Chinese context based on the notion of political reward. Political reward is an important non-cash incentive in Chinese listed companies with high government ownership, therefore tournament (cash) incentives would be weakened in more government-controlled companies.

Thirdly, researchers argue that executive compensation, managerial ownership and board characteristics are jointly determined (Jensen and Meckling 1976; Chung and Pruitt 1996). However, this endogenous nature of executive compensation is largely neglected in previous empirical studies in China. This is the first study to explore this issue and I have extended Chung and Pruitt's (1996) simultaneous model on executive compensation by adding 4 board characteristics variables (board size, board duality,

board composition and executive political duality) as endogenous variables. Political duality, which represents the Chairman/Party Secretary duality, is included in the simultaneous model as an important endogenous variable. The author hopes that this study leads to a better understanding of executive compensation in China.

1.6 Structure of Thesis

The remainder of the thesis is organized as follows: chapter 2 provides the institutional background in China. Firstly, it presents the legal framework of Chinese corporate governance. Secondly, it describes the ownership structure of Chinese listed companies. Thirdly, it presents the current corporate governance practices of Chinese listed companies, which include executive compensation, managerial ownership and board characteristics.

Chapter 3 provides descriptions of the theoretical frameworks of the managerial ownership model and tournament model. Part I reviews the literature on the managerial power model and extends it to the Chinese context. Part II reviews the literature on tournament theory, followed by a review of the empirical findings of the tournament model. The application of the tournament model in the Chinese context is discussed, followed by a discussion of the limitations of the tournament model.

Chapter 4 contains a review of literature on the simultaneous model of executive

compensation, managerial ownership and board characteristics. Firstly, it reviews the theoretical and empirical literature on the determinants of executive compensation from various perspectives. Secondly, it provides a review of literature on managerial ownership. Thirdly, it presents a review of literature on board characteristics. Finally, it reviews the literature on the simultaneous relationship of executive compensation, managerial ownership and board characteristics.

Chapter 5 presents the development of the five research hypotheses of this study. It starts by developing a research hypothesis related to the managerial power-compensation model in the Chinese context. Then it presents the development of three hypotheses related to the tournament model and executive compensation in the Chinese context. Finally, it develops the hypothesis related to the simultaneous model of executive compensation in China.

Chapter 6 presents the research models employed in this study. The research methodology, methodological concerns and limitations of previous studies are discussed. It then introduces the sample selection process and data collection, followed by the measurement of the variables used in the study. Finally, it presents the quantitative method employed for the data analysis.

Chapter 7 provides the preliminary data analysis of this study. The variable characteristics and correlation analysis are presented. Firstly, it presents the

descriptive statistics of the key variables. Then it checks the variables for any violation of the assumptions underlying the statistical/econometrical techniques which are used to address the research questions. Finally, the correlation analysis of the key variables used in the empirical analyses is presented.

Chapter 8 provides a detailed regression analysis on the three executive compensation models: the managerial power model, tournament model and simultaneous model. Regression analysis results of each model are presented and compared with previous empirical literature. Finally, the regression diagnosis and robustness check for all three models are presented.

Chapter 9 provides a summary of empirical results and links the results to research hypotheses, previous literature and the Chinese institutional and social background. Firstly, it summarizes the research hypotheses and empirical findings. Secondly, it discusses the empirical results and implications of the managerial power model. Thirdly, it discusses the empirical results and implications of the tournament model. Finally, the empirical findings and implications of the simultaneous model are discussed.

Chapter 10 concludes the whole thesis with a summary of the empirical findings, contributions, theory and policy implications for academics and policy makers, limitations of this research and future research agenda.

Chapter 2 Institutional Background in China

2.1 Introduction

The transition from a central planned economy to a market economy in China started at the end of 1978. The transition has turned China from a poor and inward-looking economy to one of the most dynamic economies and largest trading powers in the world (Lin and Tan, 1999). When Deng Xiaoping and his comrades began the economic reform in 1978, none (including Deng himself) expected to witness a nearly double-digit annual growth rate in the subsequent two decades and a predominant non-state sector (Li et al., 2000).

China's economic reform has evolved in two stages. The first stage is from 1978 to 1993 and the second stage is from 1993 to the present day. The focus during the first period of economic reform was on reintroducing markets and incentives within the domain of direct state ownership and control (Tenev et al, 2002). Between 1978 and 1993, growth in the Chinese industrial sector was very fast but private ownership and control of firms played only a minor role. The growth engine of the economy did not come from old State-Owned-Enterprises (SOEs) but from new non-state enterprises, especially rural 'collective' enterprises known as Township-Village Enterprises (TVEs). Other types of non-state and non-private firms include joint ventures between

the government and foreign investors and stock companies in which the government owns major shares (Qian, 2000).

In the spring of 1992, Deng Xiaoping made his famous Southern China Tour to mobilize local support for further and more radical economic reform. After that, at the 14th Chinese Communism Party's (CCP) Congress held in September 1992, for the first time, the CCP endorsed the 'socialist market economy' as China's goal of reform (Qian and Wu, 2000). The period since 1993 has been marked by important changes in China's overall approach to economic reforms. In November 1993, the Third Plenary Session of the 14th CCP's Congress issued the 'Decision on Issues Concerning the Establishment of a Socialist Market Economic Structure', in which there were two points particularly important to the reforms of SOEs. The first was the creation of a 'modern enterprise system', with its corporate structure, governance and management based on the principle of corporatization, and with provision for full separation of the State's exercise of ownership rights from the enterprise's exercise of legal person property rights. The second encouraged the development of diversified forms of enterprise ownership, including 'privately owned, individually owned, and foreign-invested' enterprises (Tenev et al, 2002).

Schipani and Liu (2002) propose that the reform of SOEs also accelerated the process of corporate legislation, which was perceived as an essential legal instrument for corporatizing SOEs. The Company Law, promulgated in November 1993,

provides legal underpinnings for the concept of a modern enterprise system. For the first time, The Company Law provides a legal foundation for the establishment and operation of companies. It provides rules for the incorporation of all enterprises of different ownership types into limited liability shareholding companies and specified governance structures and rules regarding the transfer and sales of shares, and procedures for mergers and bankruptcy (Tenev et al, 2002).

In 1984, 11 SOEs became shareholding enterprises through a process called shareholding transformation. By the late 1980s, another handful of SOEs had undergone the shareholding transformation. Stock exchanges emerged in a number of cities. In 1991, 8 and 6 companies were publicly listed in the Shanghai and Shenzhen Stock Exchange respectively, which marked a new stage of the Chinese capital market. Soon after that, the Chinese stock market developed rapidly. By August 2004, 1380 companies had been listed on the two stock exchanges. The total market capitalization was RMB 3903.1 billion (US\$ 471.6 billion), equivalent to 28.6% of GDP (US\$ 1649.3 billion). Most Chinese listed companies are State-owned enterprises. These enterprises had raised more than RMB 1222.3 billion (US\$ 147.7 billion) from the Chinese stock market, which helped them improve their financial condition, promote their research and development and expand their profit bases.

Over the last ten years, China has made significant progress in developing the institutional foundations of a modern corporate governance system. More than 80% of

all small and medium enterprises have been privatized, with a significant portion sold to employees and external investors. About 1380 large companies (mostly state-owned) have diversified their ownership through public listing. A basic legal framework has been established. The financial system has become more diversified and less dependent on political influence. The China Securities Regulatory Commission (CSRC) and the State Economic and Trade Committee (SETC) have introduced the independent directors systems in the listed companies and the Code of Corporate Governance for both listed and non-listed companies. However, there is a further need to improve the corporate governance practices in Chinese companies (Tenve et al., 2002).

The remainder of this chapter is organized as follows: Section 2 discusses the legal framework of Chinese corporate governance. Section 3 describes the ownership structure of Chinese listed companies. Section 4 examines the current corporate governance practices of listed companies in China. Section 5 describes executive compensation and incentive schemes in China. Section 6 presents features of boards of directors in China, followed by a brief summary in Section 7.

2.2 The Legal Framework of Corporate Governance in China

The biggest challenge for China to complete its market transition is the establishment of rule by law. The economic advantages of rule by law over ad hoc

arrangements are transparency, predictability and uniformity, which reduce idiosyncratic risks, rent-seeking, corruption and ultimately reduced transaction costs (Qian, 1999).

2.2.1 The SOEs Law of 1988

Before 1984, state ownership was generally assumed to be the only legal form available to provide a safeguard for state property. Unfortunately, the concept of state ownership not only depressed the growth of the private sector in China but also deprived SOEs of economic and legal independence. The SOEs' executives were required to fulfill the production plans of the central or local government rather than enhance profits for the state investor. The term 'corporation' or 'legal person' did not exist in China during the central-planning period. SOEs' executives were appointed and dismissed by government agencies and enjoyed the same political and economic treatment as government officials (so called 'State Cadres'—Guojia Ganbu). The objective of the SOEs' reforms in the 1980s was to make SOEs responsible for their own gains and losses in the market: 'SOEs should become legal persons that enjoy full management authority and full responsibility for their own profits and losses' (the SOEs Law, 1988). To accomplish the reform objectives, the State-Owned Industrial Enterprises Law of China was passed in 1988 (the SOEs Law) (Schipani and Liu, 2002).

2.2.2 The Company Law of 1993

Between 1987 and 1993, the Contract Responsibility System was adopted in many SOEs. According to the Contract Responsibility System, the two parties on the contract are the government agency and the SOE, as represented by its CEO. The CEOs of SOEs are selected through a competitive process. They act as the legal representatives of the SOEs and take full responsibility for their management. The basic principle of the contracting system was to lock the minimum amount that the SOEs should pay to the state and entitle the SOEs to keep the remaining profit, but remain liable for paying the fixed amount to the State even if the SOEs had not made satisfactory profit (Schipani and Liu, 2002). Although these reforms had some positive initial impact on improving SOEs' efficiency, problems began to emerge in the early 1990s because of the lack of a legal system protecting the rights of the property owners.

The reform of SOEs in the early 1990s reflected a desire to build a modern enterprise system compatible with the market economy. After Deng Xiaoping called for an introduction of the market economy in China in 1992, one of the official goals of the reform of SOEs was to set up a modern corporate system in large and medium-sized SOEs (Decision on the reform of SOEs, 1999). The policies on reform of SOEs also accelerated the process of corporate legislation, which was perceived as an essential legal instrument for corporatizing SOEs (Schipani and Liu, 2002). The Company Law of 1993 was the first comprehensive piece of legislation on business

corporations since the founding of the People's Republic of China in 1949. It provides legal foundations for the transformation of SOEs into different business corporations, including wholly State-owned corporations, closely held corporations (which includes wholly foreign-invested enterprises and Chinese-Foreign Joint Ventures) and publicly held corporations. The Company Law requires corporations to form three statutory and indispensable corporate governing bodies: (1) the shareholders, acting as a body at the general meeting; (2) the board of directors and (3) the board of supervisors. In addition, the Company Law introduced two new statutory corporate positions: Chairman of the board of directors and the CEO (the two positions can be combined into one person).

2.2.3 Code of Corporate Governance for Chinese listed companies of 2001

The Code of Corporate Governance for Listed Companies (hereinafter referred to as 'the Code') is formulated to promote the modern enterprise system, to standardize the operation of listed companies and to bring forward a healthy development of the securities market in China. The Code sets forth the basic principles for corporate governance of listed companies in China, the means for the protection of investors' interests and rights and the basic behaviour rules and moral standards for directors, supervisors, managers and other senior management members of listed companies. The Code generally follows the western corporate governance standards, for example, it introduces independent directors and incentive pay to Chinese boards of directors.

The Company Law in China has no mandatory requirements for appointing either external directors or independent directors in large publicly-held companies. The Code calls for the introduction of independent directors in domestic-listed companies for the first time. Furthermore, in August 2001, the China Securities Regulatory Commission issued 'Guidelines for Introducing Independent Directors to the Board of Directors of Listed Companies'. According to the guidelines, 'at least one of the independent directors should be an accounting professional (refers to personnel with a senior professional title or certified public accountants). By June 30th 2002, at least two members of the board of directors shall be independent directors; and by June 30th 2003, at least one third of the board shall be independent directors' (the Guidelines, 2001).

The Code also introduces an incentive pay scheme for managers. 'To attract qualified personnel and to maintain the stability of management, a listed company shall establish rewarding systems that link the compensation for management personnel to the company's performance and to the individual's work performance' (the Code, 77).

In addition to a board of directors, the Code introduces a supervisory board to Chinese listed companies as well. Schipani and Liu (2002) argue that the Chinese corporate governance structure may appear similar to the German two-tier system of corporate governance at first glance. However, there are substantial differences

between the German and Chinese systems of corporate governance. For example, in China, there is no hierarchical relationship between the board of directors and the board of supervisors, and both directors and supervisors are appointed by, and may be dismissed by, shareholder action. By contrast, the German supervisory board oversees the board of directors, and the members of the board of directors are appointed by, and may be dismissed by, the board of supervisors.

2.3 Ownership Structure of Chinese Listed Companies

The most important feature of the Chinese stock market is the dominant role of state ownership. In China, an enterprise wishing to issue stocks may select to arrange either a private placement or a public offering. In a private placement, an enterprise sells its stocks only to a few designated investors, such as employees, financial institutions or other enterprises closed to the issuers. Shares issued by a typical SOE consist of three types: state shares, legal person shares and individual shares. State shares and legal person shares comprise the majority of total shares. Employee shares account for only a small part of the total issuance. Public offering in China is quite similar to western practice. Before 1997, the China Securities Regulatory Commission (CSRC), the State Planning Committee, the State Economic System Reform Commission and the People's Bank of China jointly determined the annual stock issuance, which stipulated the total number of new stocks to be listed on the exchange. With the governmental reform, CSRC became the most powerful organization with

regard to the authorization and supervision of stock listing and issuance.

Because the Chinese stock market is still in its infancy, accession to the market has therefore been strictly controlled concerning the checking and approval system and quota system. For a long time, the number of stocks to be listed was limited by the quota. In March 2000, the State Council promulgated the Rules on Approval for Stock Issuance, the quota system was abolished and the checking and approval system was also abolished under the new Securities Law. According to the new Rules, the securities companies select the candidate issuers and then recommend them to the CSRC with the approval of local government.

The ownership and governance characteristics of Chinese listed companies are largely shaped by the past incentive structures of the listing process. The government introduced stock markets partly as a means of transforming the state sector under the quota system. Local governments were responsible for selecting which companies were to be listed. Local governments tended to give preference to companies that were under their control, urgently needed capital infusion, or were otherwise socially or economically important. Such criteria would not necessarily result in the selection of the most dynamic, successful and high-growth companies. They also created a bias against private sector companies (Tenev et al, 2002). In addition, Chen and Shih (2001) argue that the methods by which stocks are listed and shares issued in Chinese stock markets violate the market principle. Equity in listed companies is artificially

divided into different categories of shares in the same stock that have different rights - state shares, legal person shares, public shares/tradable shares and internal employee shares.

State shares are held by central and local governments, which are represented by local financial bureaus, state asset management companies, or investment companies. State shares can also be held by the parent of the listed company, typically an SOE. State shares cannot be traded on the two stock exchanges but are transferable upon state approval (Tenev et al, 2002; Wong et al., 2003).

Legal person shares are shares owned by domestic institutions or firms, which may or may not be owned by the state. In contrast to state agencies, legal persons are legal commercial entities. They operate with independent accounting systems that are formally separated from state bureaucracy and government departments. Legal person shareholders differ from private institutional investors in market economies. Legal person shareholders are a heterogeneous group of investors comprising mainly corporatized SOEs, partially privatized shareholding firms, state-owned non-bank financial institutions, and a few private firms. It is often suggested that most legal person shareholders are state-owned rather than private entities (Tenev et al, 2002; Wong et al., 2003). Similar to state shares, legal person shares are not tradable on the two Chinese stock exchanges. By the end of 1999, 65% of the shares in Chinese stock market were non-tradable.

In addition to state, legal person and tradable/public shares, there are the so-called employee shares. The company sells employee shares to management and employees, typically at a significant discount, at the time of going public. These shares have to be held for 6 to 12 months after an IPO, and can then be sold on the stock exchanges following approval by the securities regulatory authorities. However, in 1998 the regulatory authorities issued a circular in relation to discontinuing the issuance of employee shares. As a result, the number of employee shares is gradually falling (Tenev et al, 2002).

2.4 Current Corporate Governance Practices in China

Market-oriented reforms, including corporatization and ownership diversification, have brought corporate governance issues to the forefront. At the Fourth Plenum of Chinese Communist Party's 15th Central Committee Congress held in September 1999, corporate governance was identified as 'the core' of the 'modern enterprise system'. This indicates that corporate governance has moved to the central stage of the enterprise reform in China. The emphasis on corporate governance reflects the significant progress in building market institutions, but also the limited success of past reform efforts in changing corporate behavior (Tenev et al, 2002).

Qian and Wu (2000) argue that reforms in large-sized SOEs made no breakthroughs on governance issues. Many corporatized SOEs, including those already listed on the two Chinese stock exchanges, suffered from the conflicts between the so-called 'three

old committees' (the Communist Party committee, the employee representative committee, and the workers' union) and 'three new committees' (meetings of shareholders, meetings of boards of directors, and meetings of supervisory committees). In some cases, the conflicts between the Party Secretary and the top manager (such as the CEO or Chairman) are so severe that it interferes in the enterprise's normal operation. To avoid such conflicts, some enterprises opted to place the same person in both positions, working as the Party Secretary and Board Chairman at the same time. But this leads to another problem: 'insider's control'. As a solution to address this 'insiders' control' problem, hundreds of external 'special inspectors' (jicha tepaiyuan) have been sent by the central government to large SOEs to supervise the operations since 1998. However, these inspectors were mostly retired high level bureaucrats who had no knowledge about business operations or financial accounting. Not surprisingly, they did not play any constructive role in addressing the corporate governance problem and this system was then abolished. The Chinese government soon came up with another solution by setting up the 'Large Enterprise Working Committee' (LEWC) (daqiyue gongwei) inside the Party's Central Committee. The LEWC was directly responsible for making appointments of top managers in large SOEs (in collaboration with the Ministry of Personnel). In 2003, a new organization was set up - the State-owned Assets Supervision and Administration Commission of the State Council (SASAC). On the principle of separating government administration from enterprise management and separating ownership from management power, the SASAC performs the responsibility as the investor on

behalf of the state; supervises and manages the state-owned assets of enterprises according to law; guides and pushes forward the reform and restructuring of SOEs. The SASAC appoints and dismisses top executives of the enterprises under the supervision of the Central Government, evaluates their performances and grants them rewards or inflicts punishments. The SASAC also directs and supervises the management work of local state-owned assets¹.

In her speech at the China Business Summit in 2001, Laura Cha, Vice Chairwoman of the China Securities Regulatory Commission, called for the raising of standards of corporate governance to improve the quality of Chinese listed companies. For historical reasons, the majority of Chinese listed companies were restructured and transformed from previously state-owned enterprises or other government controlled entities. Although some of these companies have successfully embraced the discipline of the capital markets, in many cases the transformation was more about in form than about substance. The state is still the largest and the controlling shareholder in many listed companies (Cha, 2001). Laura Cha also pointed out the insufficient understanding of the responsibilities of the board and management to their shareholders, and the lack of internal control and accountability by management in Chinese listed companies. In addition, experience has shown that this system of supervision boards is not effective as it is often unclear whose interest is being represented by the supervisory board. In many cases, the supervisory board duplicates

¹ From the SASAC website: <http://www.sasac.gov.cn/eng/zrzc.html>

the authority of the board itself but without the corresponding responsibilities. In fact, the presence of a supervisory board may give the illusion of certain checks and balance in the listed company when none exists.

The former Chairman of the China Securities Regulatory Commission (CSRC), Liu Hongru, said at the Corporate Governance of Chinese Listed Companies Conference that Chinese companies had made progress in corporate governance reform. Since 2001, the CSRC has improved corporate governance practice in listed companies in many aspects: improving corporate governance regulations, introducing independent directors, improving information disclosure and so forth. The 'Corporate Governance Report of Chinese Listed Companies 2003' from the Shanghai Stock Exchange research centre also shows improvements in the legal environment, independence of the board, transparency and information disclosure. The new forms of incentive plans have been adopted by many listed companies.

However, there are many criticisms of Chinese corporate governance and they attribute the main problems to these factors: the dominant role of government in the economy; restrictions on share ownership; ineffectual monitoring of CEO by non-government shareholders; concentrated ownership; poor quality and non-independence of the board of directors; a thin managerial labour market; lack of relevant laws to enforce property rights; lack of legal redress; inadequate and opaque disclosure practices and poor accounting and auditing standards (Fung et al.2003).

2.5 Executive Compensation and Incentive Schemes in China

Zhang (2003) argues that the history of the reform of SOEs is a history of compensation system reform for entrepreneurs. Before the economic reform in 1978, there was a highly structured pay scale system for SOEs. SOEs have the same standard and uniform reward mechanisms as used in the governments. There was no incentive scheme to motivate managers, nor were managers allowed to share the profit generated by the enterprises. Managers were government agents and representatives and their appointments were completely controlled by the administrative and communist party bureaucrats (Rui et al., 2003). Since 1978, there have been great changes in the compensation system. Generally speaking, it can be divided into three stages. The first stage is from 1978 to 1984, which witnessed the introduction of bonus and piece wage systems, the floating wage system, and pay scales that can be adjusted according to firm performance. However, the reform did not differentiate the pay between entrepreneurs and normal employees. The second stage is from 1984 to 1992 in which the entrepreneurs' compensation could be as high as three times the compensation of normal employees and connecting the entrepreneurs' compensation to firm performance. The third stage is from 1992 to the present. In 1992, some SOEs started experimenting with the annual salary system. In 1997, a few listed companies started using incentive plans and options. The Fourth Plenum of the Chinese Communist Party's 15th central Committee held in September 1999 approved these experiments and proposed to set up the incentive and

constraint mechanism for SOEs' entrepreneurs (Warner and Zhu, 2000; Zhang, 2003).

Managerial compensation in China has the following features: (1) absence of incentive schemes in State-Owned Enterprises (SOEs); (2) 'under-compensation' and 'zero compensation' of top managerial staff; (3) lack of moderation of the wage differences between executives and workers and hence the 'cap' imposed on compensation; (4) the limitations of the forms and structure of top executive compensation (i.e. fixed salaries are always a large percentage of the total executive compensation); and (5) the presence of other objectives other than cash compensation (enhancing political status etc.), as an integral part of the reward package for many managers (Rui et al., 2003; Zhang, 2003).

2.5.1 Executive compensation in China

In many Western countries, there is a growing concern about 'excessive' executive compensation. In sharp contrast, there is considerable concern about the 'under-compensation' and 'zero compensation' of top executive directors in China (Wei, 2000; Rui et al., 2003; Zhang, 2003). Schipani and Liu (2002) argue that one of the most serious problems of corporate governance in China is that many directors and executives are underpaid and this can be examined both internally and externally.

First, internally, fixed salaries are a large proportion of the total executive

compensation. Only a few companies adopted the annual salary system, incentive or option plan. In most SOEs, the socialistic approach (great emphasis on minimizing the pay gap between top managers and workers) is still very much in evidence and there is a policy of capping managers' compensation packages at a certain multiple of the normal worker's wage (Rui et al., 2003), typically between 3 to 15 times.

In the past, because of the close relationship between government and the SOEs, there was a free flow between senior managers in the SOEs and senior officials in government. In many cases, the compensation of senior managers in the SOEs was explicitly or implicitly benchmarked against civil servant wages. As a result, there was a very low level of pay differentials between managers in the SOEs. Now the SOEs are allowed to have a more flexible compensation system but the wage difference between executives and workers remains relatively small, especially in the SOEs. According to the Chinese Human Resources Development Report (2004), many Chinese CEO's compensation is no more than that of a normal employee.

Secondly, externally, the top executive compensation in the SOEs is much lower than their counterparts in fully foreign-owned companies or Sino-foreign joint ventures. On average, the salary of a manager in an SOE is only one-fifth of his or her counterpart in a fully foreign-owned company or a Sino-foreign joint venture (Zheng, 1998). In the Confederation of Enterprises Survey, 83% of the respondent managers said that the biggest obstacle to the growth of first-rate directors and executives in China is the lack of an effective incentive and disciplinary mechanism; 77% of the

managers preferred more generous annual salaries as their major form of compensation.

A 'zero pay' phenomenon was also identified. For example, Wei (2000) finds that only 50% of the top managers in the Chinese listed companies got paid in 1999. There are three possible reasons for this 'zero pay' problem: (1) the zero-paid manager is appointed by the government and still gets paid by the government; (2) the manager is paid by the parent company or group company or connect company; and (3) he/she is an independent director. This indicates the lack of independence of the board and that the internal control system needs improvement.

This 'under-paid' or 'zero pay' problem has led to a fast outflow of talented managers from SOEs to foreign companies, Sino-foreign joint ventures or private companies. In order to motivate and retain managers, more recently, some SOEs have started the process of reforming top executive compensation. In some cities, a few SOEs' top executives' compensation is close to that of private companies. However, in general, the pay gap between executives in SOEs and foreign companies and joint ventures remains large.

Compared with many western countries, Chinese firms do not have appointment and remuneration committees and do not have outside compensation consultant firms for independent advice. Chinese firms have supervisory boards and they ostensibly

oversee the workings and decision-making of the board. However, the supervisory boards are considered to be weak and ineffective, and they appear to exert little influence over the compensation of the CEO (Firth et al., 2006). Managerial compensation is decided by the board of directors themselves. Du et al. (2004) argue that the board decision on CEO compensation relies on the ownership of the corporation as there are no remuneration committees in Chinese listed companies. Fung et al.(2003) argue that government and large (concentrated) shareholders are able to exercise significant control as they deter 'excessive pay'. The presence of foreign shareholders is associated with higher CEO pay because they want to hire talented professional managers and will pay them at market rate. It has been found that substantial government ownership and concentrated ownership appear to reduce pay levels (Du et al., 2004; Rui et al., 2003).

2.5.2 Incentive schemes in Chinese companies

In China, only a few companies adopt the annual salary system, incentive or option plan. Employee shares used to be a major incentive scheme for senior managers as senior management held most employee shares at the time of the IPO. However, senior management is not allowed to sell its shares during its tenure. Therefore, some argue that an employee shares program is more like a benefit than an incentive. Moreover, with the authorities discouraging the issuance of employee shares, this practice is becoming less common. Other stock-based incentives such as stock options

are not being developed because of a lack of legislative support (Tenev et al., 2002). Bonuses then become the only incentive component in many compensation contracts.

Many researchers argue that there are problems caused by the absence of incentive schemes in SOEs, especially in improving firm performance (Wei, 2000; Rui et al., 2003; Zhang, 2003). For example, as Zhang (2003) notes, in 1998 the compensation for the top executive director of 'Wu Liang Ye', a famous wine company with EPS 1.71 (RMB), was only half of that of the top executive director of 'Liang Hua Shiye', whose EPS was minus 0.364 (RMB). This is a typical case of not-paying-for-performance. In fact, due to the strong government influence on SOEs, appointment, compensation and dismissal of executives are all influenced by central or local government rather than being associated with their performance.

Tenev et al (2002) argue that given the lack of strong incentives linked to share performance, corporate managers are particularly sensitive to their performance assessments by their superiors in the political and administrative hierarchy. In many cases, the government still evaluates companies based on their total profits and taxes paid. Thus managers' incentives are not linked to their companies' return on equity or earnings per share growth. As a result, Chinese companies want to issue new shares as often as possible to increase investment, and correspondingly, total profits and taxes. Listed companies also tend to overstate their earnings as they aim to fulfill political expectations, for example, the profit and tax targets set by local governments.

On the other hand, although Chinese executives do not enjoy generous cash incentives like their western counterparts, they do have other forms of benefits such as high social status, better housing, a company car and better medical treatment, which are unaffordable for most Chinese. Moreover, there is a close link between SOEs and government, therefore being promoted to a senior position in government which is associated with enhanced political status is also an integral part of the reward packages for many managers in SOEs (Rui, et al., 2003; Zhang, 2003).

2.5.3 Managerial ownership in China

The Chinese government has tried to use managerial ownership to motivate SOEs' managers. For example, in 1999, it was proposed that senior management in SOEs should hold some share incentives to motivate and constrain their management and investment behaviour, improve firm management efficiency and maximize the value of state-owned assets (Lin et al., 2002). Following this proposal, some regional governments such as Shenzhen and Shanghai have tried to introduce managerial ownership incentives since the late 1990s. In a managerial ownership programme, the director's ownership is allowed a bigger shares package – normally 5 to 10 times of the average employee ownership (Gao and Yang, 2002).

Managerial ownership in China has two main features: first, executive ownership is small compared to Western countries; second, 'zero ownership' is still very common

among executive directors (Wei, 2000; Lin et al., 2002; Zhang, 2003). According to a study by Shanghai Rongzheng (2003), more than 60% of the top management in their study had 'zero ownership' in 2002.

When the company has a managerial ownership scheme, senior management and normal employees are both allowed to buy shares at a discounted price at the time of going public. For normal employees, these shares are not tradable in the first 6 or 12 months after an IPO and cannot be sold on the stock exchange without the approval of the securities regulatory authorities (Tenve et al., 2002). For senior management in listed companies, they cannot sell these shares during their tenure. Therefore, in this way, managerial ownership in China is more like a benefit to senior management rather than an incentive. Senior managers are guaranteed big profits from their shareholdings since the price differences between the primary and secondary stock market in China are huge. Managerial ownership is a reward for the management position, and also with a lump sum reward for past performance rather than an incentive for long term performance (Wei, 2000). Furthermore, in 1998 the regulatory authorities issued a circular to discontinue the issuance of employee shares. As a result, the number of employee shares is gradually falling (Tenev et al., 2002).

2.6 Boards of Directors in China

According to the Chinese Company Law, the general meeting of shareholders,

rather than the board of directors, is intended to be the power center in Chinese listed companies (Schipani and Liu, 2002). The board of directors in China only has the power to formulate business and investment plans. The power to approve the plans is vested in the shareholders' meeting. Members of an executive board are appointed by the shareholders' meeting, and the executive board is also required to submit the reports to the shareholders' meeting for review and approval (Chen, 2005). According to the survey, shareholders appoint 76% of the directors of listed companies. Holders of state-owned legal person shares are the most influential, selecting 48% of all directors, followed by owners of state shares at 21%. Thus directly or indirectly, the state is in absolute control, selecting almost 70% of all directors (Tenev et al, 2002).

There are no mandatory requirements on appointing committees to assist the board in making informed and conscientious decisions. Most Chinese corporations, except for overseas-listed corporations, have appointing committees (Schipani and Liu, 2002).

2.6.1 Independent directors, board composition and board size

In August 2001, the China Securities Regulatory Commission (CSRC) formulated the 'Guidelines for Introducing Independent Directors to the Board of Directors of Listed Companies'. The Guidelines emphasize the 'independence' requirements for independent directors which includes independence from large shareholders, management and operations.

In China, a typical corporate board of directors consists of three types of independent directors: (1) the directors who represent the state. In order to control the huge amount of state assets dispersed in thousands of SOEs, the government established the 'State Assets Management Bureau' at both central and local levels. These bureaucratic agencies then appoint directors to the corporate boards. The directors representing the state are mostly previous government officials. (2) Independent directors represent legal person (institutional) shareholders such as financial institutions and business companies other than the shareholding company's parent firm or subsidiaries. (3) Academic researchers or independent professionals who are invited to sit on the board. None of these directors are directly involved in day-to-day management of the shareholding company. Shao et al (2004) argue that most independent directors are academic researchers. Many companies hire famous scholars as independent directors for they can bring a good reputation to the companies, rather than those specialized professionals, who may improve the operation of the companies.

Many researchers argue that in the Chinese two-tier board governance system, there are possible conflicts between the independent directors and supervisory board. The real 'independence' of the independent directors has been questioned as well. Tian and Lau (2001) argue that directors who represent the state and legal person (institutional) shareholders violate the 'independence' requirement. These factors can greatly affect the effect of an independent director (Shao et al, 2004).

2.6.2 Supervisory board

Chinese listed companies should adopt a two-tier board structure according to the Company Law, which consists of a board of directors and a supervisory board. Pursuant to the Company Law, supervisors shall perform the following duties: (1) examine corporate financial affairs; (2) supervise directors' and executives' breaches of statutes or Memorandum of Associations in performing their duties; (3) demand that directors and executives redress misconduct damaging corporate interest; (4) propose special meetings of the shareholders; and (5) other duties as stipulated in the Memorandum of Associations. Supervisors also have the power to audit the board of directors' meeting. The board of supervisors includes shareholder representatives and certain employee representatives, with the percentage of representation of each group to be stipulated in the Memorandum of Associations (Schipani and Liu, 2002). The members of the supervisory board are appointed by the shareholders' meeting.

Tenev et al (2002) argue that the board of supervisors in China is unique: a mixture of the German-style supervisory committee and China's traditional concept of employees as masters of enterprises. The majority of supervisors hold political science degrees, with few holding degrees in economics management or engineering. The proportion of supervisors coming from government authorities that supervised the parent companies is higher than in the case of directors. Overall, supervisors have less business and less outside- company experience than directors.

Xiao et al. (2004) argue that the supervisory boards play a small role. In the majority of companies they interviewed, supervisors are regarded as either honoured guests, friendly advisors or censored watchdogs instead of having an independent monitoring role. Tenev et al (2002) propose that supervisors generally meet less often than boards of directors and their meetings are less well attended. Supervisory boards are more ‘decorative’ than functional. Their published announcements indicate that they rarely contest decisions made by boards of directors and company executives. The lower-quality and less professional experience of supervisors compared with directors and managers have led to supervisors’ inability to actually supervise directors and managers.

2.7 Conclusion

China is the world’s largest transition economy, which is being transformed from a formerly central-planned economy towards a market-oriented economy. One of the most critical aspects of the transition is the corporate governance reform (Wright et al. 2005). Corporate governance reflects both the institutional environment external to firms, such as the legal system and regulations, as well as the institutional environment internal to firms, such as boards of directors, incentive systems and transparency (Roth and Kostova 2003). This chapter has described the corporate governance in China from both external and internal institutional environment perspectives. In particular, this chapter has discussed the legal framework related to

corporate governance; the ownership structure of the Chinese listed companies and the current corporate governance practices of Chinese listed companies. Furthermore, it has discussed executive compensation, managerial ownership and board characteristics in China.

This chapter shows that China has gone on a long journey towards economic reform and the reform of SOEs in particular. However, it was argued that political constraints on labour decisions mediate the effects of economic liberalization forces on aspects of organizational design such as delegation, performance management and incentives in Chinese state-owned enterprises. The political constraints are defined as the degree to which governmental authorities and Communist Party representatives intervene, regulate, or control an SOE's labour decisions including hiring, firing, and promotion (O'Connor et al., 2006). Understanding the interaction between the effective control by managers over some decisions and the ultimate control by the Party and the government over other decisions is the key to understanding the issues of the reform of SOEs (Qian, 1996). O'Connor et al. (2006) argue that the question of how to break up the old vested interests in state-owned industry has been described as a 'forbidden area' of reform because it affects the government's ability to regulate, monitor, or control employment and other resource allocation. Hassard et al. (1999) argue that there is limited research on how to resolve the contradicted interests between managers, shareholders and the government because of the issue's great political sensitivity.

The literature, both theoretical and empirical, on the political influences on executive compensation practices in China is very limited if not non-existent. In the following chapters, three theoretical models of executive compensation (the managerial power model, tournament model and simultaneous model) are reviewed before discussing their application in China. In particular, the political influences on executive compensation practices in China are explored.

Chapter 3 Literature Review - Models of Executive Compensation (Parts I & II)

3.1 Introduction

Gomez-Mejia (1994) argues that executive pay, as a mechanism of corporate governance in modern enterprises, is very important because of its effect on the firm's strategic choices, its fairness implications and its cascading impact on the compensation structure of the entire organization. Executive compensation and its relationship to corporate performance has become an important issue in managerial, economic, accounting and financial circles (Pavlik et al., 1993). Both theoretical and empirical literature on executive pay is rather extensive, especially in western countries. Theories are deduced from different perspectives and tested by the data in different industries, times and countries. The most researched topic in this literature is the relationship between CEO compensation and firm performance conducted using agency theory (Barkema and Gomez-Mejia, 1998). However, after literally hundreds of studies the empirical evidence on this issue is still mixed (Finkelstein and Boyd, 1998). Jensen and Murphy (1990) suggest that it is important to integrate agency theory with other models, or to empirically test the explanatory value of alternative theories to agency-based models.

In this thesis, three under-researched models are selected to explain the determinants and structure of executive compensation in China: the managerial power model, tournament model and simultaneous model. The literature on the managerial power model and the tournament model is reviewed in this chapter. The simultaneous model is reviewed in the next chapter. Taking into consideration the distinct characteristics of the Chinese economy, a feature of which is dominant state ownership and the resulting ultimate control of the Chinese Communist Party (CCP) and the government over labour decisions in SOEs (including hiring, firing and promotions), the strong political influences over the board of directors are considered. All three models are evaluated and adapted to the Chinese context.

Part I: Managerial power theory

3.2 Introduction

Most empirical studies on the association between executive compensation and firm performance have used agency theory. Agency theory suggests that power imbalance favours the executives, allowing them to pursue their self-interests in the form of large pay packages. Grabke-Rundell and Gomez-Mejia (2002) argue that because of its roots in economic discipline, agency theory has led researchers to test financial rather than behavioral hypotheses. Over 70 years of research has been

conducted on the pay-performance relationship, but only a few significant relationships have been found.

By incorporating behavioral conjectures of power into the agency theory framework, Grabke-Rundell and Gomez-Mejia (2002) provide a comprehensive approach to testing the determinant of executive compensation. They combine agency theory with the resource dependency theory and with specific measures of power developed by Finkelstein (1992) for a more complete executive pay model. Finkelstein (1992) argues that top managers' power plays a major role in strategic choice. However, although research in strategic management has generally acknowledged this proposition, empirical work has tended to lag behind because of difficulties in conceptualizing and measuring power in top management teams. Finkelstein (1992) presents a set of dimensions measuring top managers' power and suggests a measurement methodology to facilitate empirical inquiry which is then tested and supported by the study of Lambert et al. (1993). In the present study, considering the unique Chinese context, a fifth power dimension – political power of executive directors – is added into the Finkelstein (1992) model to explore its application in China.

In the following sections, the theoretical framework of managerial power theory is discussed, followed by its relationship with executive pay and a discussion of its applications in the Chinese context. A brief conclusion is also presented.

3.3 Managerial Power Framework

Finkelstein (1992) argues that top managers' power plays a key role in strategic decision-making and managerial power is central to research on top management teams. In an organization in which the CEO wields dominant power, studying only the CEO may provide sufficient information with which to test propositions. However, in organizations in which power is less polarized, consideration of a coalition of top managers is necessary to fully capture the range of managerial orientations prevailing. Hence, consideration of the distribution of power among top managers seems an essential ingredient for research on top management teams. In addition, empirical findings support the notion that CEOs share power with other senior executives in many firms (Finkelstein, 1988; Bantel and Jackson, 1989).

Power is defined by Finkelstein (1992) as the capacity of individual actors to exert their will. Finkelstein (1992) summarizes that power relations in dominant coalitions arise because of the interdependent nature of managerial work. Power accrues to top managers who (1) can cope with uncertainty and (2) are uniquely positioned to do so. Emerson (1962) argues that power is a relative concept that can only be understood in a particular context. In Finkelstein's (1992) research, the context is dominant coalitions, and the important sources of uncertainty are those elements of organizations and their environments that most directly affect managerial work. Given the centrality of managing uncertainty, the key basis of power for top managers is the

ability to cope with internal and external sources of uncertainty. According to Freeman's (1984) stakeholder approach, key internal sources of uncertainty are other top managers and boards of directors, and major external sources of uncertainty are a firm's task and institutional environments. The corresponding types of power that accrue to executives who can manage these uncertainties are structural power, ownership power, expert power and prestige power. In developing the managerial power model, Finkelstein (1992) collects data from a group of 1763 top managers in 102 firms over a period of 5 years (1978-1982) from the computing, chemical and natural gas industries. In the preliminary analysis, the data was factor analyzed, yielding the four power dimensions. The four dimensions tested well for internal consistency and discriminant validity. In a follow-up study, the four dimensions were tested for convergent validity with perceptual measures of power. The perception of power assessed by the survey instrument positively correlated with three dimensions of power: structural, ownership, and prestige. Thus, results demonstrate strong support for three of the four power dimensions.

The power dimensions applied in Finkelstein (1992)'s research are defined as follows (Figure 1):

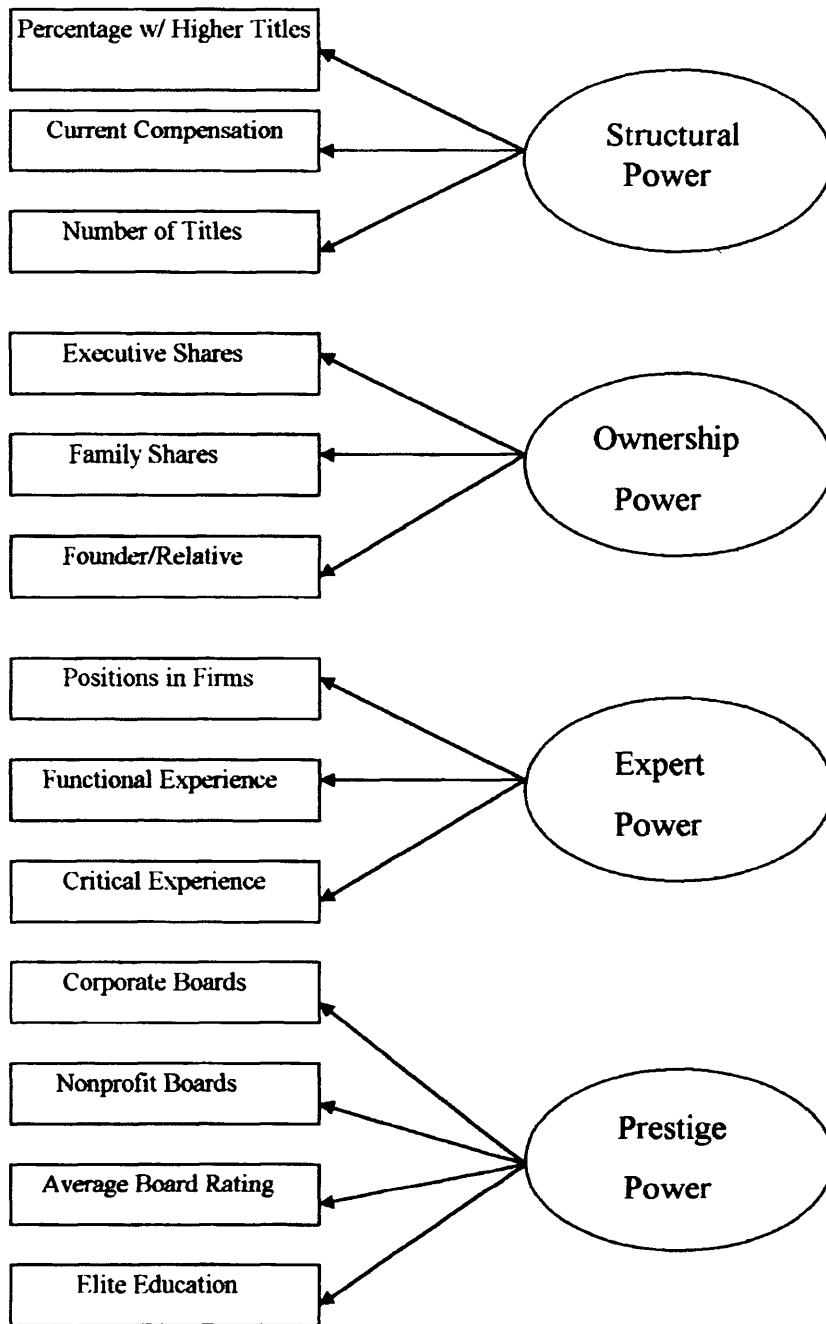


Figure.1. Finkelstein's (1992) model of executive power (Grabke-Rundell and Gomez-Mejia, 2002).

Structural power

Structural power is related to the distribution of formal positions within an organization. Managers who have a legislative right to exert influence are influential. Hence, CEOs have high structural power over other members of dominant coalitions because of their formal organizational position. The greater a manager's structural power, the greater his or her control over colleagues' actions. Finkelstein (1992) uses three variables to create a structural power scale:

1. The percentage with higher titles. This variable is the percentage of individuals in a firm's dominant coalition with higher official titles than a focal executive.
2. Compensation. The variable is defined as the total cash compensation of an executive divided by the compensation of the highest paid manager in the same firm.
3. The number of titles. This variable is defined as the number of official titles a manager has, as stated in annual reports.

Ownership power

Finkelstein (1992) argues that the agency relationship that is central to ownership

power suggests that shareholdings are relevant indicators of power. In addition, a manager's familial links with other officers and the board enhance ownership power by bypassing traditional sources of board control. Hence, indicators of ownership power are:

1. Executive shares. This variable is defined as the percentage of a firm's shares owned by an executive and his or her spouse and dependent children.
2. Family shares. This variable is defined as the percentage of a firm's shares owned by an executive's extended family (brothers, father, and so forth).
3. Founder or relative. Ownership power may also derive from a manager's personal relation to other powerful managers. The third indicator is based on (a) the manager being the founder of the firm, or is related to the founder, and (b) the manager having the same last name as another officer.

Expert power

Expert power accrues to the executive who has made numerous contacts with the firm's external constituents. In the context of strategic decision-making, expertise may be defined as the ability to deal with environmental dependencies. One way of assessing such coping capability is to examine functional expertise. Top managers

with functional experience in a particular area can be said to be an expert in that area (Finkelstein, 1992). Finkelstein (1992) use three variables to measure expert power:

1. Critical expertise power. Finkelstein (1992) assess critical expertise power by matching functional experience with environmental requirements, as follows: input—purchasing, personnel, exploration; output—sales and marketing, product R&D; throughput—operations, accounting, process R&D; and regulatory concerns—government service, law. The actual measure was calculated by adding up the proportions of citations in each environmental requirement area in which a focal manager had corresponding functional experience.
2. Functional areas. This variable is a straight count of the number of different functional areas a focal manager had experience in. It recognizes that managers with a broader background may be better able to cope with multiple stakeholders from a firm's task environment.
3. Positions in firm. Finkelstein (1992) argues that the greater the number of different positions a manager has had in a firm, the wider his or her range of interaction with environmental actors.

Prestige power

Finkelstein (1992) argues that prestige power is related to a manager's ability to absorb uncertainty from the institutional environment. The four variables below emphasize the role of outside directorships and education as key components of prestige.

1. Corporate boards. This variable is the total number of corporate boards of directors a manager sits on. Previous research on directorships has suggested that managers may use board memberships to manage inter-organizational dependencies (Pfeffer, 1972) or to establish and maintain contact with other important people in the business elite (Allen, 1974; Useem, 1979). The greater the number of directorships, the greater the prestige score for an executive.
2. Nonprofit boards. This variable is the total number of nonprofit boards a manager sits on. In addition to providing social contact for members, nonprofit boards often bring together many influential people in a forum that facilitates information exchange.
3. Average board rating. This variable measures the financial standing of the firms for which a manager is a board member by using the Standard & Poor's rating of their general financial condition.

4. Elite education. Prestige power may also derive from a manager's educational background (D'Aveni, 1990). Useem (1979) suggests that because candidates for institutional governance often come from this elite group, top managers with elite educational backgrounds may be more influential within a dominant coalition.

Finkelstein's (1992) work is a first attempt in conceptualizing and measuring power in top management teams. He suggests that more work may be needed to refine each of the measures and the four dimensions of top managers' power appear to offer researchers both a framework and a measurement methodology that may greatly facilitate empirical work in the area. Finkelstein (1992) also points out several limitations to the approach of measuring power dimensions. First, although the power dimensions are expected to be important in most instances, situational differences may shift the balance of power. Second, no attempt was made in his model to identify the factors that affect the relative importance of types of power.

Based on Finkelstein's (1992) model, Grabke-Rundell and Gomez-Mejia (2002) present a more complete executive pay model and illustrate how power can be used as a determinant of executive compensation, which is discussed in the next section.

3.4 Power as a Determinant of Executive Compensation

Regardless of how firm performance is measured or the pay components considered, empirical investigations reveal that the amount of variance in executive compensation explained by firm performance seldom exceeds 50%, suggesting that there are other important unidentified determinants of executive pay levels (Grabke-Rundell and Gomez-Mejia, 2002). According to managerialists, the missing link between executive pay and firm performance is a power imbalance between executives and shareholders (Tosi et al., 1999).

According to agency theorists, dispersed shareholders lose their ability to coordinate their monitoring of executive actions because of the information asymmetry problem. Agency theorists argue that the problem of shareholder dispersion and information asymmetry can be minimized with effective board monitoring, termination threats, and incentives that align executive and shareholder interests (Barkema and Gomez-Mejia, 1998). Grabke-Rundell and Gomez-Mejia (2002) argue that agency theory implicitly acknowledges the existence of power in the relationship between executives and shareholders. Tosi et al. (1999) propose that the agency contract itself is a concept that pertains to a power relationship between the executive and shareholders. Agency theorists posit that shareholders are able to exert their influence over agents with the agency contract. The agency contract is enforced through board of the directors who have the authority to structure compensatory

rewards, and in extreme cases, fire the executive. The board monitoring mechanism, compensation and termination threats are implicitly treated as sources of shareholder power by agency theorists (Grabke-Rundell and Gomez-Mejia, 2002).

Tosi et al. (1998) conducted a meta-analysis which clarifies the strength of the agency contract: firm performance predicted less than 5% of the variation in executive compensation levels, while firm size accounted for almost half of the variance. These empirical studies reveal that the executive has power relative to shareholders that allows the executive to enhance his or her compensation package despite firm performance criteria (Grabke-Rundell and Gomez-Mejia, 2002). Although power is often implied as a major determinant of executive compensation, it has seldom been operationalized or tested in empirical research for its effects on the levels and components of executive pay packages. Grabke-Rundell and Gomez-Mejia (2002) argue that the reason that power has not received explicit consideration is due to the limited assumptions about human behaviour that are given in economic models. Agency theory is constrained to a single view of human nature, self-interests, and limited to the firm as the unit of analysis. It gives little consideration to the processes in which individual agents obtain their preferences and make strategic decisions for their firms. From an agency theory perspective, power is achieved when shareholder and board monitoring systems are ineffective. Power from this perspective can be defined simply as a cost to shareholders due to self-interested pursuits or as one's ability to overcome the monitoring constraints to increase self-serving behaviour.

However, according to management, psychology, and sociology disciplines, power contains positive qualities as well, including the ability to secure critical resources for the firm, network with the business elite, and establish legislation favorable to all firms. Due to the importance of power in agency theory, an expanded definition of power in agency theory might serve to significantly explain compensation levels when executive power is operationalized and directly tested.

Grabke-Rundell and Gomez-Mejia (2002) integrate perspectives of power with agency theory to develop a more comprehensive and calculable model of executive compensation. According to Finkelstein's (1992) model, there are four power dimensions: structural power, ownership power, expert power and prestige power. Structural position and executive ownership are factors that enable an executive to effectively deal with uncertainties from the firm's internal environment, including its employees, shareholders and board members. The expertise and prestige power are posited to reduce uncertainty from the organization's external environment: customers, suppliers, competitors and government (Conyon and Peck 1998).

Structural position is based on the argument that one's authority increases as one moves up the hierarchical ladder. Grabke-Rundell and Gomez-Mejia (2002) propose that structural power over the internal directors should allow executives to pursue self-interests, including a large compensation package. Hence they propose:

Proposition 1: CEO structural power has a positive effect on the executive's compensation level.

Stock ownership is also a very important source of power within corporations. Grabke-Rundell and Gomez-Mejia (2002) argue that as legal owners of the firm, shareholders are given the right to vote and influence strategic decisions, power that increases along with the percentage of shares owned. Moreover, executive shareholders are in a position to influence board decisions, his or her performance criteria and to increase their tenure with the firm. Sanders and Carpenter (1998) point out the executive ownership also reduces uncertainty for the firm's owners by guaranteeing that the executive's interests are aligned with theirs. Thus Grabke-Rundell and Gomez-Mejia (2002) propose:

Proposition 2: CEO stock ownership has a positive effect on the magnitude of the overall executive compensation package.

According to Finkelstein (1992), expert power accrues to the executive who has made numerous relationships with the firm's external constituents. The more relationships the executive has established during his or her employment, the greater the executive's power to secure resources and reduce external uncertainties. Grabke-Rundell and Gomez-Mejia (2002) propose that when the executive has had plentiful experiences with the firm, board members may become dependent on the

executive for knowledge regarding the best use of the organization's resources. The executive can take advantage of the board members' dependency to justify a higher pay package. They propose:

Proposition 3: CEO expert power has a positive effect on the executive's total compensation level.

Moreover, Grabke-Rundell and Gomez-Mejia (2002) argue that prestige acts as a symbol of power and provides a means by which resource information can be obtained. From the resource dependency point of view, prestige is a source of power for the executive because board members are likely to be submissive to an executive who has privileged access to resources and higher social class. Useem (1979) argues that an executive can obtain a high social status and access to resources by the network of interlocking directorates, especially among firms that have been successful. Multiple directorships place the executive in the centre of business social circles and grant the executive greater information concerning resources. Furthermore, a large number of prominent social contacts increases the executive's prestige within the business community, which makes the executive an attractive candidate for other board members. Thus, the executive's multi-directorship is a significant source of power for the executive. From a network centrality perspective, power increases with an individual's proximity to the centre of network exchanges. A central location is ideal for resource access. The more boards an executive sits on, the more central the

executive's position in the business community, and the greater the executive's awareness of relevant resource transactions (Baum and Oliver, 1991; Grabke-Rundell, Gomez-Mejia, 2002). From the agency perspective, Harrison and Kaplan (1991) argue that an executive serving on the board of a firm in which one of his or her board members is employed may enhance the self-serving interests of both directors. Therefore, Grabke-Rundell and Gomez-Mejia (2002) propose:

Proposition 4: CEO prestige power has a positive effect on the executive's total compensation level.

3.5 Managerial Power - Compensation Model in the Chinese Context

3.5.1 Political power in Chinese listed companies

One of the key components of economic modernization in China is the corporatization of State Owned Enterprises (SOEs). In the 1990s, many SOEs were partially privatized by issuing a minority allocation of shares to individual investors. Many of the SOEs, especially those with good performance, were then listed on the Shanghai and Shenzhen stock exchange in China. While granting more autonomy to the SOEs' managers, central and regional governments often retain sufficient shares to maintain voting control of the firm. The government retains ultimate decision rights concerning mergers and acquisitions and the disposal of shares and assets of these

listed firms, as well as decision rights on the appointment of CEOs (Fan et al., 2007).

Moreover, the government, more specifically the Chinese Communist Party (CCP), retains ultimate control over the appointment of Chairmen in these listed firms as well. In western countries, the control power and decision rights are shared among the board of directors, particularly between CEO and Chairman under a dual-leadership structure. In a Chinese listed company with dominant state ownership, the control power and decision rights are shared among CEO, Chairman and the Secretary of the CCP's committee in the company. It is rare that CEO, Chairman and Party Secretary are the same person in a Chinese listed company. But in most cases, Chairman and Party Secretary is the same person to avoid conflicts between the Party Secretary and top managers. For example, according to the regulations from the State-owned Assets Supervision and Administration Committee of State Council (SASAC)² Shanghai branch and Shenzhen branch, if the Chairman is a Party member, he or she should also serve as the Party Secretary. If the Chairman also serves as Party Secretary, he or

2 According to the 'State Council Institutional Reform Scheme' approved at the First Session of the 10th National People's Congress of PRC, the State-owned Assets Supervision and Administration Commission of the State Council (SASAC) has been set up. On the principle of separating government administration from enterprise management and separating ownership from management power, SASAC performs the responsibility as the investor on behalf of the state; supervises and manages the state-owned assets of enterprises according to law; guides and pushes forward the reform and restructuring of SOEs. SASAC appoints and removes top executives of the enterprises under the supervision of the Central Government, evaluates their performances, and grants them rewards or inflicts punishments. SASAC also directs and supervises the management work of local state-owned assets. (From SASAC website: <http://www.sasac.gov.cn/eng/zrzc.htm>)

she is in a dominant position in the company for a number of reasons. First, although the CCP/government has greatly lessened the control over the listed SOEs, the Party committee still plays an important role. Since the CEO is usually a Party member as well, theoretically, he or she should follow the orders of the Party committee of the company due to subordinate obedience. In other words, the CEO is under the leadership of the Party Secretary (who in most cases also acts as Chairman). Hence, the Chairman/Party Secretary has structural power over the CEO within the Party. Second, the government retains the right to appoint and remove CEOs, evaluate CEOs' performance and reward or punish CEOs. As the government is led by the Party, eventually the Party has ultimate control over those listed companies with dominant state ownership. For example, according to the 'Regulations of Appointment and Dismissal of Top Management' of SASAC Shenzhen branch, the Chairman and Party Secretary should be consulted about the appointment of CEOs. As a result, the Secretary of the Party committee of the company, who is the official representative of the Party in the company, is in a strong position to influence board decisions.

From the above analysis, an executive director's power is higher when an executive director also serves as the Party Secretary. Therefore, power over other boards of directors would allow the Chairman to pursue self-interests, including a large compensation package. In other words, the Chairman's political power has a positive effect on the level of executive compensation.

3.5.2 Ownership power and structural power in Chinese listed companies

In this study, I have alternative explanations for the relationship between executive ownership and compensation in the managerial power model in China. In Chinese listed companies, CEO shareholdings are usually very small (Wei, 2000; Lin et al., 2002; Zhang, 2003). According to a study by Shanghai Rongzheng (2003), more than 60% of top management in their study has ‘zero ownership’ in 2002. It is unlikely for the executives to exert ownership power to influence board decisions including his or her compensation package design due to the insignificant executive ownership. Instead, besides its function as a supplement to executive compensation (Li, et al. 2007), executive ownership in Chinese listed companies can be considered to be an important indicator of structural power. In support of this view, Tenev and Zhang (2002) show that the Chinese government allocates shares to the CEO based on his or her rank in the managerial hierarchy. CEO shareholding thus provides an indicator of the CEO’s standing in the company and should be considered as an indicator of structural power.

3.6 Conclusion

Part I of this chapter illustrates a model alternative to the most tested agency model on executive compensation: the managerial power model which was developed by Finkelstein (1992). Using primarily resource dependency theory, Finkelstein

identified four power dimensions for top executives: structural power, ownership power, expert power and prestige power. Grabke-Rundell and Gomez-Mejia (2002) utilize the four power dimensions to develop four propositions of how executive power affects executive pay. They propose that the CEO's structural power, ownership power, expert power and prestige power all have great influence on the level of CEO compensation.

In this study, the managerial power-compensation model has been adapted to fit with the Chinese context. As most Chinese listed companies are former State-owned enterprises (SOEs), although the State has given the managers more autonomy on operations and decision making in the company, government stills retain tight control over strategic decision-making, appointment or dismissal of top executives. In addition, the Chairman of a Chinese listed company normally serves as the Party Secretary as well. The duality of Chairman and Party Secretary causes the power imbalance within the company, which favours the Chairman/the Party Secretary over other executive directors. This power imbalance allows the Chairman/the Party Secretary to pursue self-interests, including a large compensation package for himself or herself.

Part II: Tournament Theory

3.7 Introduction

Having discussed the managerial model in the previous section, this section focuses on the tournament theory. The tournament theory was initially developed by Lazear and Rosen (1981), attempting to provide an alternative perspective on executive compensation. Compared with agency theory-based research, the tournament theory remains an under-explored area, partly due to the difficulties in collecting data (Eriksson, 1999). However, interest in the tournament theory has been growing. In this section, firstly, the theoretical framework of tournament theory is reviewed, followed by a review of the empirical findings. The need to adjust the tournament model to fit a Chinese context is also briefly discussed, which will be further explored when proposing research hypotheses in next chapter. Finally, a brief conclusion is drawn.

3.8 Theoretical Framework of Tournament Theory

Lambert et al. (1993) point out that much of the economics-based research on organizational incentives uses formal principal-agent models. Agency research is primarily theoretical and has largely addressed the design of optimal compensation

contracts in highly stylized settings. Such research, while conceptually important, has produced few empirically testable insights into how firms manage their promotion policies or select the organization's compensation structure. O'Reilly et al. (1988) argue that while most of the research on executive compensation has used economic theory, there is some reason to suspect that non-economic factors may also be important in the determination of executive salaries. In the empirical studies on executive compensation, O'Reilly et al. (1988) argue that almost all empirical investigations of CEO compensation have centered on economic determinants: the answer to the question has been sought by attempting to show that salaries and bonuses can be explained by relating them to factors such as firm size, profitability or growth. Top compensation is thought to be justified if it is related to these characteristics. Unfortunately, these relationships are typically neither strong nor consistent across industries or time.

The other stream of research is centered on tournament theory, which was initially developed by Lazear and Rosen (1981). Lazear and Rosen (1981) consider a rank-order payment scheme which had not been analyzed but which seems to be prevalent in many labour contracts. This scheme pays prizes to the winners and losers of labour market contests. The main difference between prizes and other incentive schemes is that in a contest, earnings depend on the rank order of contestants. That is, salaries are not contingent upon the output level of a particular game, because prizes are fixed in advance. If inexpensive and reliable monitors of effort are available, then

the best compensation scheme is a periodic wage based on input. However, when monitoring is difficult, so that workers can alter their input with less than perfect detection, the situation can often be improved if compensation is related to a more easily measured output level. When monitoring costs are so high that moral hazard is a serious problem, the gain in efficiency from using output-based pay may outweigh the risk-sharing losses. It is for these reasons that it is sometimes a superior way to bring about an efficient incentive structure.

In other words, the tournament theory argues that the level of CEO is not designed to compensate the incumbent for his or her contributions to the firm or to make the executive accountable for firm performance. Rather, the purpose of executive pay is to offer a very attractive financial trophy at the top to increase the aspirational level of all managers. So agents will exert effort in order to be promoted to a higher position in the management hierarchy, which is also associated with a higher level of compensation. O'Reilly et al. (1988) argue that the difficulties in monitoring executive effort (the principal-agent problem) and the tendency for employees to be more risk-averse than firms could make such arrangements preferable, under certain conditions, to other forms of determining compensation. Such a scheme provides a theoretical justification for the very large observed differences between CEO salaries and those of executives of the immediately lower level.

To illustrate the tournament model, Eriksson (1999) provides a simplified model of the work of Lazear and Rosen (1981). In this model, there are two identical contestants, denoted j and k . W_1 , W_2 are the fixed prize to the winner and loser of the game respectively. The winner is the contestant who produces the largest output. The contestant's output,

$$q_i = \mu_i + \varepsilon_i, i = j, k, \quad (1)$$

depends on the contestant's effort level, μ , and a random or luck component denoted by ε . Average output, μ_j , is produced at cost $C(\mu)$, with $C', C'' > 0$, which suggests the more the effort, the higher the cost.

According to Erikson (1999), the probability that j wins W_1 positively depends on how much effort he puts forth (μ_j) and negatively on the actions of the other contestant (μ_k). In addition, the probability of winning is also affected by the distribution of ε . A contestant's expected utility is

$$P[W_1 - C(\mu)] + (1 - P)[W_2 - C(\mu)] = PW_1 + (1 - P)W_2 - C(\mu), \quad (2)$$

where P is the probability of winning. The probability that j wins is

$$\begin{aligned} P &= \text{prob}(q_j > q_k) = \text{prob}[(\mu_j - \mu_k) > (\varepsilon_k - \varepsilon_j)] \\ &= \text{prob}[(\mu_j - \mu_k) > \xi] = G(\mu_j - \mu_k) \end{aligned} \quad (3)$$

where $\xi = \varepsilon_k - \varepsilon_j, \xi \sim g(\xi)$, G = the cumulative density function of ξ , and $E(\xi) = 0$. Each of the players chooses μ_j to maximize (2). Assuming interior solutions, this implies

$$(W_1 - W_2) \frac{\partial P}{\partial \mu_i} - C'(\mu_i) = 0$$

$$\text{and} \quad (W_1 - W_2) \frac{\partial^2 P}{\partial \mu_i^2} - C''(\mu_i) < 0, i = j, k. \quad (4)$$

If both players are maximizing (3) taking the other player's action as given, then using (3),

$$\partial P / \partial \mu_j = \partial G(\mu_j - \mu_k) / \partial \mu_j = g(\mu_j - \mu_k),$$

which after substitution into (4) gives player j 's best reaction function,

$$(W_1 - W_2)g(\mu_j - \mu_k) = \partial C / \partial \mu_j.$$

Player k 's reaction function is symmetric. In Nash equilibrium, $\mu_j = \mu_k$, and $P = G(0) = 1/2$, so the outcome is purely random in equilibrium. Then

$$(W_1 - W_2)g(0) - \partial C_i / \partial \mu_i = 0. \quad (5)$$

Which verifies the point that players' output depend on the spread between winning and losing prizes. It can be seen that the average wage necessary to attract employees to the firm and the optimal wage spread are

$$(W_1 + W_2)/2 = C(\mu) \quad (6)$$

and $W_1 - W_2 = 1/g(0), \quad (7)$

respectively.

Eriksson (1999) points out that Equation (5) has two implications. First, the equilibrium level of output is increasing in the spread between the winning and the losing prize. The levels of the prizes do not affect output levels as long as prize differentials are unchanged. In the case where there are several positions within the firm, tournament theory predicts that there will be an increasing ratio of pay as the individuals move up along the corporate ladder. As a consequence, there is a convex relationship between pay and organizational level (Rosen, 1986). At the final level there is no further prize to be won, and therefore CEOs should be given an extra prize. Thus, tournament theory predicts an extraordinarily large pay differential between CEO and the managers at the next level below. The second implication of (5) and also an implication of (7) is that the greater the importance of the random components in output, the lower is the optimum level of effort for a given spread $W_1 - W_2$.

There are two assumptions in the model above. First, the players do not differ with respect to their abilities. If players know their own ability as well as that of the other players, the outcome may be a lower level of effort. Another assumption is that the number of players is restricted to two, and the number of players does matter in tournament models. With more players, the probability of winning is smaller (Eriksson, 1999). McLaughlin (1988) examines how the effect of effort on the probability of winning changes as the number of contestants increases. McLaughlin (1988) show that the prize spread is increasing in tournament size, whereas effort is unaffected. The effect of a marginal increase in effort on the probability of winning decreases as the number of contestants increases. Consequently, to induce effort, the prize spread has to be increased.

A major concern of tournament theory is that the senior management of a firm often acts as a team performing highly interdependent work. Therefore, in some cases, compensation based on individual performance may be inappropriate because it leads to too harsh competition among the members in the management team (Eriksson, 1999). As discussed by Lazear (1989), there may also be incentive motives for firms to adopt a more compressed pay structure. According to Lazear's terminology, in 'hawkish' firms - in which cooperation is less important - wider pay gaps may enhance performance whereas in 'dovish firms' - in which the cooperation of the managers is essential for the success of the firm - rewarding managers according to their individual achievements may not be a good idea (Eriksson, 1999).

3.9 Empirical Findings of Tournament Theory

Empirical tests of the tournament theory on executive compensation are quite limited, compared to the large amount of empirical research on executive compensation and performance. Eriksson (1999) explains that it is simply because data sets containing information about several managers per firm are hard to find. Table 3.1 shows some of the previous empirical research on tournament theory and executive compensation.

Table 3.1 Previous studies of tournament theory and executive pay

Authors	Sample	Period	Industries	Key variables tested
O'Reilly et al. 1988	105	1984	9 Industries	CEO compensation, Mean salary of top VPs, Gap between CEO salaries and Vice Presidents, Number of VPs
Lambert et al. 1993	303	1982-1984	42 SIC codes	Management compensation and corporate hierarchy (Corporate CEO, Group CEO, Divisional CEO and Plant managers)
Main et al. 1993	210	1980-1984		Gap in base salary plus bonus between the CEO and the average VP, Number of VPs; Job level and difference in compensation; Compensation for executives promoted to CEO; proportion of who are profit-center heads (wage compression)
Eriksson 1999	210	1992-1995		Job-level pay differences (low level manager, higher level manager, manager in top level group, manager in board)
Eriksson 1999	111	1992-1995		Gap between CEO pay and average managerial pay, number of contestants ³ ; proportion of who are profit-centre heads (wage compression)
Bognanno 2001	>600	1981-1988		Difference between CEO pay and VP pay; CEO Prize ⁴ , number of executive board members (VPs)
Conyon et al. 2001	100	1997-1998		Job-level difference in compensation (group CEO, divisional CEO, and other executives); gap between compensation of group CEO, divisional CEO, and other executives; number of executive directors; coefficient of variation of executive team compensation (pay dispersion) and performance

1. Following O'Reilly et al. (1998), Eriksson (1999) use the managers that are reported by the firm to have significant responsibilities, that is, the manager whose jobs are classified as being at the policy level, as the group of contestants.
2. Bognanno (2001) constructs the prize from promotion to CEO as the present value of the current year's pay gap between the average VP and CEO, assuming that both the incumbent CEO and the successor will retire at age 65.

O'Reilly et al. (1988) argue that the empirical link between CEO compensation and economic variables is neither strong nor consistent and it is sometimes disturbing to economists to note the very large gap between the salary of the CEO and that of the next level of Vice Presidents. Conventional neoclassical explanations relying on marginal product do not seem to offer a convincing explanation for these large disparities. Lazear and Rosen (1981:847) note that 'on the day that a given individual is promoted from Vice President to President, his salary may triple. It is difficult to argue that his skills have tripled in that one-day period, presenting difficulties for standard theory...however, it is not a puzzle when interpreted in the context of a prize'. In this model, Lazera and Rosen (1981) suggest that it is possible to view those competing to become CEO as competing in a tournament. A CEO's salary is seen as the result of a tournament or lottery prize.

O'Reilly et al. (1988) test the tournament model by examining the difference in compensation between the top executive and those in the next hierarchical level. They attempt to measure the number of agents who can be thought of as being in the tournament for the CEO's job as a test of the operation of tournament theory in the determination of CEO salaries. As with any tournament or lottery, the size of the prize, or the difference in economic condition between the win and no-win outcomes, reflects the number of competitors. Then other things being equal, the greater the number of competitors, the lower the chance of winning and the larger the prize should be. They define the participants in this tournament as those currently serving

as Vice President. In this model, each Vice President may give up some of the expected salary associated with his or her marginal product, or individual performance. This excess then becomes part of the lottery prize or CEO's salary. According to the tournament theory, O'Reilly et al. (1988) hypothesize that controlling for other factors, the larger the number of Vice Presidents in a firm, the greater the difference between the CEO's and average Vice Presidents' compensation levels. Controlling for other potential economic determinants, O'Reilly et al. (1988) find that the CEO's pay was negatively related to the number of Vice Presidents for a given level of Vice Presidential salaries, which is exactly opposite to the result predicted by tournament theory. However, they stress that what they have tested for is only one reasonably plausible manifestation of tournament theory. Other tests can be devised as well to test the tournament theory.

Main et al. (1993) examine the role played by the distribution of pay among the top management team by exploring the two apparently contradictory explanations of the structure of pay among top executives. On the one hand, tournament theory suggests that, in order to provide adequate incentives, it may be necessary to engineer extremely large salary differences among the top executive ranks of a corporation. On the other hand, comparatively compressed wages are more efficient since they reduce sabotage and promote cooperation and teamwork. Using executive compensation data over 210 firms and in excess of two thousand executives per year over a 5-year period, Main et al. (1993) show that the ratio of pay between levels seems to increase

markedly as one moves up the corporate hierarchy, which offers support for the tournament theory in that there is an increasing ratio of pay as one moves up the final rungs of the corporate ladder (Lazear and Rosen, 1981). Their analysis also supports the prediction of tournament theory that the size of the prize should increase with the number of contestants. However, Main et al. (1993) also point out that from a psychological viewpoint, the assumptions underlying the tournament theory appear implausible in several respects. First, there is evidence that senior management in a firm operates as a team, the work is often highly interdependent. Hence a compensation scheme that rewards independent accomplishment may be inappropriate. Second, an implicit assumption of the tournament approach is that money is the sole motivator of top executives while it is the status derived from it that may be important, and this is known through a process of social comparison. Alternatively, Main et al. (1993) introduce a measure of executive interdependence (percentage of job titles specifying profit-center heads of the total number of managers) to test executive wage compression. The results fail to support the notion of wage compression as an empirically important consideration at the top of the corporation.

Lambert et al. (1993) develop two different theoretical implications of tournament theory. First, the function describing the relationship between executive compensation and organizational level is convex. Second, the difference in compensation level of the CEO relative to the next lower position in the organizational hierarchy should be

extraordinarily large relative to the changes in compensation levels observed at other points in the hierarchy. They test the two hypotheses with detailed compensation data across the organizational hierarchy and find direct support for the tournament structure of organizational incentives. In addition, Lambert et al. (1993) test the managerial power and agency theories on compensation as well. Their results suggest that organizational incentives are most appropriately characterized by a combination of these models, rather than being completely described by a single theoretical description.

Eriksson (1999) investigates some aspects of tournament theory using data set on Danish executives. He finds that there is a stable convex relation between pay and job levels and it is relatively robust with respect to differences in how job levels are defined. In addition, the larger the number of managers considered with significant responsibilities in the firm, the larger is the wage spread, which supports the prediction of tournament models that there is a positive relationship between the number of participants and the prize of the tournament.

Conyon et al. (2001) test the tournament models in the UK context. Following previous work, they test three tournament propositions on: 1) the convex relationship between executive compensation and organizational level; 2) the positive relationship between the tournament prize (gap) and the number of contestants; and 3) the positive relationship between executive pay dispersion and corporate performance. Using data

from 100 leading UK companies, their empirical results support the first 2 propositions, that is, there is a convex relationship between executive compensation and organization level; and there is a positive relationship between tournament prize and the number of contestants. However, their research does not find a significant relationship between wage dispersion and corporate performance. Conyon et al. (2001) argue that probably wider pay variation could encourage non-cooperative behaviours among executives.

Bognanno (2001) explores factors affecting executive pay, especially as they relate to the theory of tournament theory. He argues that with executives advancing through the firm's hierarchy to reach top positions with increasing rewards from promotion, a tournament environment with promotion incentives seems to characterize the structure of corporations. These properties include (1) a relatively high rate of promotion from within; (2) a pay gap that increases with hierarchical level; (3) hierarchical levels that serve as an important determinant of pay; and (4) large rewards (in present value terms) from promotion. Evidence supports the tournament perspective in that most positions are filled through promotion, and pay rises strongly with hierarchical level. Furthermore, the winner's prize in the CEO tournament increases with the number of competitors for the CEO position. However, not all evidence is supportive, the square of the number of competitors being negatively associated with the CEO prize.

3.10 Tournament Model in the Chinese Context

The study of tournament models in China is even rarer. One reason is the lack of data on individual directors' compensation before 1998 and after 2002. Chinese listed companies only disclose their aggregate pay of the top three highest paid directors. During 1998 and 2002, there were a few companies which disclosed individual directors' pay yet this data was not available in Chinese stock market databases. The other reason is that the tournament model was originally designed and tested in capitalist economies. The model itself needs to be adjusted and adapted to the special Chinese context.

When applying the tournament model to executive compensation in Chinese listed companies, two points need to be pointed out. First, the tournament model assumes that the prize for the winner is cash or cash equivalents. In China, most Chinese listed companies are former SOEs and the Chinese government still controls the majority of the shares in the Chinese stock market (Guo and Jiang, 2003). For those CEOs and Chairmen who work in companies controlled by the government, promotion within the government and Party hierarchy is an important reward for top managers. Political promotion may be more valued than cash compensation in many cases. For example, in 2007, Guo Shengkun, the former CEO and Chairman of CHINALCO (Aluminum Corporation of China), was promoted to Party Secretary of Guangxi Province, a position which is more influential than Governor of the province in the Chinese

political system. Zhu Yanfeng, the former CEO of China FAW Group Corporation (China First Automobile Works Group Corporation), was promoted to Vice Governor of Jilin Province in 2007. Therefore in Chinese companies, the reward for the winner of the contest is

$$r_i = p_i + w_i, i = j, k, \quad (1a)$$

where p is the political reward to the winner of the contest (CEO) such as political promotion within the Chinese Communist Party; w is the cash reward to the winner of the contest.

Second, because of the dominant state ownership in the Chinese stock market, the Chinese Communist Party and the Chinese government have ultimate control over board decisions including hiring, firing and promotion of top management in Chinese listed companies controlled by the government. Therefore the contestant's output

$$q_i = \mu_i + \chi_i + \varepsilon_i, i = j, k, \quad (1b)$$

depends not only on the contestant's effort level μ and the luck component, but also on the contestant's political connection χ with the government. This suggests that the contestants do not necessarily need to increase their effort to win the contest; instead, they can build stronger political connections with the government and win the contest

without putting in more effort than the other contestant.

There are three implications of tournament model: first, the tournament model predicts that the relationship between executive compensation and organizational level is convex. Second, the tournament model predicts that the tournament prize (pay gap) and the number of contestants are positively correlated. Third, the tournament model predicts that corporate performance is positively correlated with executive pay gap (Lambert et al., 1993; Main et al., 1993; Eriksson, 1999; Conyon, 2001).

Equation (1a) shows that the reward for the winner of the contest includes both cash reward and political reward in Chinese listed companies. Whereas in capitalist economies such as US and UK, the reward for the winner of the contest includes cash (or cash equivalents) reward only. The above three implications of the tournament model needs to be adapted to the Chinese context because of the existence of the non-cash reward - political reward (or political promotion) in Chinese listed companies. For example, the first implication states that the relationship between executive compensation and organizational level is convex. In Chinese listed companies, the difference between organizational levels may not be big enough to be a convex relationship because of the existence of political reward besides the cash reward. In addition, the incentive of political promotion is likely to be higher in companies with higher state ownership, which is likely to further reduce the pay difference between organization levels.

The second implication states that the tournament prize (pay gap) and the number of contestants are positively correlated. Again, because of the existence of political incentive, the relationship between the tournament prize (pay gap) and the number of contestants is likely to be weaker in Chinese listed companies than in their western counterparts. Furthermore, the relationship between tournament prize and the number of contestants is likely to be further reduced in companies with higher state ownership. The third implication states that corporate performance is positively related to executive pay gap. The relationship is likely to be weaker in Chinese listed companies with higher state ownership because of the existence of political incentive.

3.11 Conclusion

Pavlik et al. (1993) summarize that tournament structures are desirable for two reasons. First, when managers' talents are uniform, tournament structures can be justified purely on their ability to maintain managers' incentives throughout the hierarchy. If managers' talents vary greatly, then tournaments can also help to identify the human capital of competitors. The latter is important because managers at the top of a hierarchical organization have a larger impact on the organization's success than those farther down, since their decisions affect the productivity of all lesser-ranking workers (Rosen, 1982).

Dye (1984) discusses some limitations of tournament theory. First, an employee with little perceived chance of winning may not be motivated through a tournament. Second, there may be moral hazard problems through which workers collude to reduce their effort levels, or sabotage each other's efforts. Third, when outputs are multidimensional, the determination of the tournament winner could be difficult. To confront the collusion and sabotage issues, Lazear (1989) demonstrates that where uncooperative behaviour is a concern, some pay compression within a relevant reference group can be more efficient. He stresses that pay compression may dominate tournament aspects in so-called hawkish firms in which the managers are especially good at uncooperative behavior. Baker et al. (1988) raise doubts on using promotions as an incentive device. They point to the costs of such a device in the context of failing to match the skills of the promoted person with the skills required in the promoted post.

The empirical literature on tournament theory in a business context has received relatively little attention, especially in countries other than the US. Conyon et al. (2001) propose that since board corporate governance arrangements can affect CEO pay, an important goal for future research will be to examine the effects of alternative pay distributions on individual and organizational performance, in countries with different corporate governance structures. In addition, future research may formulate theory and test hypotheses of the direct effect of different governance structures for tournament theory. There is little empirical research on tournament theory in Chinese

companies. As Conyon et al. (2001) suggest, previously established empirical tournament findings may not be universally valid and it is thus valuable to test whether tournaments do operate in the Chinese context and this is one of the objectives of this research.

Chapter 4 Literature Review (Part III)

Part III: Executive Compensation - a Simultaneous Framework

4.1 Introduction

Chapter 3 reviewed the managerial power model and the tournament model and discussed the needs to adapt them to the Chinese context. This chapter reviews the literature on the simultaneous model of executive compensation and adapts the model to the Chinese context by introducing political duality and state ownership.

Corporate governance mechanisms provide shareholders with some assurance that managers will strive to achieve outcomes that are in the shareholders' interests (Shleifer and Vishny, 1997). Shareholders have the internal, organizationally-based mechanisms of corporate control and external, market-based control mechanisms to help align the diverse interest of managers and shareholders (Walsh and Seward, 1990). Internal mechanisms include an effectively structured board, compensation contracts that encourage a shareholder orientation, and concentrated ownership holdings that lead to active monitoring of executives. The market for corporate control serves as an external mechanism that is typically activated when internal mechanisms for controlling managerial opportunism have failed (Daily et al., 2003).

One of the important issues of corporate governance is whether executive pay is adequately related to measures of company performance. Jensen and Meckling (1976) propose that establishing appropriate incentives for the agents (managers) can alleviate the agency problem. Jensen (1993) argue that the pay-performance sensitivity is too small to align the interests between managers and shareholders, whereas Ryan and Wiggins (2001) propose that the type of incentive compensation that is best for one firm may not be best for another. The variation in compensation plans is consistent with efficient contracting by firms with different board of director characteristics, ownership structure and manager-specific characteristics.

Another proposed solution to the principle-agent problem is to give managers an equity stake in the firm. Doing so helps to resolve the moral hazard problem by aligning managerial interests with shareholders' interests (Himmelberg et al. 1999). Jensen and Meckling (1976) suggest that managers deviate from shareholder wealth-maximization by consuming perquisites when they do not have an ownership stake in the firm. Accordingly, more managerial ownership aligns managerial interests with shareholder interests.

The board of directors is the central internal control mechanism for monitoring managers. As Jensen (1993) notes, the board, at the apex of the internal control system, has the final responsibility for the functioning of the firm. Most importantly, it sets the rules of the game for CEOs. The job of the board is to recruit, remove and

compensate executive directors, and to provide high-level counsel. The main characteristics that affect the monitoring potential of a board are board size, board composition and board leadership structure. Agency theorists believe that smaller board size, outsider-dominated boards and dual-leadership structure are more efficient (Fama and Jensen, 1983; Jensen, 1993; Yermack, 1996).

An alternative view is that executive compensation structure, ownership structure and board characteristics are endogenously determined and that the costs and benefits of different executive compensation, ownership and board characteristics vary across firms (Mehran, 1995). Jensen and Meckling (1976) argue that ownership structure, executive compensation structure and board composition are determined by each other and by the nature of a firm's business. These variables also influence a firm's performance. Mehran (1995) proposes that executive compensation, ownership structure and board composition are ultimately part of a simultaneous system that determines the corporation's value and the allocation of that value among various claimants. Mak and Li (2001) also argue that the corporate governance mechanisms of a particular firm reflect the tradeoffs between costs and benefits for that particular firm. Consequently, appropriate corporate governance mechanisms vary systematically across firms.

This chapter examines the literature on executive compensation, managerial ownership and board characteristics within a simultaneous system in Chinese listed

companies. The remainder of this chapter is organized as follows: Section 2 reviews the literature on executive compensation and its relationship with board characteristics. Section 3 provides a literature review on managerial ownership. Section 4 presents the literature review on board characteristics. Section 5 reviews the literature on the simultaneous relationship among executive compensation, managerial ownership and board characteristics.

4.2 The Determinants of Executive Compensation

4.2.1 Agency theory - executive compensation and performance

Agency theory is based on the theoretical principle that the firm is composed of a nexus of contracts (Coase, 1937). Agency theory can be applied to all contractual relationships. Attention here is given to the contract between shareholders and top managers of the firm. An agency relationship exists in the situation that involves the delegation of duties to an individual (agent) who is expected to act in the interest of the owner (principle) paying for the agent's services. Agency theory assumes that individuals are rational, risk-averse and tend to take actions that maximize personal welfare and minimize effort. Information asymmetry exists since executives as agents know more about organizational processes and outcomes than dispersed shareholders. This leads to a 'moral hazard' problem. Shareholders cannot directly observe the activities of management and so a potential opportunity arises for managers to pursue

their own interests instead of shareholders' interests. An incentive contract that relates management pay to performance may ensure that managers do promote shareholder wealth maximization. Jensen and Meckling (1976) argue that linking compensation to the firm's stock price performance could align the interests of managers and shareholders, which mitigates these agency problems. Demsetz and Lehn (1985: 1174) have the same opinion: 'if diffuseness in control allows managers to serve their needs rather than tend to the profits of owners, then more concentrated ownership by establishing a stronger link between managerial behavior and owner interest, ought to yield higher profit rates'.

Following Jensen and Murphy (1990), many researchers have examined the sensitivity of a manager's wealth to changes in stock price and generally agree that pay-for-performance sensitivity (PPS) is essential to effective corporate governance (Ryan and Wiggins, 2001). Some of the recent UK research on executive compensation under the agency perspective includes Conyon (1997), Benito and Conyon (1999) and Conyon and Sadler (2001), which indicate a positive relationship between executive pay and firm performance. Ke et al. (1999) find a significant positive association between return on assets and the level of compensation for publicly-held insurers, while most studies (Gregg et al., 1993; Jensen and Murphy, 1990; Main and Johnston, 1993; Firth et al., 1999) have found a non-existent, extremely weak or economically miniscule relationship between pay and performance. Aggarwal and Samwick (1999) argue that these studies are unable to support the

principal-agent model because the average level of the pay-performance sensitivity cannot be used to judge the validity of the principle-agent model. In most principal-agent models, the pay-performance sensitivity will decrease in the riskiness or variance of the firm's performance. Aggarwal and Samwick (1999) find that the pay-performance sensitivity of a manager's compensation decreases in the variance of the firm's returns, which strongly supports the principal-agent model. With over 300 studies on this topic published, there is little consensus regarding the relationship between CEO compensation configurations and firm performance (Gomez-Mejia, 1994). Rajagopalan (1997) also notes that demonstrated consistent relationships have been absent whether performance is measured as an antecedent or as a consequence of CEO compensation.

Recent studies on Chinese executive compensation also report mixed results. For example, Firth et al. (2006) find that the pay-performance sensitivities for CEOs are low in Chinese listed companies. Chen (2006) finds that executive compensation is positively related to accounting return in Chinese listed companies. Li et al. (2007) fail to find a statistically significant relationship between CEO compensation and firm performance in Chinese listed companies.

Due to the disappointment with the low pay-for-performance sensitivity, Jensen and Murphy (1990) suggest that researchers should examine factors outside an agency framework to explain CEO pay. They suggest that it is important to integrate agency

theory with other paradigms, or to empirically test the explanatory value of alternative paradigms to agency-based models.

4.2.2 Board characteristics and executive compensation

Critics of CEO compensation practices argue that because the board of directors is influenced by the CEO, the board does not structure the CEO's compensation package to maximize value for outside shareholders (Core et al, 1999). Crystal (1991) argues that boards of directors are ineffective in setting appropriate levels of compensation because outside directors are essentially hired by the CEO and can be removed by the CEO. So board members may be unwilling to take positions adversarial to the CEO, especially concerning the CEO's compensation.

Empirically, Lambert et al. (1993) and Boyd (1994) find a positive relation between CEO compensation and the percentage of the board composed of outside directors. Core et al. (1999) report that measures of board and ownership structure explain a significant amount of cross-sectional variation in CEO compensation, after controlling for standard economic determinants of pay (e.g. proxies for the firm's demand for a high-quality CEO, contemporaneous firm performance and firm risk). Moreover, CEOs earn greater compensation when governance structures are less effective. In particular, in respect to the board of director variables, they find that CEO compensation is higher when the CEO is also the board Chairman, when the board is

larger, when there is a greater percentage of the board composed of outside directors and 'gray' directors. An outside director is defined to be 'gray' if he or his employer received payments from the company in excess of his board pay. CEO compensation is also higher when outside directors are older and serve on more than three other boards. With respect to the ownership variables, Lambert et al. (1993) provide evidence that CEO compensation is lower when CEO's ownership is higher and when there is an internal member in the board other than the CEO who owns at least 5% of the shares. Core et al. (1999) argue that CEO compensation is a decreasing function of the CEO's ownership stake and the existence of an external blockholder who owns at least 5% of the equity, and the existence of a non-CEO internal board member who owns at least 5% of the shares is associated with lower CEO compensation.

Johnson et al. (1996) suggest that independent outside directors can effectively determine appropriate compensation levels. However, Baysinger and Hoskisson (1990) argue that there are potential downsides to excluding inside directors from the decision process. Also, even independent outside directors who themselves are CEOs experience some conflict in determining a peer CEO's compensation, knowing that a similar process will be applied to them as well (O'Reilly et al., 1988). Empirically, Mangel and Singh (1993) find no relationship between the proportion of outside directors and CEO compensation. Boyd (1994) finds a negative relationship between board control and CEO compensation. Board control was operationalized as a unidimensional latent variable which included the proportion of inside directors, CEO

duality, director stock ownership and institutional owner representation on the board. Conyon and Peck (1998) argue that board monitoring, measured in terms of the proportion of non-executive directors on a board, the presence of remuneration committees and CEO duality, had only a limited effect on the level of top management pay. Moreover, top management pay and corporate performance are more aligned in companies with outsider-dominated boards and remuneration committees.

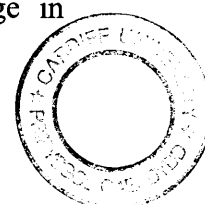
Research conducted by Yermack (1996) shows that the pay-performance relationship for CEOs decreases with board size, suggesting that small boards give CEOs larger incentives and force them to bear more risk than do large boards. Hill and Phan (1991) argue that the influence of chief executive officers over boards of directors and the likelihood that CEO's compensation packages will reflect their preferences increase with CEO company tenure. Their empirical results suggest that the relationship between CEO pay and stock returns weakens with tenure.

4.3 Managerial Ownership

Managerial ownership is a common solution to the principal-agent problem. Jensen and Meckling (1976) suggest that managers with small level of ownership fail to maximize shareholder wealth because they have an incentive to consume perquisites.

Jensen and Murphy (1990) contend that the most powerful link between shareholder wealth and executive wealth is direct ownership of shares by the CEO.

With regard to the relationship between ownership and performance, on the one hand, Demsetz and Lehn (1985) predict that when firms' ownership levels are optimally determined, there will be no relation between ownership and performance. On the other hand, researchers have also found that high managerial ownership can decrease firm value because of managerial entrenchment, as external shareholders find it difficult to control the actions of such managers (DeAngelo and DeAngelo, 1985; Stulz, 1988; Morck et al., 1988). Consistent with the existence of the two countervailing effects of interest alignment and managerial entrenchment, some researchers have found a nonlinear relationship between managerial ownership and firm performance. Demsetz and Lehn (1985) find no relation between managerial ownership and firm performance. Morck et al. (1988) find a positive relationship between ownership and firm value at low levels of ownership, a negative relationship at intermediate levels and a positive relationship at high levels. McConnell and Servaes (1990) find a positive relationship at low levels and a negative relationship at high levels—an inverted U-shaped function. However, the relation is not only weak, but also unstable. Himmelberg et al. (1999) conclude that these studies generally interpret the positive relationship at low levels of managerial ownership as evidence of incentive alignment, and the negative relation at high levels of managerial ownership as evidence that managers become 'entrenched' and can indulge in



non-value-maximizing activities without being disciplined by shareholders. Krole (1995) examines the differences in data sources used in several studies and concludes that differences in firm size can account for the reported differences between those studies.

Cui and Mak (2002) find that Tobin's Q initially declines with managerial ownership, then increases, then declines again and, finally, increases again - a w-shaped relationship. Short and Keasey (1999) have extended the US-based literature to the UK and find a non-linear relationship between firm performance and managerial ownership. Singh and Davidson III (2003) find that in large publicly-traded corporations, managerial ownership significantly alleviates principal-agent conflicts, even in the presence of other agency deterrent mechanisms.

Loderer and Martin (1997) argue that an unresolved question in the previous studies on managerial ownership is the direction of causality. Do executives make better decisions because they own more stock, or do they hold more stock because their firms have better prospects? They attempt to answer that question by allowing for both effects in a simultaneous equations framework. There are two main implications of their findings: first, the causality runs from performance to ownership rather than the other way. Second, there is little empirical support for the notion that agency problems in large publicly-traded firms can be reduced by arbitrarily forcing executives to hold more stock.

Core and Larcker (2002) choose an alternative approach by relaxing some of the strong assumptions of the prior research. They assume that firms choose optimal managerial equity incentives when they contract, but that transaction costs prohibit continuous re-contracting. Because contracting is not continuous, firms' ownership levels gradually deviate from the optimal level. They predict that firms that are below optimum can improve their performance by increasing ownership levels, and that a subset of these firms can benefit sufficiently from the increased performance. Empirically, they examine sample firms that adopt 'target ownership plans', under which managers are required to own a minimum amount of stock. They find that excess accounting returns and stock returns are higher after the plan is adopted. Thus for their sample of firms, the required increases in the level of managerial equity ownership result in improvements in firm performance.

Himmelberg et al. (1999) propose an equilibrium interpretation of the observed differences in ownership structures across firms. Rather than interpret low ownership levels as per se evidence of sub-optimal compensation design, they argue that the compensation contracts observed in the data are endogenously determined by the contracting environment, which differs across firms in both observable and unobservable ways. They conclude that previous studies fail to control for unobserved firm heterogeneity that affects both ownership and performance and hence their results, subject to inconsistent estimators, are likely to be outcomes of spurious correlations. The principle findings are: 1. proxies for the contracting environment

faced by the firm (observable firm characteristics) strongly predict the structure of managerial ownership; 2. managerial ownership and firm performance are determined by common characteristics, some of which are unobservable; 3. they use instrumental variables as an alternative to fixed effects to control for the endogeneity of managerial ownership and find some evidence to support a causal link from ownership to performance, but this evidence is tentative because of the weakness of the instruments. Kole (1996) also argues that managerial ownership is endogenous and that causality operates in the opposite direction, from performance to ownership.

By contrast, Zhou (2001) shows that managerial ownership, while substantially different across firms, typically changes slowly from year to year within a company. With rational managers maximizing long-term utility, small, one-year changes in ownership are not likely to reflect notable changes in incentives that would lead to substantive within-year changes in performance and by relying on within-variation, fixed effects estimators may not detect an effect of ownership on performance even if one exists. In addition, Hermalin and Weisbach (1991) argue that managerial shareholdings are likely to be related to corporate performance for two reasons: first, managers will exercise their stock options after their stock goes up, but not after it goes down; second, managers with information about good future prospects are likely to buy more stock, while managers with bad information about their own stock are likely to sell. Both explanations suggest that we will observe a positive relation

between corporate performance and shareholdings that has nothing to do with performance.

4.4 Board of Directors

Most organizations are governed by a board of directors (Hermalin and Weisbach, 2003). While the board is not simply a product of regulation, governing boards are prevalent all over the world, in a variety of for-profit and nonprofit organizations and the existence of governing boards predates these regulations. Hermalin and Weisbach (2003) have noted that the size of board tends to be much larger than required by law and they suggest that boards are a market solution to an organizational design problem, an endogenously determined institution that helps to ameliorate the agency problems that plague any large organization.

Johnson et al. (1996) find that the literature provides little consensus on the specific configuration of an effective corporate board. The lack of consensus may result from the multiple roles fulfilled by directors. Clearly, the proposition of multiple and in some cases contradictory roles for the board of directors is differentially supported as a function of the chosen theoretical perspective. The role of boards in contemporary organizations is concluded by Zahra and Pearce II (1989) as:

1. The legalistic perspective approach suggests that boards contribute to the performance of their firms by carrying out their legally mandated responsibilities. Advocates of this approach posit that corporate laws vest considerable powers in directors to enable them to fulfill their roles.
2. The resource-dependence perspective views the board as important boundary spanners that make timely information available to executives. Furthermore, because of their prestige in their professions and communities, directors are able to extract resources for successful company operations.
3. The class hegemony perspective views the board as a means of perpetuating the powers of the ruling capitalist elite. In particular, board membership is said to reflect a shared commitment among the ruling capitalists to control social and economic institutions, hence wealth.
4. The agency theory views the board as the ultimate mechanism of corporate control. Within this perspective, boards perform the critical function of monitoring and rewarding top executives to ensure maximization of shareholders' wealth.

Johnson et al. (1996) classify directors' responsibilities into three broadly defined roles: control, service and resource dependence. The control role entails directors monitoring managers as fiduciaries of stockholders. The service role involves

directors advising the CEO and top managers on administrative and other managerial issues, as well as more actively initiating and formulating strategy. The resource dependence role views the board as a means for facilitating the acquisition of resources critical to the firm's success.

Concerns regarding the board's ability to fulfill the control role have typically focused on board independence. Three measures of board independence, board composition, board leadership structure and board size, are discussed below.

4.4.1 Board composition

4.4.1.1 Inside/outside/affiliated directors

Inside directors have generally been defined as those directors also serving as firm officers, with outside directors being classified as all non-management members of the board. Increasingly, researchers question the ability of the traditional inside/outside director distinction to appropriately capture the independence of the outside director (Daily and Dalton, 1994). Having studied three widely used operationalizations of board composition which are a proportion of inside directors, proportion of outside directors and a proportion of affiliated directors, Daily et al., (1999) find that different board composition measures appear to reflect different theoretical concepts such as agency theory, legalistic theory, resource dependence

theory and class hegemony theory. The Securities and Exchange Commission (SEC) has provided specific guidance for determining director independence. Directors meeting any of the following criteria are referred to as ‘affiliated directors’ and are considered to be characterized by a lack of independence:

- Employment by the firm or an affiliate within the past five years
- Family relationship by blood or marriage with a top manager or other director
- Affiliation with the firm as a supplier, banker or creditor within the past two years
- Affiliation with the firm as an investment banker within the past two years or within the upcoming year
- Association with a law firm engaged by the corporation, and
- Stock ownership resulting in the SEC designation of the control person.

Interdependent directors are those directors who were appointed during the tenure of the current CEO; independent directors are classified as those outside directors who were appointed to the board by a prior CEO (Daily et al. 1999).

4.4.1.2 Board composition and firm performance - an agency perspective

A preference for outside-dominated boards is largely grounded in agency theory (Dalton et al. 1998). Agency theory is built on the notion that the separation of

ownership from control, as is characteristic of the modern corporation, potentially leads to self-interested actions by the agents-managers. As managers gain control in the firm, they may be able to pursue actions which benefit themselves at the shareholders' expenses (Jensen and Meckling, 1976). From the agency perspective, board independence has focused on the role of outside directors in limiting the potential agency costs when decision-making and decision-control are separated. It is argued that by monitoring management, outside directors can limit the exercise of managerial discretion, thus lowering contracting costs between shareholders and management (Fama, 1980; Fama and Jensen, 1983). Fama and Jensen (1983) also argue that outside directors have an incentive to act as monitors of management because they want to protect their reputations as effective independent decision-makers. Weisbach (1988) shows that outside-dominated boards are more likely than inside-dominated boards to respond to poor performance by suggesting to replace CEO. So an outside-dominated board is expected to lead to a better firm performance.

Affiliated directors, who are potentially influenced by the CEO vis-à-vis personal, professional, and /or economic relationships, are considered to be less effective monitors of firm management because board decisions are typically decided by majority vote, boards comprised predominately of independent directors are expected to more effectively monitor management self-interest than are boards with higher proportions of dependent directors (Johnson et al. 1996). Directors engaged in

personal services contracts with the focal firm, as in the case of consultants or lawyers, may feel a sense of obligation to the CEO, who is almost certainly instrumental in the establishment of such a relationship. Similar arguments apply to affiliated directors who represent organizations involved in substantive relationships with the focal organization (e.g. suppliers, customers, or creditors). These directors may be hesitant to challenge a CEO who has the discretion to sever an important economic relationship (Johnson et al. 1996). According to agency theory, a board with more affiliated directors would be less independent. The affiliated directors are more likely to be manipulated by the self-serving managers with various entrenchment practices (Walsh and Seward, 1990). Thus the proportion of affiliated directors on the board is expected to be negatively related to firm performance.

Empirically, Ezzamel and Watson (1993) test measures suggested by agency theory using a sample of UK companies, such as the proportion of non-executive board members. Their results indicate that these measures have a direct impact on corporate performance in their own right, though the main impact is indirect through interactions with organizational form variables. Rosenstein and Wyatt (1990) examine the wealth effects surrounding outside-director appointments and find significantly positive share-price reactions. The results are consistent with the hypothesis that outside directors are chosen in the interest of shareholders.

4.4.1.3 Board composition and firm performance - a stewardship perspective

By contrast, stewardship theory suggests a reliance on a preponderance of inside directors. Stewardship theory argues that managers are good stewards of the corporation and diligently work to attain high levels of corporate profit and shareholder returns (Donaldson and Davis, 1994). In stewardship theory, the model is based on a steward whose behaviour is ordered such that pro-organizational, collectivistic behaviours have higher utility than individualistic, self-serving behaviors. Given a choice between self-serving behavior and pro-organizational behavior, a steward's behaviour will not depart from the interests of his or her organization. Even where the interests of the steward and the principal are not aligned, the steward places higher value on cooperation than defection. And because the steward perceives greater utility in cooperative behaviour and behaves accordingly, his or her behaviour can be considered rational (Davis et al. 1997). Stewardship theory suggests that control should be centralized in the hands of firm managers. Many other researchers have also noted the potential benefits of inside directors (Baysinger and Hoskisson, 1990; Boyd, 1994). Baysinger and Hoskisson (1990) suggest that the superiority of the amount and quality of inside directors' information may lead to more effective evaluation of top managers. Consistent with stewardship theory, some studies show that inside directors are associated with higher firm performance (Kesner, 1987; Dalton et al. 1998). On the other hand, many researchers argue that there is little evidence to suggest that board composition has any cross-sectional relationship to firm performance (Hermalin and Weisbach, 1991;

Mehran, 1995; Klein, 1998). Hermalin and Weisbach (1998) argue that an important issue to consider when evaluating these studies is the endogeneity of board composition; they suggest that poor performance leads to increased board independence. Hermalin and Weisbach (1991) have attempted to correct for this effect using simultaneous-equation methods. Still, even after correcting for endogeneity, there does not appear to be an empirical relationship between board composition and firm performance.

4.4.1.4 The determinants of board composition

The traditional financial economics view of the determinants of board composition is based on outside shareholders' demand for external monitoring of management (Arthur, 2001). Hermalin and Weisbach (1988) examine whether firm performance, CEO tenure and changes in market structure lead to changes in board composition. Their results suggest that outside directors are more likely to join and inside directors more likely to leave a board after poor firm performance, when firms leave product markets, and possibly when there is a new CEO. When their CEO nears retirement, firms tend to add inside directors who may be possible candidates for the next CEO. Just after a CEO change, inside directors with short tenures appear more likely to leave the board. Bathala and Rao (1995) propose that individual firms choose an optimal board composition depending upon alternative mechanisms employed by the firm to control agency conflicts. The empirical results are consistent with their

hypothesis and board composition is also found to be systematically related to a number of other variables, including institutional holdings, growth, volatility and CEO tenure.

Hermalin and Weisbach's (1998) model has board composition as the outcome of a bargaining process between the CEO and the rest of the board. The model predicts that the bargaining power of the CEO relative to the rest of the board of directors will determine the level of independence of the board and the extent of board monitoring. Arthur (2001) tests Hermalin and Weisbach's model and finds strong evidence that representation by outside directors varies inversely with CEO bargaining power, which is proxied by CEO tenure and inside shareholdings.

Lynall et al. (2003) develop a theory to show how board composition and, consequently, firm performance are a reflection of both the firm's life cycle stage and the relative power of the CEO and external financiers at the time of founding. They apply life cycle theory to examine the firm during 'adolescence' and suggest that both the relative power of the CEO/external financier as key stakeholders and the stage of a firm's life cycle in which the board is formed will greatly influence its composition. They contend that boards carry with them vestiges of their history and traditions, and as a result, board composition is relatively persistent, despite the changing needs of boards as firms move through the life cycle from adolescence to maturity. One implication of this logic is that in research focused on boards of mature, older firms,

scholars may not find a relationship to firm performance, because these boards reflect anachronistic attributes unadjusted to the firms' present situations and needs. They argue that it is not a question of whether existing theories are helpful to our understanding of boards and firm performance but, rather, a question of when each is helpful.

Daily et al. (1999) identify over two dozen operationalizations of board composition from empirical literature. They argue that it is this inconsistency of operationalization that may contribute to the lack of consensus regarding the relationship between board composition and corporate performance.

4.4.2 Board leadership structure

The duality of CEO and board Chairman is another measurement of board independence. There have been extensive theoretical debates over the effect of CEO duality on corporate performance. Agency theorists argue that the separate leadership structure is more effective in carrying out its monitoring role. As noted by Finkelstein and D'Aveni (1994), duality promotes CEO entrenchment by reducing board monitoring effectiveness. Booth et al. (2002) argue that when the CEO also serves as board Chairman, the organization concentrates the management's power and board leadership in one person's hands. Because this concentration of power can exacerbate potential conflicts of interest, it may result in agency problems and increase the need

for an independent board. Rechner and Dalton (1991) find that firms with a separate board leadership structure outperformed those firms with a joint structure when relying on return on equity, return on investment, and profit margin. Baliga et al. (1996) argue that maintaining duality:

1. constrains board independence and reduces the possibility that the board can properly execute its oversight and governance role;
2. signals the absence of separation of decision management and decision control...the organization suffers in the competition for survival (Fama and Jensen, 1983);
3. makes it difficult for insecure directors to be honest when evaluating firm performance which, in turn, leads to long term organizational drift (Carver, 1990).

In contrast to agency theory, several perspectives such as administrative theory, strategy formation literature and stewardship theory propose that CEO duality would promote rather than hinder firm performance (Finkelstein and D'Aveni, 1994; Dalton et al. 1998). According to these theories, the separation of CEO and Chairman may attenuate strong leadership at the top because it engenders ambiguity and diffusion of power. An additional problem with non-duality is that it weakens and disrupts the

CEO's ability to manage the task environments their organizations face. At last, strong leadership may be viewed as an organizational characteristic that confers legitimacy, sending a signal to stakeholders that a firm has a clear sense of direction. By legitimizing a firm's activities and invoking a sense of managerial efficacy, a dual structure can help a firm maintain needed resource relationships with stakeholders (Finkelstein and D'Aveni, 1994).

Attempting to reconcile the two perspectives, Finkelstein and D'Aveni (1994) propose a contingency model of CEO duality. They argue that the association between CEO duality and board vigilance changes with circumstances - with a vigilant board considering duality to be less desirable when firm performance is good and the CEO possesses substantial informal power.

Empirically, some researchers find that the separation of CEO and Chairman reduce agency costs in corporations and improves firm performance (Rechner and Dalton, 1991; Pi and Timme, 1993; Baliga et al., 1996 and Dahya, et al., 2002). By contrast, Baliga et al. (1996) find that there is only weak evidence that duality affects long-term performance, after controlling for other factors that might impact the performance. Dalton et al. (1996) note that there is a stream of research which has noted no directional impact of the board leadership structure on a firm's financial performance. Neither the joint, nor separate, board leadership structure has been strongly supported as enhancing a firm's financial performance. They argue that these

findings support the need to consider multiple theoretical explanations for the relationship between board leadership structure and firm performance.

Brickley et al. (1997) note that the separating the posts of CEO and Chairman has potential costs, as well as potential benefits. The costs of a dual leadership structure include agency costs, information costs, costs of changing the succession process and so forth. Their evidence suggests that the costs of separation are larger than the benefits for most large firms. Palmon and Wald (2002) argue that there is no optimal leadership structure. They examine and confirm that small firms benefit more from the clarity and decisiveness of decision-making under a single executive, while large firms benefit more from the checks and balances of having two executives in the positions of CEO and Chairman.

In the Chinese context, the decision-making power is shared among CEO, Chairman and Secretary of the CCP's committee in the company if the company is state-controlled. It is rare that CEO, Chairman, and Party Secretary are the same person in a Chinese listed company. But in most cases, Chairman and Party Secretary is the same person to avoid conflict between the Party Secretary and top managers. Therefore the concept of 'political duality' is initiated in this thesis to represent the Chairman/Party Secretary duality in Chinese companies.

4.4.3 Board size

Resource dependence theory suggests that increased size and diversity may yield benefits by creating a network with the external environment and securing a broader resource base (Pearce and Zahra, 1992). Research on board interlocks may also provide a rationale for expecting larger boards to be associated with positive corporate performance. A larger board with more CEO members may offer an exceptional level of high quality advice and counsel to a CEO (Dalton et al. 1999). Dalton et al. (1999) find non-zero, positive and true population estimates of board size-performance relationships.

Agency theory suggests that large boards are less effective than small boards. The idea is that when boards become too big, agency problems, such as director free-riding, increase within the board and the board becomes more symbolic and less a part of the management process (Hermalin and Weisbach, 2003). Furthermore, smaller boards would have more group cohesiveness (Jensen, 1993). Larger boards may be less participative, less cohesive and less able to reach consensus. Goodstein et al. (1994) report that board size inhibited strategic change through reorganization. Yermack (1996) demonstrates that board smallness was associated with higher market evaluations as well as higher returns on assets and returns on sales. He concludes that whatever benefits may be associated with board largeness may be overwhelmed by poor communication and a poor decision-making process.

Dalton et al. (1999) argue that current literature provides no consensus about the relationship between board size and firm performance. Previous literature describes board composition-performance links as ‘vexing’, ‘contradictory’, ‘mixed’ and ‘inconsistent’ (Zahra and Pearce, 1989; Finkelstein and Hambrick, 1996; Johnson et al., 1996). Dalton et al. (1998) find no evidence of substantive relationships between board composition and financial performance. Dalton et al. (1999) find systematic evidence of nonzero, positive, true population estimates of board size-performance relationships.

4.5 Executive Compensation, Board Ownership and Board of Directors - a Simultaneous Framework

To reduce the agency cost, previous research suggests that linking managers’ compensation to firm performance motivates them to make more value-maximizing decisions (Holmstrom, 1979; Jensen and Murphy, 1990). Mehran (1995) suggests that shareholders do not set executive compensation, they elect directors who have the exclusive right under corporate law to manage the corporation. Among the most important of directors’ tasks is to set the level and structure of the compensation. This raises the issue of how the composition of the board affects the structure of executive compensation. Critics of CEO compensation practices argue that because the boards of directors are influenced by the CEO, the boards do not structure the CEO’s compensation package to maximize value for outside shareholders (Core et al., 1999).

Crystal (1991) argues that boards of directors are ineffective in setting appropriate levels of compensation because outside directors are essentially hired by the CEO and can be removed by the CEO. As a result, board members maybe unwilling to take positions opposite to the CEO, especially in relation to the CEO's compensation. Moreover, the board usually relies on compensations consultant hired by the CEO, and this may lead to compensation contracts that are optimal for the CEO, but not for the firm.

The alternative perspective argues that executive compensation, ownership structure and board structures are endogenously determined. In this perspective, the corporate governance mechanisms of a particular firm reflect the tradeoffs between costs and benefits for that particular firm (Mak and Li, 2001). Agrawal and Knoeber (1996) argue that since alternative control mechanisms exist, greater use of one mechanism need not be positively related to firm performance. Where one specific mechanism is used less, others may be used more, resulting in equally good performance. The extent to which several of the control mechanisms, for example insider shareholdings, the proportion of outside directors on the board, executive compensation and so forth, are used is decided within the firm. These choices are expected to be made to maximize firm value. Where the external mechanisms exist, mechanisms need not be chosen to maximize firm value. Consequently, a cross-sectional search for the effects of all mechanisms on firm performance that

properly accounts for their interdependence should find no effect for the internally chosen mechanisms but may find an effect for those chosen externally.

The relationship between executive compensation and board composition has been examined in many previous empirical papers. Mehran (1995) examines the relationship between the composition of the board and the structure of executive compensation. In his model, executive compensation, ownership structure and board composition are ultimately part of a simultaneous system that determines the corporation's value and the allocation of that value among various claimants. The evidence shows that outsider-dominated boards are likely to make greater use of equity-based compensation. By contrast, insider-dominated boards are likely to be more responsive to the interests of top management and will thus use proportionately more fixed cash compensation. Core et al. (1999) find that CEO compensation is a decreasing function of the percentage of the board composed of inside directors, and is an increasing function of board size, the percentage of outside directors who are over age 69, the percentage of outside directors who serve on three or more other boards (six or more other boards if retired) and whether the CEO also is board Chairman.

Other studies have examined the relationship between ownership structure and executive compensation. Holderness and Sheehan (1988) provide evidence that managers who are majority shareholders in publicly-held corporations receive

marginally higher salaries than other officers. Core et al. (1999) find that CEO compensation is a decreasing function of the CEO's ownership stake. In addition, CEO compensation is lower when there is a non-CEO internal board member or an external blockholder who owns at least 5% of the shares. Mehran (1995) finds a negative relationship between the percentage of executives' equity-based compensation and their percentage equity holdings, indicating that the board considers executives' total incentives in designing pay packages. However, Allen (1981) finds that the level of CEO compensation is a decreasing function of the equity held by the CEO (and his family), as well as the extent of equity holdings by board members not related to the CEO.

4.6 Conclusion

This chapter reviews the literature on executive compensation in a simultaneous framework. The relationship between executive compensation, executive ownership, board characteristics and firm performance is discussed.

Agency theorists suggest that making a greater percentage of a manager's compensation equity-based is the way to tie pay to performance (Jensen and Murphy, 1990). Critics of CEO compensation practice argue that because the board of directors is influenced by the CEO, the board does not structure the CEO's compensation package to maximize value for outside shareholders (Core et al, 1999). Core et al.

(1999) find that measures of board and ownership structure explain a significant amount of cross-sectional variation in CEO compensation, after controlling for standard economic determinants of pay. Moreover, the signs of the coefficients on the board and ownership structure variables suggest that CEOs earn greater compensation when governance structures are less effective. Mehran (1995) suggests that executive compensation, ownership structure and board composition are ultimately part of a simultaneous system that determines the corporation's value. Agrawal and Knoeber (1996) examine the effect of multiple monitoring mechanisms to control manager-shareholder agency problems on firm performance within a simultaneous framework. They argue that the existence of alternative control mechanisms and their possible interdependence also make regressions relating the use of any single mechanism to firm performance difficult to interpret. Because such regressions fail to consider interrelations among the control mechanisms, any findings may be spurious.

Part I, II and III of the literature review discussed the managerial power model, tournament model and simultaneous model of executive compensation respectively. All three models are related to agency theory. Managerial power models integrate agency model with resource dependency theory. The tournament model is complimentary to the existing agency model which uses pay-for-performance as an incentive to motivate top managers, instead, the tournament model uses the organizational compensation structure as an alternative incentive for top managers.

The simultaneous model combines the agency model with other models such as the managerial power model, but accepts the endogenous nature of executive compensation, executive ownership and board characteristics.

All three models have been adapted to or evaluated in the Chinese context. In the managerial power model, a new and important power dimension - political power - is introduced to the model for Chinese listed companies. The tournament model also needs to be adapted to the Chinese context by acknowledging the non-cash reward or political reward to top managers in Chinese listed companies. Finally, a new variable (political duality, which represents the combined position for Chairman and Party Secretary) has also been introduced to the simultaneous model in Chinese listed companies.

Chapter 5 Research Hypotheses

5.1 Introduction

Tosi and Gomez-Mejia (1989) propose that some researchers have ignored the process aspects of executive compensation, instead treating this complex organizational system as a ‘black box’. Most of the economics-based research on executive compensation uses principle-agent models. Barkema and Gomez-Mejia (1998) propose that to move the executive compensation research forward requires greater efforts to be devoted to examining alternative mechanisms and criteria for how top management compensation is set. This thesis focuses on three under-researched theories on executive compensation: managerial power theory, tournament theory and simultaneous framework of executive compensation.

Although there have been some empirical studies on executive compensation based on above the three models, the empirical evidence from China is very limited. As previously established empirical findings on executive compensation may not be universally valid, it is thus valuable to test whether the tournament model, managerial power model and simultaneous model do operate in the Chinese context. However, considering the unique Chinese context, all three models need to be adapted to the Chinese context. In other words, attention should be paid to the Chinese context when

raising research hypotheses.

Having reviewed the literature on the tournament model, managerial power model and simultaneous model in Chapters 3 and 4, this chapter focuses on the research hypotheses and their application in China. Each theoretical model is briefly reviewed, supported by a discussion on how it should be adapted to the Chinese context. In total, 5 research hypotheses are developed. Finally, a brief conclusion is drawn.

5.2 Power as a Determinant of Executive Compensation

According to managerialists, the missing link between executive pay and firm performance is a power imbalance between executives and shareholders (Tosi et al., 1999). Grabke-Rundell and Gomez-Mejia (2002) argue that agency theory implicitly acknowledges the existence of power in the relationship between executives and shareholders. Agency theory suggests that the power imbalance favours the executives, allowing them to pursue their self-interests in the form of large pay packages. Most empirical studies on the association between executive compensation and firm performance have been using agency theory. They argue that because of its roots in economic discipline, agency theory has led researchers to test financial rather than behavioral hypotheses.

Following Finkelstein's (1992) power dimension model, Grabke-Rundell and

Gomez-Mejia (2002) offer an alternative view on executive compensation and propose a managerial power-executive compensation model. By incorporating behavioral conjectures of power into the agency theory framework, Grabke-Rundell and Gomez-Mejia (2002) provide a comprehensive approach to testing the determinant of executive compensation. They combine agency theory with resource dependency theory and with specific measures of power developed by Finkelstein (1992) for a more complete executive pay model.

Following Finkelstein's definition of managerial power, Lambert et al. (1993) define power as the ability of managers to influence or exert their will or desires on the remuneration-decisions made by the board of directors, or perhaps the compensation committee of the board. Finkelstein (1992) presents a set of dimensions measuring top managers' power including structural power, ownership power, expert power and prestige power. By incorporating behavioral conjectures of power into the agency theory framework, Grabke-Rundell and Gomez-Mejia (2002) provide a comprehensive approach to testing the determinant of executive compensation. They combine agency theory with resource dependency theory, and with specific measures of power developed by Finkelstein (1992) for a more complete managerial power - executive pay model.

Structural power is related to the formal positions within an organization. It increases as one moves up the hierarchical ladder. The greater the manager's

structural power, the greater is his or her control over colleagues' actions. CEOs have high structural power over other members of dominant coalitions because of their formal organizational position (Finkelstein, 1992). Grabke-Rundell and Gomez-Mejia (2002) propose that structural power over the internal directors should allow executives to pursue self-interests, including a large compensation package.

Stock ownership is also a very important source of power within corporations. Lambert et al. (1993) argue that the CEO or other very senior-level executives can amass power by using their personal wealth to accumulate equity ownership in the firm. Grabke-Rundell and Gomez-Mejia (2002) argue that as legal owners of the firm, shareholders are given the right to vote and influence strategic decisions, and power increases along with the percentage of shares owned. Moreover, executive shareholders are in the position to influence board decisions, his or her performance criteria and to increase their compensation. Grabke-Rundell and Gomez-Mejia (2002) propose that CEO stock ownership has a positive effect on the magnitude of the overall executive compensation package.

In Chinese listed companies, CEO shareholdings are usually very small (Wei, 2000; Lin et al., 2002; Zhang, 2003). According to a study by Shanghai Rongzheng (2003), more than 60% of top management in their study has 'zero ownership' in 2002. Therefore in China, it is unlikely for executives to exert ownership power to influence board decisions including his or her compensation package design, due to the

insignificant executive ownership. Instead, besides its function as a supplement to executive compensation (Li, et al. 2007), executive ownership in Chinese listed companies can be considered to be an important indicator of structural power. In support of this view, Tenev and Zhang (2002) find that the Chinese government allocates shares to the CEO based on his or her rank in the managerial hierarchy. CEO shareholding thus provides an indicator of the CEO's standing in the company and should be considered to be an indicator of structural power. The higher executive ownership therefore indicates the higher structural power. The structural power over the internal directors should allow executives to pursue self-interests, including a large compensation package. Therefore the following hypothesis has been made:

Hypothesis 1a: the level of executive compensation is positively related to the level of executive structural power in the Chinese listed companies.

The Chinese government often retains sufficient shares to maintain voting control of the state-owned enterprises. Moreover, although the CCP/government has greatly lessened the control over operational issues in the listed SOEs since the 1980s, the CCP still plays an important role. The government retains ultimate decision rights concerning mergers and acquisitions and the disposal of shares and assets of these listed firms, as well as decision rights on the appointment of CEOs (Fan et al., 2007). In a Chinese listed company with a dominant state ownership, the control power and decision rights are shared among the Secretary of the Chinese Communist Party's

committee at the company, Chairman and CEO. The government retains the right to appoint and remove the CEO/Chairman, evaluate the CEO'/Chairman's performance and reward or punish the CEO/Chairman. As the government is led by the Party, eventually the Party has ultimate control over those listed companies with dominant state ownership. As a result, the Secretary of the Party committee at the company, who is the official representative of the Party in the company, is in a strong position to influence board decisions. For example, according to the 'Regulations of Appointment and Dismissal of Top Management' of SASAC Shenzhen Branch, the Party Secretary and Chairman should be consulted about the appointment of the CEO. Moreover, since the Chairman and CEO are very likely to be a member of the CCP, theoretically, they have to follow the orders of the Party Secretary. In practice, the Party Secretary is often associated with the post of Chairman or CEO to avoid conflict between the Party Secretary and top managers. Therefore, when an executive director also serves as a Party Secretary, his or her power becomes stronger. This dominant power over other directors would allow the Chairman/Party Secretary to pursue self-interests which includes a large compensation package. Therefore, the following hypothesis has been made:

Hypothesis 1b: the level of executive compensation is positively related to the level of executive political power in the Chinese listed companies.

Grabke-Rundell and Gomez-Mejia (2002) also propose that when the executive has

had plentiful experiences with the firm, board members may become dependent on the executive for knowledge regarding the best use of the organization's resources. The executive can take advantage of the board members' dependency to justify a higher pay package. Hence they argue that CEO expert power has a positive effect on the executive's total compensation level. Moreover, Grabke-Rundell and Gomez-Mejia (2002) argue that prestige acts as a symbol of power and provides a means by which resource information can be obtained. Therefore, Grabke-Rundell and Gomez-Mejia (2002) propose that CEO prestige power has a positive effect on the executive's total compensation level. Expert power and prestige power are not examined in this study because of the unavailability of data in Chinese listed companies.

5.3 Executive Compensation and Tournament Theory

Executive compensation and its relationship to corporate performance has become an important issue in managerial, economic, accounting and financial circles. Critics question the effectiveness of compensation contracts to align manager and shareholder interests and the effectiveness of the labor market for executives. Most empirical studies have emphasized incentive effects (Pavlik, et al. 1993). While the research on executive compensation does establish a link between executive compensation and economic variables, the links are neither strong nor consistent. It is sometimes disturbing to economists to note the very large gap between the salary of

CEO and those of the next level of Vice Presidents. Conventional neoclassical explanations relying on marginal product do not seem to offer a convincing explanation for these large disparities (O'Reilly et al., 1988). In response to this incongruity, Lazear and Rosen (1981) propose a theory to explain executive salary differentials. Lazear and Rosen (1981) argue that on the day that a Vice President is promoted to President, his or her salary may triple. It is difficult to argue that his or her skills have tripled in that one-day period, presenting difficulties for standard theory.

Lazear and Rosen (1981) consider a rank-order payment scheme which has not been analyzed but which seems to be prevalent in many labour contracts. This scheme pays prizes to the winners and losers of labour market contests. The main difference between prizes and other incentive schemes is that in a contest, earnings depend on the rank order of contestants. That is, salaries are not contingent upon the output level of a particular game, because prizes are fixed in advance. If inexpensive and reliable monitors of effort are available, then the best compensation scheme is a periodic wage based on input. However, when monitoring is difficult, so that workers can alter their input with less than perfect detection, the situation can often be improved if compensation is related to a more easily measured output level. When monitoring costs are so high that moral hazard is a serious problem, the gain in efficiency from using output-based pay may outweigh the risk-sharing losses. It is for these reasons that it is sometimes a better way to bring about an efficient incentive structure.

Lazear and Rosen (1981) suggest that it is possible to view those competing to become CEO as competing in a tournament. The theory specifies that the prizes are fixed in advance and agents (tournament participants) expend effort to increase the likelihood of winning a prize. Analogous to a sports game, what matters for winning is not the absolute level of performance, but how well one does in relation to other competitors (Conyon et al., 2001). Rosen (1986) argues that top prizes of a disproportionate size are theoretically necessary to motivate tournament survivors so they will not rest on past achievements or winnings as they enter the final contest. Raising the top prizes has the effect of lengthening the career ladder for high-ranking contestants. In this manner salaries differ from realized marginal products, and the gap between CEO and Vice Presidential salaries can be explained as the operation of a tournament.

O'Reilly et al. (1988) define the participants in the tournament as those currently serving a Vice President. In the tournament scheme, each Vice President may give up some of the expected salary associated with his or her marginal product, or individual performance. This excess then becomes part of the lottery prize realized as the CEO's salary. The use of contests in the design of remuneration packages is particularly attractive when there are substantial monitoring costs.

According to previous literature, there are mainly three predictions of tournament theory on executive compensation. First, tournament theory predicts a convex

relationship between executive compensation and organizational level. Second, tournament theory predicts that the tournament prize (gap) and the number of contestants are positively correlated. Third, tournament theory predicts that corporate performance is positively correlated with executive wage dispersion (O'Reilly et al., 1988; Lambert et al., 1993; Eriksson, 1999; Conyon et al., 2001).

5.3.1 Tournament model in Chinese listed companies

As discussed in chapter 2, when applying the tournament model to executive compensation in Chinese listed companies, two issues need to be pointed out. First, the tournament model assumes that the prize for the winner is cash or cash equivalents. However, this assumption appears to be less valid in the Chinese context.

Although China has gradually moved away from the centrally planned economic system since the 1980s, today the Chinese economy is still largely controlled by central and local government. For example, the state or the government owns all the land properties and most banks are state-controlled. There is close interaction between the Chinese government and listed companies. Competent government officials are sent by the government to run SOEs. However, on the other hand, in order to run the state business efficiently, the government also promotes competent managers in SOEs to senior positions such as Governor, Minister or Mayor in central and local government. The SOEs are often referred to as 'officials—brooder' and only the top

performers in the SOEs will be selected and promoted to senior positions in the government.

In China, senior government officials enjoy a high social status the high job security, as well as a variety of lifelong benefits including housing subsidies, better medical treatment, a government-paid car and driver and so forth. As a result, for those CEOs and Chairmen who work in companies controlled by the government, promotion within the Party/Government hierarchy is an important reward.

Therefore, it is reasonable to expect that the tournament cash incentive is weaker in Chinese listed companies controlled by the government compared to companies in western countries for the following reasons: firstly, as explained above, the existence of strong non-cash incentive—political promotion makes the tournament cash incentive weaker. Secondly, CEO compensation in listed companies controlled by the government is usually capped by the Chinese government, which makes the tournament prize less attractive. Culturally, China is a society with a high level of collectivism (Hofstede, 2001). One feature of collectivism is the great emphasis on internal equality, sometimes on egalitarianism. Politically, China is a socialist country, which emphasizes ‘harmony’ and ‘equality’. Therefore, there is public expectation of ‘reasonable’ pay dispersion. In most SOEs, the socialist approach (with great emphasis on minimizing the pay gap between top managers and workers) is dominant and in most cases, there is a policy of capping managers’ compensation package at

certain multiples of the normal worker's wage of the corporation (Rui et al., 2003), typically ranging between 3 to 15 times. Therefore, the emphasis on 'harmony' and 'equality' and 'pay capping' makes the tournament incentives weaker in Chinese companies compared to their western counterparts.

The other issue that needs to be pointed out is the promotion process of top managers in Chinese SOEs. Because of dominant state ownership in the Chinese stock market, the Communist Party and the Chinese government have ultimate control over board decisions including hiring, promoting and dismissing top management in Chinese listed companies controlled by the government. Therefore the contestant's output depends not only on the contestant's effort level μ and the luck component in Eriksson (1999)'s tournament model, but also on the contestant's political connection χ with the government. This suggests that the contestants do not necessarily need to increase their effort to win the contest; instead, they can build stronger political connections with the government and win the contest without putting in more effort than other contestants.

Based on the above discussions, the tournament incentives may be weaker in Chinese listed companies controlled by the government. More specifically, tournament incentives may be weaker in Chinese listed companies with higher state shareholdings. In this case, high state ownership represents strong political influences over the board of directors in Chinese listed companies.

5.3.2 Tournament hypotheses in Chinese listed companies

Rosen (1986) models internal wage schemes as sequential elimination tournaments in which managers compete against one another in a related series of tournaments. In a sequential elimination tournament, agents compete against each other at a given organizational level. On the basis of their relative performance, the winning (high-performance) agents are then promoted to the next organizational level, where they again compete against each other for further promotion, and so forth. Motivation in the tournament is provided by the possibility of further job slots in the hierarchy. The value of winning is not only the prize at that level but also includes the possibility to compete for larger prizes at higher levels. However, the option or possibility to compete in future rounds diminishes as an individual competitor moves up the organizational hierarchy. One substitute for the loss of the option to compete further is higher current compensation. Therefore, the tournament model predicts that compensation is an increasing function of organizational level (Lambert et al., 1993; Conyon et al., 2001). Eriksson (1999) investigates the relationship between executive pay and organizational levels using data based on Danish executives. He finds that there is a stable convex relationship between pay and job levels and it is relatively robust with respect to differences in how job levels are defined. Using data from 100 leading UK companies, Conyon et al. (2001)'s empirical results support the proposition that there is a convex relationship between executive compensation and hierarchical level.

Following the above propositions and by adapting the tournament model to the Chinese context, it is proposed that:

Hypothesis 2: in Chinese listed companies, the pay difference between the highest paid director and the second highest paid director is bigger than the pay difference between the second highest paid director and the third highest paid director, but the difference between the two is not big enough to be a convex relationship (H2a). Moreover, higher state ownership would further reduce the pay difference between organization levels (H2b).

O'Reilly et al. (1988) propose that as with any tournament or lottery, the size of the prize, or the difference in economic condition between the win and no-win outcomes, reflects the number of competitors. Then the greater the number of competitors, the lower the chance of winning, the larger should be the prize with other things being equal. They define the participants in this tournament as those currently serving as Vice President. In this scheme, each Vice President may give up some of the expected salary associated with his or her marginal product, or individual performance. This excess then becomes part of the lottery prize or the CEO's salary. This argument is supported by the studies of Main et al., (1993), Eriksson (1999) and Conyon et al., (2001). Eriksson (1999) finds that the larger the number of managers considered with significant responsibilities in the firm, the larger is the wage spread, which supports the prediction of tournament models that there is a positive relationship between the

number of participants and the prize of the tournament. Main et al. (1993) and Conyon et al. (2001) find support for this proposition using U.S. data and U.K. data. Following the above propositions and adapting the tournament to the Chinese context, it is hypothesized that:

Hypothesis 3: the relationship between the executive pay gap and the number of contestants is weak in Chinese listed companies (H3a) and higher state ownership would further weaken the relationship (H3b).

Tournament models have implications for the effect of wage dispersions and corporate performance (Main et al., 1993; Bloom, 1999; Eriksson, 1999). Bloom (1999) argues that a wide spread between pay levels increases the returns for higher performance, thus creating a positive pay-performance link and inducing higher future performance. However, the empirical literature has produced some mixed results on the relationship between wage dispersion and firm performance. For example, Eriksson (1999) finds that the pay dispersion has a positive effect on a performance index using a sample of Danish firms. Main et al. (1993) find a positive effect on the wage dispersion on return on assets in US firms but no effects on shareholder return. Conyon et al. (2001) find that wage dispersion does not have a robust positive effect on corporate performance using a sample of UK companies. By following the above propositions and adapting the tournament to the Chinese context, it is hypothesized that:

Hypothesis 4: corporate performance is positively related with the executive pay gap (H4a), especially in less government-controlled Chinese listed companies (H4b).

5.4 A Simultaneous Framework of Executive Compensation, Executive Ownership and Board Characteristics in Chinese Listed Companies

Mehran (1995) argues that executive compensation structure, ownership structure and board characteristics are endogenously determined and the costs and benefits of different executive compensation, ownership and board characteristics vary across firms. Agrawal and Knoeber (1996) argue that since alternative control mechanisms exist, greater use of one mechanism need not be positively related to firm performance. Where one specific mechanism is used less, others may be used more, resulting in equally good performance. The extent to which several of the control mechanisms, for examples insider shareholdings, the proportion of outside directors on the board and executive compensation, are used is decided within the firm.

Jensen and Meckling (1976) make similar arguments on the endogenesis of ownership structure, executive compensation structure and board composition. They argue that ownership structure, executive compensation structure and board composition are determined by each other and by the nature of a firm's business. These variables also influence a firm's performance. Mehran (1995) proposes that

executive compensation, ownership structure and board composition are ultimately part of a simultaneous system that determines the corporation's value and the allocation of that value among various claimants. Mak and Li (2001) also argue that the corporate governance mechanisms of a particular firm reflect the tradeoffs between costs and benefits for that particular firm. Consequently, appropriate corporate governance mechanisms vary systematically across firms.

5.4.1 Executive compensation and firm performance

Shareholders cannot directly observe the activities of management. As a result, a potential opportunity arises for managers to pursue their own interests instead of shareholders' interests. An incentive contract that relates management pay to performance may ensure that managers do promote shareholder wealth maximization. Agency theorists argue that linking compensation to the firm's stock price performance better aligns the interests of managers and shareholders, which mitigates these agency problems (Jensen and Meckling, 1976; Demsetz and Lehn, 1985). Many researchers have examined the sensitivity of a manager's wealth to changes in stock price and generally agree that pay-for-performance sensitivity is essential to effective corporate governance (Ryan and Wiggins, 2001). However, most studies have found a non-existent, extremely weak or economically miniscule relationship between pay and performance (Gregg et al., 1993; Jensen and Murphy, 1990; Main and Johnston, 1993; Firth et al., 1999). Aggarwal and Samwick (1999) argue that these studies are unable

to support the principal-agent model because the average level of the pay-performance sensitivity cannot be used to judge the validity of the principle-agent model. In most principal-agent models, the pay-performance sensitivity will decrease in the riskiness or variance of the firm's performance. Due to the disappointment with the low pay-for-performance sensitivity, Jensen and Murphy (1990) suggest that researchers should examine factors outside an agency framework to explain CEO pay. They suggest that it is important to integrate agency theory with other paradigms or to empirically test the explanatory value of alternative paradigms to agency-based models.

A number of researchers argue that executive compensation, ownership structure and board composition are endogenously determined and are ultimately part of a simultaneous system that determines the corporation's value (Jensen and Meckling, 1976; Mehran, 1995; Chung and Pruitt, 1996). Therefore, in this thesis, it is proposed that executive compensation is endogenously determined in Chinese listed companies. The research design of this study allows me to examine whether executive compensation is related to firm performance and firm corporate governance structure in a simultaneous framework.

5.4.2 Executive compensation and board characteristics

Critics of CEO compensation practices argue that because the board of directors is influenced by the CEO, the board does not structure the CEO compensation package

to maximize value for outside shareholders (Core et al, 1999). Crystal (1991) argues that boards of directors are ineffective in setting appropriate levels of compensation because outside directors are essentially hired by the CEO and can be removed by the CEO. So board members may be unwilling to take positions adversarial to the CEO, especially concerning the CEO's compensation. Core et al. (1999) argue that CEOs earn greater compensation when governance structures are less effective. An outside-director dominated board is considered to be more effective than an inside-director dominated one (Fama and Jensen, 1983; Weisbach, 1988; Core et al., 1999). Lambert et al. (1993) and Boyd (1994) find a positive relation between CEO compensation and the percentage of the board composed of outside directors.

Shareholder activists have argued for the separation of the board Chairman and CEO. It is suggested that agency problems are higher when the CEO is also the board Chairman, because duality constrains board independence and reduces the possibility that the board executive performs its governance role properly (Jensen, 1993; Yermack, 1996; Core et al., 1999; Dahya et al., 2002). Empirically, Core et al. (1999) find that CEO compensation is higher when the CEO is also the board Chairman. They suggest that firms with weaker governance structures (i.e. the CEO is also the board Chairman) have greater agency problems and CEOs at firms with greater agency problems extract greater compensation.

In the Chinese listed companies, the control power and decision rights are shared among CEO, Chairman and the Party Secretary if the company is state-controlled. It is rare that CEO, Chairman and Party Secretary are the same person in a Chinese listed company. But in most cases, Chairman and Party Secretary is the same person to avoid conflict between the Party Secretary and top managers. This Chairman/Party Secretary duality is referred to as the ‘political duality’ in Chinese companies. The decision-making power is shared among CEO, Chairman and the Party Secretary in Chinese listed companies. Therefore, like other board characteristics such as board composition and board size, political duality is also an endogenous variable in the simultaneous model.

5.4.3 Managerial ownership and firm value

Managerial ownership is a well-know solution to the principal-agent problem (Jensen and Meckling 1976; Demsetz and Lehn 1985; Jensen and Murphy 1990; Singh and Davidson III 2003). However, researchers have also found that high managerial ownership can decrease firm value because of managerial entrenchment, as external shareholders find it difficult to control the actions of such managers (DeAngelo and DeAngelo, 1985; Stulz, 1988; Morck et al. 1988). Himmelberg et al. (1999) conclude that these studies generally interpret the positive relationship at low levels of managerial ownership as evidence of incentive alignment, and the negative relation at high levels of managerial ownership as evidence that managers become

‘entrenched’ and can indulge in non-value-maximizing activities without being disciplined by shareholders. Consistent with the existence of the two countervailing effects of interest alignment and managerial entrenchment, some researchers have found a nonlinear relationship between managerial ownership and firm performance (Morck et al. 1988; McConnell and Servaes 1990; Short and Keasey 1999; Cui and Mak 2002).

A few researchers have claimed the endogenous nature of managerial ownership. Loderer and Martin (1997) argue that an unresolved question in previous studies on managerial ownership is the direction of causality. Kole (1996) also argues that managerial ownership is endogenous and that causality operates in the opposite direction, from performance to ownership. Himmelberg et al. (1999) argue that the compensation contracts observed in the data are endogenously determined by the contracting environment, which differs across firms in both observable and unobservable ways. They conclude that previous studies fail to control for unobserved firm heterogeneity that affects both ownership and performance and hence their results, subject to inconsistent estimators, are likely to be outcomes of spurious correlations. Tenev and Zhang (2002) find that the Chinese government allocates shares to a CEO based on his or her rank in the managerial hierarchy. CEO shareholding thus provides an indicator of the CEO’s standing in the company. Following the above argument, it is proposed that managerial ownership is endogenously determined in Chinese listed companies.

5.4.4 Executive compensation, managerial ownership and board of directors – a simultaneous framework

Jensen and Meckling (1976) argue that ownership structure, executive compensation structure and board composition are determined by each other and by the nature of a firm's business (e.g. business risk, nature of real assets, cash flow pattern and firm size). They suggest that these variables also influence a firm's performance. Mehran (1995) proposes that executive compensation, ownership structure and board composition are ultimately part of a simultaneous system that determines the corporation's value and the allocation of that value among various claimants. Mak and Li (2001) also argue that the corporate governance mechanisms of a particular firm reflect the tradeoffs between costs and benefits for that particular firm. Consequently, appropriate corporate governance mechanisms vary systematically across firms.

As Mehran (1995) suggests, shareholders do not set executive compensation, they elect directors, who have the exclusive right under corporate law to manage the corporation. Among the most important of directors' tasks is to set the level and structure of executive compensation. This raises the issue of how the composition of the board affects the structure of executive compensation. Critics of CEO compensation practices argue that because the boards of directors are influenced by the CEO, the board does not structure the CEO's compensation package to maximize value for outside shareholders (Core et al., 1999). Crystal (1991) argues that boards of

directors are ineffective in setting appropriate levels of compensation because outside directors are essentially hired by the CEO and can be removed by the CEO. Therefore board members may not want to take positions opposite to the CEO, especially in relation to the CEO's compensation. Moreover, the board usually relies on the compensation consultants hired by the CEO, and this may lead to compensation contracts that are optimal for the CEO, but not for the firm.

Following the above arguments, an integrated investigation of the factors affecting executive compensation, managerial ownership, board characteristics and firm performance will be presented by explicitly incorporating the simultaneity of the process determining these variables into an empirical estimation. Therefore,

Hypothesis 5: Executive compensation, managerial ownership, board characteristics and firm value are jointly determined in Chinese listed companies.

5.5 Conclusion

In this chapter, 5 hypotheses on executive compensation in Chinese listed companies are developed by following three theoretical models: the managerial power model, tournament model and simultaneous model. The empirical evidence of the 5 hypotheses is very limited, even in Western countries. This thesis is the first study to examine the three perspectives on executive compensation in the Chinese context.

China is the largest transitional economy in the world with a special institutional background and social environment. As previously established empirical finds on these hypotheses may not be universally valid, it is very valuable to test whether these hypotheses do operate in the Chinese context.

All three models have been modified and adapted to the special Chinese context. In the managerial power model, a new power dimension - political power - has been added to the model, together with a new explanation of the executive ownership as structural power in Chinese listed companies. In the tournament model, the non-cash reward—political promotion for top managers and the political influences over the tournament model are addressed. The tournament model has been adapted to the special Chinese institutional background. In the simultaneous model, a new board characteristics—political duality was introduced to the model to reflect the political influence over executive compensation and the board of directors in Chinese listed companies.

Chapter 6 Research Methodology

6.1 Introduction

The purpose of this study is to examine the determinants of executive compensation in Chinese listed companies. In the previous chapter, 5 hypotheses on executive compensation in Chinese listed companies have been developed from three theoretical models: the managerial power model, tournament model and simultaneous model. All the hypotheses have been evaluated in and adapted to the special Chinese context.

In this study, quantitative methods are used to test the five hypotheses developed in chapter 5. This chapter discusses the research methodology, research models, sample and data collection, the measurement of variables and data analysis techniques employed. The remainder of the chapter is organized as follows: Section 2 discusses the research methodology, methodological concerns and limitations of previous studies. Section 3 outlines the sample selection process and data collection. Section 4 discusses the measurement of the variables used in the study. Section 5 presents the quantitative method employed for the data analysis. The chapter ends with a brief summary and concluding remarks.

6.2 Research Models

The 5 hypotheses are tested in cross-sectional regression models. Hypothesis 1 relates to the managerial power—compensation model in Chinese listed companies. Hypotheses 2-4 relate to the tournament model on executive compensation in Chinese listed companies. Hypothesis 5 relates to the simultaneous model on executive compensation, executive ownership and board characteristics in Chinese listed companies. The models used to test these hypotheses are discussed below.

6.2.1 Managerial power model

The relationship between managerial power and executive compensation in Chinese listed companies is examined in hypothesis 1. It states that the level of executive compensation is positively related to the level of executive power in Chinese listed companies. Two power dimensions are used to represent the managerial power in Chinese listed companies. Political duality is used to represent the political power and executive ownership is used to represent the structural power in Chinese listed companies. The regression equation takes the following form:

$$W = \beta_0 + \beta_1 OWN + \beta_2 PARTY + control + \varepsilon \quad (1)$$

where W = executive compensation in Chinese listed companies;

OWN = the percentage of outstanding shares owned by the executive directors;

PARTY = 1 if the director is the Party Secretary, 0 otherwise.

control = control variables;

ε = equation error.

6.2.2 Tournament model

The tournament research hypotheses (Hypotheses 2-4) are tested using both OLS regression and panel data regression. Hypothesis 2 tests whether there is a convex relationship between executive compensation and organization level in Chinese listed companies. Following Lambert et al. (1993) and Conyon et al. (2001)'s work, the basic regression equation is as follows:

$$\text{Log}(W) = \beta_0 + \beta_1 \text{level1} + \beta_2 \text{level2} + \text{control} + \varepsilon \quad (2)$$

where W = executive compensation in Chinese listed companies;

level1 = 1 if the executive director is the highest paid director and zero otherwise,

level2 = 1 if the executive director is the second highest paid director and zero otherwise;

control = control variables;

ε = equation error.

In addition to the shape of the pay-job level relationship, there are two other key predictions of the tournament model, namely, that the prize for winning increases with the number of contestants, and that a wider pay dispersion increases the economic performance of firms (Eriksson, 1999).

Hypothesis 3 tests whether the pay differences between job levels of executive directors increase with the number of competitors in Chinese listed companies. Following Main et al. (1993), Eriksson (1999) and Conyon et al. (2001), the basic regression equation is as follows:

$$\text{Log}(W_1) - \text{Log}(W_A) = \beta_0 + \beta_1(\text{Con}) + \text{control} + \varepsilon \quad (3)$$

where W_1 = cash compensation of the highest paid director in Chinese listed companies;

W_A = the average cash compensation received by the second and the third highest paid director in Chinese listed companies;

Con = number of executive directors in Chinese listed companies which represents the number of contestants;

control = control variables;

ε = equation error.

Hypothesis 3 tests the relationship between wage dispersion and corporate performance in Chinese listed companies. According to Main et al. (1993), Eriksson (1999) and Conyon et al. (2001), the regression equation is as follows:

$$P = \beta_0 + \beta_1(Pay_D) + control + \varepsilon \quad (4)$$

where P = firm performance of Chinese listed companies;

Pay_D = the cash compensation differences between the highest paid director and the contestants;

control = control variables;

ε = equation error.

6.2.3 The simultaneous model of executive compensation, managerial ownership, board characteristics and firm performance

The simultaneous model hypothesis states that executive compensation, managerial ownership and board characteristics are jointly determined in Chinese listed companies and are ultimately part of a simultaneous system that determines the value of Chinese listed companies.

6.2.3.1 Executive compensation model

There is a variety of different model specifications in the empirical literature on

executive compensation. One seeks to explain the level of pay and the other seeks to explain changes in pay. This study focuses on the determinants of executive compensation, therefore the focus is on the level of pay. To test the relation between executive compensation and performance, the regression model (5) is employed. Model (5) is used to test the relationship between executive compensation and firm performance after controlling for firm size, ownership structure, board characteristics, manager specific characteristics, industry, years of IPO and location of the company.

$$\text{Executive compensation} = f(\text{firm performance, managerial ownership, board characteristics, manager characteristics, firm size and other control variables}) \quad (5)$$

Moreover, since the logarithmic transformed model tests the robustness of the results, the advantage of this specification is that the regression coefficients on the board and ownership structure variables measure the proportionate effects of a variable on compensation, rather than the dollar value effect (Core et al., 1999). Equation (5) is used for evaluating the executive pay level and logarithmic executive pay in the simultaneous model to test hypothesis 5.

6.2.3.2 Firm performance and the managerial ownership model

Short and Keasey (1999) estimate a cubic form of the relationship between the firm performance and managerial ownership based on previous empirical results. The

model is as follows:

$$P = \alpha + \beta_1 OWN + \beta_2 OWN^2 + \beta_3 OWN^3 + \gamma \text{ Control Variables} \quad (6)$$

where P is defined as the performance measure; OWN is defined as the percentage of equity shares held by executive directors. Three variables are included in the model: OWN (the percentage of shares owned by executive directors), OWN^2 and OWN^3 (the square and cube, respectively, of the percentage of shares owned by executive directors). This is a general extension of Morck et al.'s (1988) piecewise model, allowing the coefficients on the managerial ownership variables to determine their own turning points. The coefficient on the variables OWN and OWN^3 is expected to be positive (indicating the alignment of interest with its positive effect on firm performance at lower and higher levels of executive ownership), while that on the variable OWN^2 is expected to be negative (indicating entrenchment with negative effects on the performance of firms at medium levels of ownership) (Short and Keasey, 1999). The value of the firm's managerial talents and intangible assets can be proxied by the ratio of the firm's market value to the replacement cost of its assets. This ratio is known as Tobin's Q . The calculation of Tobin's is presented in section 6.4.4.

Equation (5) and (6) are both employed to test Hypothesis 5.

A complete hypothesis list is presented in Appendix 1.

6.3 Sample Selection

Many studies (Chen, 2006, Kato and Long, 2008) on executive compensation in Chinese listed companies use the Sinofin data base. However, Sinofin only discloses the aggregate compensation of the top 3 highest paid directors rather than the individual director's compensation, which could lead to biased results when testing compensation models such as the tournament model and simultaneous model.

In order to test the five research hypotheses, there are a few requirements for the compensation data used in this study. First, the individual compensation of the CEO (or the highest paid director) is needed to test the managerial power model and simultaneous model. Second, the individual director's compensation for the top 3 highest paid directors is needed to test the tournament model. Third, to control unobserved firm heterogeneity, panel data is needed in this study.

To fulfill the three requirements, executive cash compensation data and executive shareholdings are collected from annual reports of Chinese listed companies. I manually collected each of the top 3 highest paid executive directors' cash compensation, director shareholdings, age, tenure and political duality. All variables were coded and checked to avoid the least error. Executive compensation data for Chinese listed companies is not available before 1998. In 1998, the China Securities Regulation Committee (CSRC) required public-listed companies to disclose the

compensation for individual directors on the board. Most public-listed companies in China disclosed their directors' remuneration in 1998. However, many listed companies did not follow the compensation disclosure guidelines after 1998 and the number of public-listed companies which disclosed their directors' remuneration for individual directors decreased rapidly year by year. Table 6.1 summarizes the sample selection procedures starting with 807 listed companies in 1998. In 2001, the number of companies with continuous disclosure of individual directors' compensation, managerial ownership and manager characteristics since 1998 reduces to 71.

The following criteria were used in selecting the Chinese companies for this study:

1. The companies must be listed on the Shanghai Stock Exchange or Shenzhen Stock Exchange at the end of 1997 because in 1998, the China Securities Regulation Committee (CSRC) required public-listed companies to disclose the compensation for individual directors on the board in 1998.
2. The companies must have been listed on the Shanghai Stock Exchange or Shenzhen Stock Exchange for at least 4 years by the end of 2001.
3. Individual directors' remuneration is disclosed continuously in the annual reports from 1998 to 2001.

4. The company must not be from the financial service industry (as financial institutions have very different company characteristics to other companies).
5. The company must be listed on the A-share stock market. There are 3 types of publicly-traded shares in China: A-shares, B-shares and H-shares. A-shares are similar to ordinary equity shares as generally accepted in other equity markets, except that they are exclusively available to Chinese citizens and domestic institutions. B-shares are issued to attract foreign portfolio investors. Since the Chinese currency is not convertible on the capital account, B-shares are quoted and traded in either US dollars (on the Shanghai Stock Exchange) or Hong Kong dollars (on the Shenzhen Stock Exchange). B-shares can only be subscribed for, owned by and traded amongst foreigners and people from Hong Kong, Macao and Taiwan. On average, B-shares account for less than 5% of the total shares of a company. H-shares are shares of mainland Chinese enterprises listed on the Hong Kong Stock Exchange. The H-shares represent a small percentage (less than 5% in 2000) of the total shares of Chinese listed firms (Sun et al., 2002). As B-shares and H-shares only account for a small percentage of the total shares of Chinese listed firms, I have only included companies listed on the A-shares stock market.

In summary, the data is drawn from a sample of Chinese listed companies which includes cash compensation, executive shareholdings, age, gender and tenure of each

of the top 3 highest paid directors. The financial data of Chinese listed companies is from the Sinofin database. The sample includes 71 Chinese listed companies with continuous full disclosure of individual directors' remuneration from 1998 to 2001. The research sample of this study is unique in two ways. First, this sample contains the individual director's compensation for the top 3 highest paid directors, whereas in other studies (Chen, 2006; Kato and Long, 2008), only the aggregate compensation of the top 3 highest paid directors is used. Second, this sample is panel data with continuous individual directors' compensation data from 1998 to 2001, whereas other studies (Firth et al., 2006; Li et al., 2007) on Chinese executive compensation only use a non-panel dataset.

Table 6.1 Summary of sample selection process

Summary of sample selection process	Shanghai Stock Exchange	Shenzhen Stock Exchange	Total No. of listed companies
Total Chinese listed companies which 1. are listed on A share stock market; 2. are not financial institutions; 3. disclose individual directors' cash compensation in 1998.	422	385	807
Total Chinese listed companies which 1. are listed on A share stock market; 2. disclose individual directors' cash compensation in 1998 and 1999.	140	216	356
Total Chinese listed companies which 1. are listed on A share stock market; 2. disclose individual directors' cash compensation in 1998, 1999 and 2000.	82	153	235
Total Chinese listed companies which 1. are listed on A share stock market; 2. disclose individual directors' cash compensation in 1998, 1999, 2000 and 2001.	21	50	71

6.4 Data Description and Measurement

6.4.1 Compensation variables

Lambert et al.'s (1993) compensation data includes both cash compensation and total compensation. Cash compensation consists of base salary and annual bonus. Total compensation is the sum of salary, annual bonus, stock options, performance plans, phantom stock and restricted stock. In Core et al.'s (1999) study, CEO compensation is based on three different measures of compensation: total compensation, cash compensation and salary. The former two compensation measures are the same as that in Lambert et al.'s (1993) study, whereas salary simply measures the component of compensation that is fixed at the beginning of the year. Total cash compensation is the measure used by most studies of CEO compensation. Ezzamel and Watson (2002) use cash payments (salary plus bonuses) of the highest paid executive and the average amount of cash payments of the other board members. They argue that current period option awards are likely to be noisy indicators of performance-related pay and more likely to depend upon factors such as how many unexercised options the executive holds (and/or has exercised recently), and whether there are other ways of aligning incentives. Moreover, serious measurement and information problems have proved to be a major inhibition to research which attempts to specify the timing of generating income from the non-cash benefits/perquisites received by executives.

The Chinese listed companies only disclose their cash compensation in the annual reports. Individual directors' total cash compensation is not broken down into salary, bonus and allowance. In this study, the level of executive pay takes the form of: cash compensation of each of the highest, 2nd highest and 3rd highest paid director.

6.4.2 Managerial ownership variables

Morck et al. (1988) define managerial ownership as shares owned by directors and their immediate families at the accounting year end. McConnell and Servaes (1990) define management (or 'insider') ownership as equity owned by corporate officers and members of the board of directors. Short and Keasey (1999) measure managerial ownership as the percentage of equity shares owned by directors and their immediate families at the accounting year end. Himmelberg et al. (1999) measure managerial ownership as the percentage of the firm's shares owned by the top managers and directors.

The ownership data in the annual reports of Chinese listed companies is available for individual directors on the board and top managers of the firm. In this study, executive ownership in China takes the form of the percentage of shares held by each of the highest, 2nd highest and 3rd highest paid director.

6.4.3 Board structure variables

6.4.3.1 Board composition

Daily et al. (1999) argue that over two dozen operationalizations of board composition can be identified from the empirical literature. A review of the governance literature relying on board composition as a variable reflects several categories: the proportions of inside/outside directors (or executive/non-executive directors), independent/interdependent directors and affiliated directors.

Insiders or executives are defined as directors who are also members of a firm's management. Outside or non-executive directors are classified as all non-management members of the board (Boyd, 1994). Conyon and Peck (1998) measure board composition as the proportion of directors who were not executives of a company on its main board. Recently, this traditional inside/outside (executive/non-executive) director distinction has been questioned for its ability to capture the independence of the outside directors. As a result, some studies further classified directors into insiders, affiliated directors and independent directors (Daily and Dalton, 1994). Following the literature of labeling directors, Denis and Sarin (1999) define insider or executive as those who are current employees of the firm. Affiliated directors are defined as those who have substantial business relations with the firms, who are related to insiders and who are former employees. Independent outsiders are defined as those who are neither insiders nor affiliated outsiders.

This classification is also adopted in China but with some modifications to fit with the special corporatization process of Chinese SOEs. Affiliated directors, according to Tian and Lau (2001), are those directors who represent the sponsor enterprise of the shareholding company. By contrast, independent directors are directors who are not currently employed by the focal shareholding company and its affiliated companies (including its sponsor enterprise and its wholly-owned subsidiaries). Independent directors have no operational relationship with the company other than their seat on the board. Tian and Lau (2001) argue that the distinction between independent and affiliated directors is meaningful because these two measures highlight the differences among directors in terms of their motivation, firm-specific knowledge, information advantage and interpersonal relationship with the top managers.

The securities and Exchange Commission (SEC) also provide specific guidance for determining directors' independence. Directors meeting any of the following criteria are referred to as 'affiliated directors' and are considered to be characterized by a lack of independence:

1. Employment by the firm or an affiliate within the past five years
2. Family relationship by blood or marriage with a top manager or other director
3. Affiliation with the firm as a supplier, banker or creditor within the past two years

4. Affiliation with the firm as an investment banker within the past two years or within the upcoming year
5. Association with a law firm engaged by the corporation, and
6. Stock ownership resulting in the SEC designation of control person.

Fung et al.(2003) point out that there is one technical difficulty in differentiating executive and non-executive directors in Chinese listed companies because most Chinese companies do not disclose such information. When studying Chinese listed companies, one common practice is to treat unpaid directors as non-executive directors. In this study, non-executive directors are proxied by the unpaid (or allowance-paid only) directors who do not hold management positions in the company. Directors who are non-executive and are not independent are coded as affiliated directors. Therefore, the definitions of board composition in this thesis are as follows:

1. Executive/inside directors: directors who are directly involved in day-to-day management of the shareholding company.
2. Affiliated directors: directors who represent the state or legal person (institutional) shareholders; and directors who provide financial, legal or consulting services to the listed company or its subsidiaries.
3. Independent directors: directors who are not as stated above.

6.4.3.2 Board leadership structure

There are two measurements of board duality in Chinese listed companies in this study. Following previous work, the first measurement of duality is when the CEO also serves as Chairman of the board (Finkelstein and D'Aveni, 1994; Boyd, 1995). The second measurement of duality is political duality, which represents the Chairman/Party Secretary duality in Chinese listed companies. Political duality equals 1 if Chairman also serves as the Party secretary, 0 otherwise.

6.4.3.3 Board size

According to Yermack (1996) study, board size is coded as the number of members of the board of directors on the annual meeting date during each fiscal year.

6.4.4 Performance measures

Extensive literature documents the relation between cash compensation and both stock returns and accounting earnings. Sloan (1993) argues that earnings-based incentives shield managers from market-wide risk that is out of managers' control. Leone et al. (2006) argue that management compensation contracts use accounting earnings not just to filter out risk, but also because conservative earnings (unlike returns) filter out unrealized gains (like returns) which include unrealized losses. CEO

salary levels, being determined by a competitive market for CEOs, are likely to be related to firm performance as measured by stock returns.

Firm performance is measured by the accounting return on assets, the annual stock market return and Tobin's Q on the common stock in many previous studies on executive compensation (Mehran, 1995; Yermack, 1996; Benito and Conyon, 1999; Core et al., 1999). Mehran (1995) uses two proxies for firm performance: 1. Tobin's Q, measured by the ratio of the market value of the firm's securities to the replacement cost of its tangible assets, and 2. return on assets (ROA), measured by the ratio of net income to the book value of the firm's total assets. Mehran (1995) argues that stock return as a proxy for firm performance is most appropriate for all-equity firms. Whether Q and ROA are correct proxies for firm performance is a subject of continuing debate in the literature. Many have argued that Q is a better proxy for the firm's growth opportunity than its performance. In addition to well-known measurement problems associated with Q, many have argued that Q is a better proxy for the firm's growth opportunity than its performance. Others argue that ROA and other accounting rates of return convey little information about economic rates of return (e.g. Fisher and McGowan, 1983), while Jensen and Murphy (1990) and Core et al (1999) argue that accounting returns are highly important in determining executive compensation. Although the three proxies (Tobin's Q, ROA, and Stock return) have their own shortcomings, they are highly correlated (Jacobson, 1987), and the qualitative nature of the results should not be affected by the choice of the proxy

(Mehran, 1995). Therefore, according to previous literature, three performance measures are used in this study:

1. ROA (return on assets). ROA is measured by the ratio of net income to the book value of the firm's total assets.
2. Stock Return (earnings per share)
3. Tobin's Q. Tobin's Q = (market value of firm)/(replacement cost of assets)

Tobin's Q is widely used as a measure of firm performance by many previous studies (Chung and Pruitt, 1994; Lang and Stulz, 1994; Yermack, 1996; Himmelberg et al., 1999). Tobin's Q is the ratio of the value of the firm divided by the replacement value of assets. Himmelberg et al. (1999) measure the market value of the firm by the total of the market value of common equity plus the estimated market value of preferred stock (roughly estimated as ten times the preferred dividend) plus the book value of total liabilities. The replacement value of assets is measured by the book value of total assets. Their definition is closely related to the market-to-book ratio, which is calculated by subtracting total liabilities from both the numerator and denominator.

According to Chung and Pruitt (1994) and Himmelberg et al. (1999), the simple approximation of Tobin's Q is calculated by:

$$Q = \frac{MVE + PS + DEBT}{TA}$$

where MVE = market value of equity (the product of a firm's share price and the number of outstanding ordinary shares).

PS = liquidating value of the firm's outstanding preferred shares

DEBT = total liability of the firm's outstanding preferred shares

TA = book value of total assets.

6.4.5 Control variables

Firm size

Ezzamel and Watson (2002) argue that firm size proxies for a number of supply and demand relevant factors and empirically has a strongly positive relationship with pay levels. Many researchers use sales to proxy for firm size and complexity (Core et al., 1999; Ezzamel and Watson, 2002). Some researchers use the log of the book value of assets as a proxy for firm size (Mehran, 1995; Tian and Lau, 2001; Firth et al., 2006). Following the previous studies, I have used two proxies for firm size:

1. Firm sales as the proxy for firm size and complexity;
2. Log of the book value of total assets.

Ownership structure

Government ownership and institutional ownership

A typical listed company in China has a mixed ownership structure with three predominant groups of shareholders—the state, legal persons (institutions), and individuals and private institutions. Each holds approximately 30% of the stock (Xu and Wang, 1999). State shares have been created in China to designate holdings in state-owned enterprises by central government, local governments or solely government-owned enterprises. In China, legal entities are often under ultimate control of the state although they enjoy some autonomy in their actions. Legal person shares are shares owned by domestic institutions which are themselves partially owned by central or local government. Legal persons are typically business agencies or enterprises of local governments that helped in starting up the public company, either by giving permission to operate or by allowing public resources to be used for the start-up. Sun et al. (2002) argue that legal persons are likely to behave similarly as state shareholders (Sun et al., 2002) and they use both state share ownership and legal person ownership as the proxy for government ownership.

According to previous literature, the following ownerships are used to represent government ownership:

- State ownership: the percentage of outstanding shares held by the government in Chinese listed companies;
- Institutional ownership/Legal entity: the percentage of outstanding shares held by institutional shareholders/legal persons in Chinese listed companies.

Foreign ownership

The Chinese government authorities allow some firms to issue shares to foreigners, although the percentage of foreign shares is decided by the state. Firth et al. (2006) believe that foreign investors want firms to maximize profits and stock market value. Empirically, they find a positive relationship with foreign ownership and firm performance in Chinese firms and firms with foreign shareholders also have incentive pay schemes.

Therefore, following previous literature, foreign ownership is included in the compensation models.

- Foreign ownership: the percentage of outstanding shares held by foreign shareholders in Chinese listed companies.

Manager-specific characteristics

CEO tenure can be viewed as a proxy for a CEO's influence over the board. Hill and Phan (1991) argue that over time, CEOs can circumvent monitoring and incentive alignment mechanisms and strengthen their positions vis-à-vis those of stockholders. Thus, the relationship between pay and stock returns predicted by agency theory breaks down as CEO tenure increases. Empirical results are consistent with Hill and Phan's argument, suggesting that the relationship between CEO pay and stock returns weakens with tenure. In Ryan Jr. and Wiggins III (2001)'s study of CEO compensation, they also control for the CEO's tenure, defined as the number of years he has worked as CEO. They argue that on the one hand, CEOs with long tenures are more likely to be entrenched and thus capable of pursuing personal agendas. On the other hand, a CEO may owe his tenure to the fact that he creates shareholder value or he may have large stock ownership from previous grants. Thus they do not predict any specific relation with incentive compensation structure.

Yermack (1996) and Ryan Jr. and Wiggins III (2001) use the CEO's age to proxy for the 'CEO horizon problem'. They argue that agency conflict occurs when the manager's horizon is shorter than the firm's investment horizon. An older manager might be near retirement while a younger manager might want to build his reputation to enhance his value in the labour market. Both of these managers have the incentive to focus on projects that will pay off in the short-term. Consistent with their premise,

Ryan Jr. and Wiggins III (2001) find a concave relation between cash bonus and age. This finding suggests that firms tend to pay smaller cash bonuses to both the youngest and the oldest managers.

In this study, the following control variables are used in compensation models:

- Age: age of the highest/2nd/3rd highest paid director
- Gender: the gender of highest/2nd/3rd highest paid director
- Tenure: number of years served by the highest, 2nd highest and 3rd highest paid director in their current position since the company was listed on the stock exchange.

Other control variables

Other control factors including the location of the business and industry classification are introduced into the executive compensation model to account for regional and industry differences.

As living expenses and pay levels vary significantly across areas, the average pay level in big cosmopolitan cities like Beijing, Shanghai and the South-east coastal cities is much higher than in inland areas. Therefore, CEO salaries are likely to be influenced by the location of the companies.

- Location: the location of the Chinese listed company equals 1 if it is located in more developed areas in China (Beijing, Shanghai or South-east coastal cities); 0 otherwise.

To capture the variation of CEO compensation across industries, Firth et al. (2006) use industry dummy variables to capture the different industries of the corporations. The industry classifications of Chinese listed companies regulated by the China Securities Regulatory Commission are:

- A. Agriculture, forestry and fishing;
- B. Mining and quarrying;
- C. Manufacturing;
- D. Electricity, gas and water supply;
- E. Construction;
- F. Transport and storage;
- G. Information technology;
- H. Wholesale and retail trade;
- I. Financial intermediation;
- J. Real estate;
- K. Social service;
- L. Culture and communication;
- M. Syntheses.

Chung and Pruitt (1996) propose that various CEO and firm characteristics may be different among firms with different firm ages. For instance, the firm's growth potential, size, CEO age, probability of a founder-CEO and experience variables may systematically vary according to the age of the firm. In order to control for such factors, they use firm age (proxied by the date of first stock listing as reported in the CRSP data tape) as an explanatory variable for CEO compensation, CEO ownership and market value of the firm. Therefore, the year of IPO is used as the proxy of company age in compensation models.

- Year of IPO: the number of years since the initial public offering of the Chinese listed company.

A complete list of the definitions of variables is presented in Appendix 2.

6.5 Research Methods

Three regression methods are employed in this study: Ordinary Least Squares (OLS), Panel data techniques and Three-stage Least Squares (3SLS). Results from different methods will be compared and discussed.

Primarily, hypotheses 1-4 are tested cross-sectionally by using ordinary least-squares (OLS) analysis. To estimate the population regression function on the

basis of the sample regression function as accurately as possible, there are several methods of constructing the sample regression function, but insofar as regression analysis is concerned, the method that is used most extensively is the method of Ordinary Least Squares (OLS), which is attributed to Carl Friedrich Gauss, a German mathematician. The least-squares approach to regression analysis has been shown to be optimal in the sense that it satisfies the Gauss-Markov Theorem⁵(Gujarati, 1995).

There are a number of assumptions underlying the Ordinary Least Squares (OLS) method, for example, homoscedasticity or equal variance of the disturbances, no specification error etc. In real cases, relaxing these assumptions could cause problem of heteroscedasticity and specification error (omitting relevant variables or inclusion of irrelevant variables and so forth (Gujarati, 1995). There are a few methods that can detect the problem of heteroscedasticity, for example, White's general heteroscedasticity test does not rely on the normality assumption and is easy to implement. The White test can be a test of heteroscedasticity or specification error or both (White, 1980). Heteroscedasticity can arise as a result of the presence of outliers. An outlying observation, or outlier, is an observation that is very different (either very small or very large) in relation to the other observation, especially if the sample size is small and this can substantially alter the results of regression analysis. Deleting possible outliers can eliminate the problem. Another source of heteroscedasticity arises from specification error. It is very often that what looks like heteroscedasticity

⁵ Gauss-Markov Theorem: Given the assumptions of the classical linear regression model, the least-squares estimators, in the class of unbiased linear estimators, have minimum variance, that is, they are the best linear unbiased estimators (Gujarati, 1995).

may be due to the fact that some important variables are omitted from the model. The problem may be solved by using first-difference form, the form excluding the confounding influence of unobservable firm and executive fixed effects on the estimated parameters (Conyon et al., 1995; Ezzamel and Watson, 1998).

In addition, the correlation of error term is going to be tested to detect the possible omitted variables. Since the data in this study includes the same companies over time, the OLS standard errors could be affected by a lack of independence. Petersen (2009) argues that when using panel data, the residuals may be correlated across firms or across time so that OLS standard errors can be non-independent, therefore biased. Many methods were used in the past to solve this problem. According to Petersen's (2009) research, in corporate finance applications, the importance of the time effect is small after including time dummies. In the presence of a firm effect, the standard errors clustered by firm are unbiased and produce correctly-sized confidence intervals whether the firm effect is permanent or temporary. In addition, the fixed effect and random effects models also produce unbiased standard errors but only when the firm effect is permanent. Therefore, to solve the problem of possible biased OLS standard errors, the following methods were used. First, year dummies were included in the regression analysis to control the time effect. Second, robust regression was employed with standard errors clustered by firm to control the firm effect. Third, panel data regression techniques (fixed effect or random effect model) were used to produce unbiased standard errors.

Panel data refers to the pooling of observations on a cross-section of households, countries, firms and so forth, over several time periods. Baltagi (1995) summarizes some of the benefits of panel data analysis:

1. Controlling for individual heterogeneity. Panel data suggests that individuals, firms, states or countries are heterogeneous. Time-series and cross-section studies not controlling for this heterogeneity run the risk of obtaining biased results.
2. Panel data gives more informative data, more variability, less collinearity among the variables, more degrees of freedom and more efficiency.
3. Panel data is better able to study the dynamics of adjustment.
4. Panel data is better able to identify and measure effects that are simply not detectable in pure cross-section or pure time-series data.
5. Panel data models allow us to construct and test more complicated behavioral models than purely cross-section or time-series data.
6. Panel data is usually gathered on micro units, like individuals, firms and households.

Conyon and Peck (1998) employ a panel data analysis of top management compensation. They argue that using panel data methodology allows them to reduce the problem of omitted (i.e. mis-measured or not observed) variables. Specifically, this estimating procedure allows them to control for company characteristics that

affect top management compensation but were not observed. This is achieved by the inclusion of company-specific dummy variables.

Besides the statistical tests discussed earlier, the issue of endogeneity all the models will be examined. Larcker et al. (2008) argue that the endogeneity induces a correlation between the explanatory variable and the true (but unobserved) error term in the structural model, which violates the OLS assumptions and leads to biased estimation. Although a fixed-effects model can mitigate the endogeneity problem, it cannot solve the problem. Instrumental variables methods are widely used in economics, accounting and finance to deal with problems of endogeneity and measurement error. To address the possible problem of endogeneity, a two-stage least-square (2SLS) method will be used to check the problem of endogeneity and whether the OLS or panel data estimates are consistent and unbiased. However, there are limitations of the instrumental variables method. Larcker et al. (2008) argue that the standard textbook solution to endogeneity is appropriate if the research can find instrumental variables that are correlated with the endogenous regressor but uncorrelated with the error in the structural equation. However, it is almost impossible to find such a variable. Moreover, Larcker et al. (2008) show that when the instrument is only weakly correlated with the regressor, IV methods produce highly biased estimates when the IV is even slightly endogenous. In those cases, it is likely that IV estimates are more biased and more likely to provide the wrong statistical inference than simple OLS estimates that make no correction for endogeneity. In summary,

there are costs and benefits to various ‘solutions’ to the problem of endogeneity.

Finally, to capture the simultaneous nature of the relationship among executive compensation, executive ownership, board characteristics and firm performance, a three-stage least squares (3SLS) regression is employed to estimate the simultaneous model. By contrast, the two-stage least squares method consists of two steps. The first step serves to estimate the moment matrix of the reduced-form disturbances and the second step serves to estimate the coefficients of one single structural equation after its jointly dependent variables are ‘purified’ by means of the moment matrix. The three-stage least squares (3SLS) method goes one step further by using the two-stage least squares estimated moment matrix of the structural disturbances to estimate all coefficients of the entire system simultaneously (Zellner and Theil, 1962). Belsley (1988) argues that the three-stage least squares approach can be more efficient than the two-stage least squares approach, a relative advantage that increases with the strength of the interrelations among the error terms.

In the simultaneous equation system, the endogenous variables are identified by their endogenous nature in a Chinese listed company: 1. executive compensation (hpdttot); 2. executive ownership (hpdown); 3. board size (board); 4. board composition (perindp); 5. firm value (Tobin’s Q); 6. CEO/Chair duality; 7. political duality (Chairman/Party Secretary duality). There are 16 instrumental or exogenous variables: age, agesq, tenure, tensq, perned (percentage of non-executive directors), duality

(CEO/Chair duality), party (Chair/Party Secretary duality), sales/assets(firm size), stateown, legalown, foreignown, location, yripo(company age), gender, sdev (firm risk), roa/eps and debt (leverage ratio). Hypothesis 5 is examined by using the following simultaneous model:

$$(1) \text{Hpdtot} = f(\text{hpdown}, \text{perindp}, \text{board}, \text{duality}, \text{party}, \text{age}, \text{agesq}, \text{tenure}, \text{tensq}, \text{gender}, \text{lgasset}, \text{stateown}, \text{legalown}, \text{foreignown}, \text{location});$$

$$(2) \text{Hpdown} = f(\text{Tobin's Q}, \text{perindp}, \text{board}, \text{duality}, \text{party}, \text{age}, \text{agesq}, \text{tenure}, \text{tensq}, \text{lgasset}, \text{stateown}, \text{legalown}, \text{foreignown}, \text{yripo}, \text{sdev});$$

$$(3) \text{Perindp} = f(\text{hpdown}, \text{board}, \text{duality}, \text{party}, \text{stateown}, \text{legalown}, \text{foreignown}, \text{yripo});$$

$$(4) \text{Board} = f(\text{hpdown}, \text{perindp}, \text{duality}, \text{party}, \text{lgasset}, \text{stateown}, \text{legalown}, \text{foreignown}, \text{yripo});$$

$$(5) \text{Tobin's Q} = f(\text{hpdtot}, \text{hpdown}, \text{perindp}, \text{board}, \text{duality}, \text{party}, \text{stateown}, \text{legalown}, \text{foreignown}, \text{yripo}, \text{sdev}, \text{debt}).$$

According to Gujarati (1995) and Greene (2003), the order and rank conditions are checked to make sure that Formulas (1)-(5) are identified. The sensitivity of the simultaneous model to the changing of the exogenous variables will also be examined.

6.6 Conclusion

In this chapter, research models, data collection, the measurement of variables and quantitative methods employed are discussed. The data sample used in this study is the most complete panel data sample with individual directors' compensation, executive ownership, board structure and firm- and manager-specific characteristics of Chinese listed companies in the period from 1998 to 2001.

Tian and Lau (2001) argue that previous studies have mostly focused on the static structure of the board of directors, with little attention given to the time-dependent nature of the corporate governance system in transition economies. Longitudinal research is needed to examine the changing patterns of corporate governance and their impact on organizational performance. In the following chapters of data analysis, Ordinary Least Squares (OLS) will be employed to test the static relationship between executive compensation, executive ownership, board characteristics and firm performance (Hypotheses 1-4). Furthermore, panel data techniques will be used to test the same hypotheses again to take into account the time-dependent nature of compensation, ownership, board-of-directors structure and firm performance. Panel data techniques can control individual heterogeneity, reduce the problem of omitted variables and control firm-specific characteristics (Baltagi, 1995; Conyon and Peck, 1998). Finally, three-stage least squares (3SLS) will be employed to test the simultaneous nature of executive compensation, board characteristics and firm value.

Chapter 7 Preliminary Analysis

7.1 Introduction

The data sample was drawn from the listed companies in the Shanghai and Shenzhen Stock Exchanges. All the companies had fully disclosed individual directors' cash compensation, executive ownership, director characteristics and board characteristics from 1998 to 2001. The data was coded manually by the author. The financial data was extracted from the SINOFIN CCER Chinese Securities Market Database System. The sample of Chinese listed companies includes 284 firm/year observations for 71 companies over 4 years. It contains information on 779 executive directors between 1998 and 2001.

Before analyzing the data, data screening and cleaning were done to keep the data set free from errors. The minimum and maximum values and means of the variables were checked to see if they were within the range of possible values on the variable. The valid and missing cases were also checked for errors when entering the data.

In this chapter, the variable characteristics and correlation analysis in the sample are presented. Any violations of the assumptions underlying the statistical/econometrical techniques used were also checked. The rest of the chapter is

organized as follows: section 2 presents the descriptive statistics of the key variables. Section 3 presents the correlation analysis of the key variables used in the empirical analyses. Section 4 is the conclusion.

7.2 Descriptive Statistics

Descriptive statistics were conducted firstly to help understand the nature of the key variables before conducting further data analysis. The variables were categorized into 4 groups: 1. the top 3 highest paid directors' executive compensation and executive characteristics; 2. the top 3 highest paid directors' ownership and firm ownership; 3. board characteristics; 4. firm size and performance measures. The characteristics of the key variables were analyzed, which includes the mean, median, range, standard deviation, skewness and kurtosis values, pattern of distribution and possible outliers.

7.2.1 Executive compensation and characteristics

Table 7.1a Executive compensation in Chinese listed companies

	year	N	mean	p50	sd	min	max	skewness	kurtosis
hpdtot	1998	71	39	33	30.38	10	163	2.27	9.11
	1999	71	42	34	28.41	10	150	1.77	6.75
	2000	71	53	39	36.43	10	153	1.22	3.83
	2001	71	70	59	55.86	10	400	3.24	18.43
hpd2tot	1998	67	30	28	19.20	6	126	2.09	10.47
	1999	63	35	30	23.67	10	140	2.03	8.43
	2000	66	45	36.5	31.18	8	134	1.17	3.61
	2001	65	56	47	44.12	7	300	3.02	15.93
hpd3tot	1998	61	27	24	16.42	9	101	1.90	8.40
	1999	59	30	25	19.81	2	112	1.89	7.62
	2000	56	38	29.5	27.50	4	120	1.44	4.68
	2001	58	49	39	42.99	7	300	3.82	21.74
hpdage	1998	71	51	52	7.55	30	66	-0.55	3.17
	1999	71	50	51	8.15	29	64	-0.86	3.21
	2000	71	49	51	7.85	32	65	-0.33	2.27
	2001	71	49	48	8.07	31	66	-0.10	2.19
hpd2age	1998	67	48	50	8.16	32	60	-0.39	1.87
	1999	63	47	48	7.92	28	59	-0.37	2.13
	2000	66	45	46.5	8.39	29	60	-0.07	2.09
	2001	65	46	47	8.65	26	61	-0.14	2.12
hpd3age	1998	61	47	48	8.60	27	61	-0.39	2.52
	1999	59	47	47	8.54	24	62	-0.33	2.57
	2000	56	46	45	8.39	25	63	0.01	2.40
	2001	58	46	46.5	8.18	31	64	0.09	2.21
hpdtenur	1998	71	3	2	1.57	1	6	0.80	2.66
	1999	71	3	3	1.61	1	7	0.56	2.52
	2000	71	4	3	1.92	1	8	0.48	2.53
	2001	71	4	3	2.00	1	9	0.64	2.69
hpd2tenur	1998	67	3	2	1.45	1	6	0.81	2.73
	1999	63	3	3	1.53	1	7	0.71	3.00
	2000	66	3	3	1.74	1	8	0.55	2.76
	2001	65	4	4	2.21	1	9	0.34	2.30
hpd3tenur	1998	61	2	2	1.35	1	6	1.14	3.82
	1999	59	3	3	1.53	1	7	0.79	3.14
	2000	56	3	3	1.73	1	8	0.43	2.62
	2001	58	4	4	1.97	1	9	0.37	2.47

hpdtot, hpd2tot, hpd3tot are expressed in thousands of Chinese Yuan (Renminbi).

Please see Appendix 2 for the definitions of variables.

Table 7.1b Executive gender

gender	Year	Freq.	Per	Freq.	Per	Freq.	Per
		hpd		hpd2		hpd3	
M	1998	70	0.99	59	0.89	54	0.96
F		1	0.01	7	0.11	2	0.04
M	1999	63	0.89	55	0.92	43	0.84
F		8	0.11	5	0.08	8	0.16
M	2000	66	0.93	63	0.90	59	0.94
F		5	0.07	7	0.10	4	0.06
M	2001	71	100.00	62	0.94	58	0.88
F		0	0.00	4	0.06	8	0.12

Table 7.1a presents characteristics of executive compensation, age, tenure and gender for the top 3 highest paid directors for the Chinese sample. It includes mean, median, standard deviation, range, skewness and kurtosis values.

The skewness value indicates the symmetry of the distribution. The kurtosis values provide information on the 'peakedness' or 'flatness' of the distribution. If the distribution of the variable is perfectly normal, the skewness and kurtosis value is 0, but it is rather uncommon in social sciences (Pallant, 2007). Tabachnick and Fidell (2007) argue that with reasonably large samples (200+ cases), skewness will not make a substantial difference in the analysis. Kurtosis can result in an underestimate of the variance, but this risk is also reduced with a large sample.

The skewness values of the top 3 executive compensation variables indicate that they were positively skewed, which means there were a great number of small compensation values. This result concurs with the comment of 'under-compensation'

and ‘zero-compensation’ of top managerial staff in Chinese listed companies by Fung et al.(2003) and Zhang (2003). The histogram and boxplot of the top 3 executive compensation variables were checked for potential outliers. There was 1 extreme outlier and a few outliers which extended more than 1.5 box lengths from the edge of the box for each of the top 3 executive compensation variables. All 3 extreme outliers of the top 3 executive compensation variables belong to one firm/year observation and it will be deleted in later regression analysis.

The kurtosis values of the top 3 executive compensation variables were relatively high, which indicates peaked distributions. Both skewness and kurtosis values and normality tests on the top 3 executive compensation variables suggest violation of the assumption of normality underlying the OLS regression techniques. To solve the problem, one approach is to ‘transform’ the variables using various formulas until the distribution looks more normal (for example, logarithmic and square root transformation). In the cases with positive skewed and peaked distributions, the logarithm transformation on executive compensation variables was used. The skewness, kurtosis and normality test results were significantly improved after the top 3 executive compensation variables were transformed by logarithm.

Table 7.1a shows that firstly, the total cash compensation of the highest paid director (hpd1tot), the second highest paid director (hpd2tot) and the third highest paid director (hpd3tot) in Chinese listed companies increased significantly from 1998 to

2001. All three executive compensation variables increased at a similar rate - by 78.7%, 85.5% and 78.8% respectively from 1998 to 2001. However, despite the substantial year-by-year pay increase, executive compensation is still much lower than executive pay levels in developed countries. For example, the average highest paid director compensation in the current study is RMB39,000 (GBP2,724) in 1998, RMB42,000 (GBP2,933) in 1999, RMB53,000 (GBP3,701) in 2000 and RMB70,000 (GBP4,888) in 2001. On the other hand, Core et al. (1999) report an average cash compensation of USD614,000 for a sample of 205 companies in the US between 1982 and 1984. Ezzamel and Watson (2002) report an average CEO cash compensation of GBP387,600 for a sample of 178 firms in the UK in 1995. Therefore, although executive compensation in Chinese listed companies has increased significantly, it is still low when compared to that in developed countries.

Secondly, for each of the executive compensation measures, the pay difference between HPD (the highest paid director) and HPD2 (the second highest paid director) was greater than the pay difference between HPD2 and HPD3 (the third highest paid director). For example, in 1998, moving from HPD2 to HPD increased the mean compensation by 29.8% (i.e. from RMB30,000 to RMB39,000). Moving from HPD3 to HPD2 increased the mean compensation by 11.8% (i.e. from RMB27,000 to RMB30,000). This pattern of results repeated itself across the years between 1998 and 2001 and it repeated for both mean and median pay.

Thirdly, the average age of the top 3 highest paid directors decreased steadily over the 4-year period. For example, the average age of the highest paid director decreased from 51 to 49 years old. This trend of recruiting younger executive directors could be influenced by the trend of using younger officials in the government recently. For example, in the 2007 provincial Party election, it was made compulsory that at the Party's provincial committee, at least 3 seats must be kept for those who were under 50 years old and at least 1 seat must be kept for those who were under 45 years old (news.ifeng.com⁶). As most of the Chinese listed companies are former State-owned enterprises and there is close and frequent staff exchange between the government and the government-controlled enterprises, it is sensible to infer that Chinese listed companies have followed similar standards when appointing directors. Meanwhile, Table 7.1a also shows that the tenure of the top 3 highest paid directors increased steadily. In other words, compared with early 1990s, the Chinese listed companies now have a more stable executive team, which indicates a more consistent and systematic management system.

Fourthly, as Table 7.1b shows, Chinese boards of directors were mostly male-dominated. Of all the 71 companies in the sample, only 1 highest paid director was a female in 1998 and all of the 71 highest paid directors were male in 2001.

In order to control the heterogeneity of individual directors, age, tenure and gender

⁶ http://news.ifeng.com/mainland/200701/0125_17_67969.shtml

of the top 3 highest paid directors will be used in the later regression analysis.

Table 7.1c Executive pay dispersion variables

	year	N	mean	p50	sd	min	max	skew	kurt
WD	1998	67	0.11	0.10	0.12	-0.57	0.36	-2.59	18.36
	1999	63	0.12	0.11	0.13	-0.58	0.39	-2.14	15.76
	2000	66	0.15	0.10	0.13	-0.07	0.56	1.41	4.80
	2001	62	0.17	0.14	0.12	0.00	0.65	1.36	5.51
CVW	1998	71	0.011	0.007	0.03	-0.14	0.16	-0.10	22.35
	1999	71	0.013	0.006	0.03	-0.15	0.16	0.92	15.56
	2000	71	0.015	0.008	0.02	-0.01	0.14	3.00	12.73
	2001	70	0.017	0.012	0.03	0.00	0.25	6.07	44.70

$WD = \text{Log}(W_1) - \text{Log}(W_A)$; $CVW = (W_1 - W_E) / W_E$. W_1 = cash compensation of the highest paid director in Chinese listed companies; W_A = the average cash compensation received by the contestants, which is the average cash compensation received by the executive team except the highest paid director in Chinese listed companies; W_E = the average cash compensation of executive directors.

Table 7.1c shows the descriptive statistics of the executive pay dispersion variables. WD refers to the logarithm difference between HPD compensation and the average compensation received by the executive team except the highest paid director in Chinese listed companies. CVW refers to the coefficient of variation of executive pay, measured by the standard deviation of executive pay divided by the average pay. CVW has a skewed and peaked distribution across 4 years. To reduce the problem of non-normality, logarithm transformation will be used in the data analysis to check the robustness of regression results.

7.2.2 Executive ownership and firm ownership

Table 7.2 Ownership variables

	year	N	mean	p50	sd	min	max	skew	kurt
hpd	1998	71	6.4E-05	2.8E-05	9.8E-05	0	0.00057	2.82	12.55
	1999	71	5.6E-05	2.5E-05	9.4E-05	0	0.00057	3.21	15.29
	2000	71	5.1E-05	1.8E-05	9.7E-05	0	0.00056	3.40	15.83
	2001	71	4.9E-05	9.0E-06	1.0E-04	0	0.00058	3.35	14.99
hpd2	1998	71	3.5E-05	1.9E-05	4.4E-05	0	0.00021	1.64	5.55
	1999	71	2.9E-05	1.6E-05	4.2E-05	0	0.00021	1.96	7.01
	2000	71	2.2E-05	0.0E+00	4.2E-05	0	0.00025	3.09	14.12
	2001	71	2.5E-05	2.0E-06	4.6E-05	0	0.00025	2.67	10.91
hpd3	1998	71	2.7E-05	1.4E-05	4.4E-05	0	0.00021	2.40	8.63
	1999	71	2.5E-05	1.0E-05	4.0E-05	0	0.00021	2.46	9.33
	2000	71	2.7E-05	5.0E-06	5.4E-05	0	0.00029	3.14	13.66
	2001	71	1.9E-05	0.0E+00	4.0E-05	0	0.00025	3.59	18.18
state	1998	71	40.21	49.03	26.96	0	81.82	-0.33	1.70
	1999	71	37.80	40.99	27.26	0	81.82	-0.20	1.59
	2000	71	36.03	37.92	26.45	0	81.82	-0.10	1.63
	2001	71	36.18	38.35	25.63	0	81.82	-0.16	1.68
legal	1998	71	15.21	0.15	22.88	0	77.29	1.40	3.65
	1999	71	16.20	2.47	22.78	0	77.29	1.23	3.10
	2000	71	15.95	1.61	22.53	0	77.30	1.25	3.19
	2001	71	14.20	0.64	21.40	0	73.37	1.41	3.69
forgn	1998	71	0.94	0.00	5.80	0	43.17	6.41	44.15
	1999	71	0.94	0.00	5.80	0	43.17	6.41	44.15
	2000	71	0.94	0.00	5.80	0	43.17	6.41	44.15
	2001	71	0.94	0.00	5.80	0	43.17	6.41	44.15

All ownership variables are in percentage of total shares of the company.

Please see Appendix 2 for the definitions of variables.

As Table 7.2 shows, the average percentages of shareholdings for each of the top 3 highest paid directors were very small. The maximum percentage of the highest paid director's shareholdings in 1998 was only 0.057%. In 81 out of 284 firm/year observations, the highest paid directors had zero ownership. The skewness and

kurtosis tests show that the top 3 executive ownership variables had positive skew and peaked distribution. To solve the non-normal distribution problem, the 3 executive ownership variables were transformed by logarithm. The normality tests of the 3 executive ownership variables show significantly improved results after the logarithm transformation. The square of executive ownership was also included in the regression to test the possible non-linear relationship between firm performance and executive ownership.

Table 7.2 also shows that although state ownership decreased steadily from 40.21% to 36.18% from 1998 to 2001, it was still the largest shareholder in most Chinese listed companies. The percentage of state ownership had a negatively skewed distribution, which means there are greater numbers of large percentages of state ownership. The average percentage of foreign ownership was rather small - 0.94%. Moreover, there were only 2 companies (8 observations) which had foreign ownership in this sample. 63 out of 284 firm/year observations had zero state ownership. 132 out of 284 firm/year observations had zero legal person ownership. 276 out of 284 firm/year observations had zero foreign ownership. Due to the large numbers of zero value in the state, legal person and foreign ownership data, the 3 ownership variables were recoded as dummy variables (i.e. the variables equal to 1 if there is a presence of state/legal person/foreign ownership in the company, 0 otherwise) to examine the effects of ownership on executive compensation.

7.2.3 Board characteristics

Table 7.3a Board of directors

	year	N	mean	p50	sd	min	max	skew	kurtosis
board	1998	71	9.83	9	2.94	5	19	0.87	3.97
	1999	71	9.63	9	2.64	6	19	1.20	4.79
	2000	71	9.45	9	2.41	5	18	0.83	3.97
	2001	71	9.37	9	2.47	5	18	1.03	3.93
affi	1998	71	4.00	3	3.53	0	14	0.72	2.73
	1999	71	4.03	3	3.48	0	15	0.94	3.53
	2000	71	4.11	4	3.33	0	15	0.84	3.64
	2001	71	4.14	4	3.31	0	15	0.88	3.70
indep	1998	71	0.14	0	0.57	0	4	5.20	32.82
	1999	71	0.17	0	0.61	0	4	4.49	25.24
	2000	71	0.23	0	0.72	0	4	3.55	15.72
	2001	71	0.51	0	1.13	0	5	2.30	7.49
peraff	1998	71	0.39	0.36	0.30	0	0.92	0.10	1.65
	1999	71	0.41	0.44	0.29	0	0.92	0.06	1.76
	2000	71	0.43	0.43	0.29	0	0.92	-0.11	1.73
	2001	71	0.43	0.44	0.28	0	0.92	-0.10	1.87
perindp	1998	71	0.01	0	0.05	0	0.31	4.46	23.86
	1999	71	0.02	0	0.05	0	0.31	3.85	18.15
	2000	71	0.02	0	0.07	0	0.33	3.28	13.14
	2001	71	0.05	0	0.11	0	0.38	1.93	5.21

Please see Appendix 2 for the definitions of variables.

Table 7.3b Board duality

	dual1	Freq.	Percent	dual2	Freq.	Percent
1998	0	58	0.82	0	47	0.66
	1	13	0.18	1	24	0.34
1999	0	58	0.82	0	45	0.63
	1	13	0.18	1	26	0.37
2000	0	53	0.75	0	38	0.54
	1	18	0.25	1	33	0.46
2001	0	67	0.94	0	51	0.72
	1	4	0.06	1	20	0.28

dual1 =1 if CEO and Chairman are the same person, 0 otherwise; dual2 =1 if CEO and Chairman or CEO and deputy Chairman are the same person, 0 otherwise.

Table 7.3c Board political power

year	party1	Freq.	Per	party2	Freq.	Per	party3	Freq.	Per
1998	0	32	0.45	0	66	0.93	0	70	0.99
	1	39	0.55	1	5	0.07	1	1	0.01
1999	0	33	0.47	0	67	0.96	0	69	0.99
	1	37	0.53	1	3	0.04	1	1	0.01
2000	0	31	0.44	0	68	0.96	0	71	1.00
	1	40	0.56	1	3	0.04	1	0	0.00
2001	0	41	0.58	0	66	0.93	0	70	0.99
	1	30	0.42	1	5	0.07	1	1	0.01

party1=1 if the highest paid director is Chairman, 0 otherwise; party2=1 if the second highest paid director is Chairman, 0 otherwise; party3=1 if the third highest paid director is Chairman, 0 otherwise.

Table 7.3a shows board size and board composition in this Chinese sample. The average board size decreased slightly from 9.83 to 9.37 between 1998 and 2001. The median of board sizes remained constant at 9 between 1998 and 2001. Board size ranged between 5 and 19 over the period. When comparing with their Western counterparts, Chinese boards of directors are relatively small. In Yermack's (1996)

sample of US companies between 1984 and 1991, he reports that board size ranges between 4 and 34 for sample firms, with a mean of 12.25 and a median of 12. Two factors could have led to the relatively small boards of directors in China. Firstly, boards of directors were only introduced to Chinese firms in the early 1990s; and secondly, most Chinese companies had a shorter history so there was not enough time for the board to ‘accumulate’ to large size.

As discussed in Chapter 6, there are 3 types of directors in Chinese listed firms: 1. executive directors who are directly involved in the day-to-day management of the shareholding company; 2. affiliated directors who represent the state or legal person (institutional) shareholders and directors who provide financial, legal or consulting services to the listed company or its subsidiaries; 3. independent directors who are not stated above. As the table shows, the average number of affiliated directors on boards increased slightly from 4 to 4.14 between 1998 and 2001. The average number of independent directors increased from 0.14 to 0.51. More specifically, there were 284 firm/year observations in this sample, 248 observations had zero independent directors on the board, which indicates that by the end of 2001, the concept of ‘independent director’ was still a new thing to most Chinese listed companies. In other words, Chinese boards are insider-dominated and are less independent due to the small number of independent directors and the relatively large number of affiliated directors on the board. Statistically, the percentage of independent directors on the board had a positively skewed and peaked distribution due to the large number of zero

values. The independent director variable will be recoded as a dummy variable in the regression analysis (i.e. equals 1 if there independent directors are present, 0 otherwise).

Table 3b shows two measures of board leadership structure: dual1 refers to the duality of CEO and Chairman and dual2 refers to both CEO/Chairman duality and CEO/Deputy Chairman duality. The percentage of CEO/Chairman duality increased first from 18% in 1998 to 25% in 2000, then decreased significantly to 6% in 2001. The percentage of CEOs who also served as Chairmen or Deputy Chairmen had the same trend, increasing first from 34% to 46%, then decreasing to 28% in 2001. This result was probably a response to the two guidelines issued by the China Securities Regulatory Commission (CSRC) in 2001: the Code of Corporate Governance for Listed Companies in China and the Guidelines for Introducing Independent Directors to the Board of Directors of Listed Companies. In order to alleviate agency problems, these guidelines called for more independent and efficient boards and emphasized the transparency and information disclosure on corporate governance in Chinese listed companies. One key suggestion was to separate the posts of CEO and Chairman. This may explain the sharp decrease in both measures of board duality in 2001.

Table 7.3c shows the measure of political duality of the top 3 highest paid directors. According to the regulations from the State-owned Assets Supervision and Administration Committee of the State Council (SASAC) Shanghai branch and

Shenzhen branch, if the Chairman is a Party member, he or she should also serve as the Party Secretary. Therefore, Chairman is used as a proxy for Party Secretary in the present study. The percentage of the highest paid directors, second highest paid directors and third highest paid directors who were Chairman/Party Secretary was 55%, 7% and 1% respectively in 1998. This is consistent with hypothesis 1 that executive compensation is positively related to the director's political power.

7.2.4 Firm size and performance measures

Table 7.4 below shows the statistics of the measurements of performance: earnings per share (eps), return on assets (roa) and adjusted Tobin's Q (Q_{adj}); and companies' size measurements: total assets (totasset) and sales (sales). The average earnings per share and return on assets remained stable between 1998 and 2000 at around 0.24 and 0.05 respectively; it then declined sharply in 2001. The histogram and boxplot of the two variables show that there were extreme outliers in 2001. This was also reflected by the range, skewness and kurtosis values. The extreme outliers will be deleted in the regression analysis. The average total assets and sales increased steadily between 1998 and 2001. Both total assets and sales had positively skewed and peaked distributions, so both variables were transformed by logarithm.

Table 7.4 Firm size and performance variables

	year	N	mean	p50	sd	min	max	skewness	kurtosis
totasset	1998	71	1381	811	1871	144	12000	3.77	19.02
	1999	71	1504	896	1830	185	11500	3.44	16.74
	2000	71	1621	1186	1688	161	11400	3.37	18.09
	2001	71	1766	1309	1770	155	11200	2.96	14.19
sales	1998	71	659	307	1130	1	6772	3.78	18.46
	1999	71	756	346	1248	26	7076	3.59	16.88
	2000	71	860	369	1511	9	9014	3.78	18.54
	2001	71	869	422	1444	12	7809	3.46	15.43
eps	1998	71	0.24	0.26	0.345	-1.363	1.729	-0.46	12.77
	1999	71	0.21	0.24	0.301	-0.742	1.352	-0.14	6.78
	2000	71	0.21	0.22	0.284	-0.537	1.6	1.29	10.62
	2001	71	0.04	0.18	0.657	-4.708	0.934	-5.47	39.70
roa	1998	71	0.05	0.06	0.07	-0.24	0.2	-1.57	7.64
	1999	71	0.05	0.05	0.066	-0.16	0.2	-0.71	5.23
	2000	71	0.04	0.04	0.057	-0.15	0.19	-0.42	5.24
	2001	71	-0.04	0.03	0.482	-3.99	0.14	-7.88	64.99
Q_adj	1998	69	1.46	1.39	0.455	0.7	3.51	1.54	7.49
	1999	69	1.60	1.51	0.419	0.97	3.11	1.50	6.03
	2000	69	1.97	1.80	0.65	0.94	4.97	1.65	7.99
	2001	70	1.74	1.55	0.73	0.91	6.34	3.84	23.79

totasset and sales are in millions of Chinese Yuan (Renminbi).

Please see Appendix 2 for the definitions of variables.

7.3 Correlation Analysis

Correlation analysis was used to identify the linear relationship between variables at the initial stage and also to check the multi-collinearity between variables. Table 7.5 presents a simple correlation matrix of linear relationship between all the continuous variables for the pooled data between 1998 and 2001. All the correlation coefficients which were significant at the .10 level of significance are displayed. The correlation coefficients which were significant at the .05 level of significance are displayed with a star.

Table 7.5 Pairwise correlation coefficients

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1hpdttot	1																											
2hpdage		1																										
3hpdten	0.11	0.28*	1																									
4hpd2tot	0.89*			1																								
5hpd2age	-0.22*	0.25*	0.16*	-0.22*	1																							
6hpd2ten	0.17*	0.19*	0.46*	0.15*	0.22*	1																						
7hpd3tot	0.88*			0.96*	-0.22*	0.11	1																					
8hpd3age		0.17*			0.29*			1																				
9hpd3ten		0.14*	0.47*		0.15*	0.49*		0.16*	1																			
10hpdwn		0.17*	0.38*			0.12			0.17*	1																		
11hpd2own		0.15*	0.19*		0.16*	0.31*		0.17*	0.17*	0.40*	1																	
12hpd3own		0.16*	0.17*			0.12		0.22*	0.21*	0.45*	0.59*	1																
13state	-0.14*				0.18*			0.18*		-0.14*			1															
14legal					-0.12					0.14*			-0.75*	1														
15foreign	0.26*			0.14*	-0.11	0.12	0.15*		0.11	0.14*			-0.23*		1													
16board								0.19*		-0.22*	-0.15*				-0.12	1												
17peraff	0.10	-0.21*			-0.19*			-0.18*	-0.18*		-0.25*	-0.32*	-0.23*	0.24*		0.15*	1											
18perindp	0.24*			0.31*		0.13*	0.33*			-0.11		-0.13*					-0.23*	1										
19dual1																0.11			1									
20dual2										-0.16*								0.60*	1									
21location	0.37*	-0.12*		0.36*	-0.24*		0.31*	-0.14*					-0.38*	0.30*	0.20*		0.40*				1							
22yripo	0.36*		0.26*	0.41*	-0.14*	0.24*	0.36*	-0.17*	0.28*			-0.11	-0.26*		0.23*	-0.14*	0.17*	0.18*			0.32*	1						
23totasset	0.17*	0.18*		0.23*			0.27*	0.19*		-0.15*	-0.15*	-0.12*				0.32*	-0.12*	0.29*			0.10	0.14*	1					
24sales		0.12*		0.13*			0.18*	0.22*		-0.12*	-0.14*					0.30*	-0.17*	0.22*					0.87*	1				
25ops	-0.17*			-0.20*	-0.16*				-0.14*		-0.18*		0.13*	-0.29*				-0.29*				-0.35*		0.19*	1			
26roa	-0.19*			-0.22*	-0.20*				-0.14*		-0.20*		0.11	-0.27*				-0.29*				-0.23*			0.83*	1		
27Q_adj		-0.14*				-0.13*	-0.20*						-0.19*			-0.34*					0.20*	-0.39*	-0.33*	-0.35*	-0.44*	1		
28D/E	0.14*			0.18*		0.10		0.24*							0.24*	0.24*		0.24*			0.16*	0.22*	0.30*	0.16*	-0.39*	-0.36*	-0.23*	1

The correlation coefficients are displayed at the .10 significance level.

The coefficients are displayed with a star at the .05 significance level.

Firstly, as table 7.5 shows, *hpdtot* (the highest paid director's pay) was highly correlated with *hpd2tot* (the second highest paid director's pay) and *hpd3tot* (the third highest paid director's pay). *hpdtot* was significantly positively correlated with HPD (the highest paid director) tenure, HPD2 pay, HPD3 pay, foreign ownership, percentage of affiliated directors, percentage of independent directors, location, year after IPO, total assets and debt/equity ratio (D/E). *Hpdtot* was also significantly negatively related to state ownership, earnings per share and return on assets. The correlation results show that the HPDs had greater levels of cash compensation with longer years of employment in current position; with higher foreign ownership; with lower state ownership, with more independent directors on the board; when the company is located in Beijing, Shanghai or South East coastal cities; with longer company history (proxied by the year after initial public offering); with larger firm size; with higher debt/equity ratio and with lower earnings per share and lower return on assets.

Most of the correlation signs are consistent with the research assumptions, except the two firm performance variables. There are a number of reasons which may explain the negative correlation between *hpdtot* and firm performance variables. First, *hpdtot* only includes cash compensation in the sample. There are other kinds of compensation such as housing benefits, medical insurance, shares and options which are not included due to the unavailability of data. Moreover, as Table 7.2 shows, state ownership and legal person ownership in total counts for around 53% of the overall

ownership in the sample companies, which means over half of the shares are controlled directly or indirectly by the Chinese government. Firth et al. (2006) argue that those firms where the State is the dominant shareholder will place less weight on performance-related pay for the CEO. State-controlled listed firms are more likely to relate the CEO's compensation to the civil pay scales and so pay lower remuneration. Sun et al. (2002) argue that government ownership is inferior to private ownership in that the government chooses social and political policy goals over profit maximization. Second, the CEOs' compensation is usually capped by 3 to 15 times the average workers' salary by the local SASAC branches (State-owned Assets Supervision and Administration Commission of the State Council) for equality and impartiality. It was reported that the CEO compensation in state-owned enterprises in Beijing should not be greater than 9 times the average workers' salary by the SASAC Beijing Branch⁷. In Zhejiang Province, SASAC Zhoushan City Branch proposed a regulation in 2005 which sets CEO basic compensation at 1.5 to 3 times the average workers' salary⁸. These regulations indicate that the CEOs in companies with dominant state ownership are not compensated at the market price as happens in developed countries. Third, since the firm performance included in the correlation matrix is the current year's performance, it might only be reflected in executive compensation next year. Hence lagged firm performance may be more appropriate in the regression analysis on executive compensation and firm performance.

⁷ <http://finance.sina.com.cn/china/dfjj/20071228/07344346373.shtml>

⁸ <http://zhaopin.smehrb.gov.cn/xinzhi/20070510/105108.shtml>

Secondly, the ownership of the HPD, HPD2 and HPD3 was not correlated with their executive compensation. The ownership of the HPD, HPD2 and HPD3 was significantly negatively related to state ownership, board size, percentage of independent directors, duality2, total assets and sales. Board size was positively related to duality1, total assets, sales and D/E ratio and was negatively related to Tobin's Q.

Thirdly, the compensation of the HPD, HPD2 and HPD3 was highly and significantly correlated with each other (0.89, 0.88, 0.96), which reflects the internal comparison effects of executive pay in this sample of Chinese boards of directors. There were significant correlations between the HPD, HPD2 and HPD3 ownership (0.40, 0.45, 0.59). The two firm size proxies - total assets and sales - were highly correlated (0.87). The two performance variables - earnings per share and return on assets - were highly correlated as well (0.83). No high correlations were found between other variables except for those high correlation coefficients mentioned above. The variance inflation factors (VIF) will be examined in the next chapter to check the problem of multicollinearity.

7.4 Conclusion

In this chapter, the statistical characteristics of the data have been explored. Specifically, the descriptive statistics of the key variables were presented, including the top 3 highest paid executives' compensation, top 3 highest paid executives' characteristics, top 3 highest paid executives' ownership, board characteristics and firm performance measurements. The descriptive statistics include mean, median, range, standard deviation, skewness and kurtosis values. The distributions of the variables were checked in terms of normality and possible outliers. When there was a problem of non-normal distribution, possible data transformation was discussed. Finally, to explore the association between key variables, the correlation coefficients were presented to illustrate the strength and direction of the linear relationship between key variables.

Correlation analysis provides an indication that there is a relationship between two variables, but it does not indicate that one variable causes the other. In addition, the possibility of other variables that influences both of the observed variables should always be considered (Pallant, 2007). Further empirical analysis will be conducted in the next chapter on executive compensation, ownership, board characteristics and firm performance in three theoretical models: the managerial ownership model, tournament model and simultaneous model.

Chapter 8 Data Analysis

8.1 Introduction

This thesis studies the determinants of executive compensation in Chinese listed companies based on three theoretical models: the managerial power model, tournament model and simultaneous model. To improve the understanding and design of executive director incentives in China, individual executive compensation data from three hierarchical levels (the highest paid director, the second highest paid director and the third highest paid director) is employed to evaluate the ability of the managerial power model, tournament model and simultaneous model to explain this observed executive compensation data.

In Chapter 7, the descriptive statistics and correlation analysis on executive compensation, executive ownership, board characteristics, firm performance data and other control variables are presented. This chapter provides detailed regression analysis on three executive compensation models. Three different regression techniques are employed for testing the models: OLS (ordinary least squares) regression, panel data analysis and 3SLS (three-stage least squares) regression. Two datasets are used in the data analysis: the first dataset includes the 779 top 3 highest paid directors in the 71 Chinese listed companies between 1998 and 2001. The second

dataset includes the 284 highest paid directors (HPD) in the 71 Chinese listed companies between 1998 and 2001.

The rest of the chapter is organized as follows: section 2 presents empirical evidence of managerial power theory on executive compensation. Section 3 provides regression analysis of the tournament model. Section 4 presents the empirical results for the simultaneous regression model on executive compensation, executive ownership and board characteristics. Section 5 is the conclusion.

8.2 Managerial Power Model and Executive Compensation

The following managerial power and executive compensation hypothesis has been developed in chapter 5 and will be empirically tested in this section by OLS and/or panel data regression, using the data on Chinese listed companies.

Hypothesis 1: the level of executive compensation is positively related to the level of executive power in Chinese listed companies.

8.2.1 Model 1: managerial power and executive compensation (Hypothesis 1)

The relationship between managerial power and executive compensation in Chinese listed companies was examined by testing hypothesis 1. It states that the level

of executive compensation is positively related to the level of executive power in Chinese listed companies. The regression equation takes the following form:

$$\text{Log}(W) = \beta_0 + \beta_1 \text{OWN} + \beta_2 \text{PARTY} + \text{control} + \varepsilon \quad (8.1)$$

$$\text{Log}(W) = \beta_0 + \beta_1 \text{OWN} + \beta_2 \text{OWN}^2 + \beta_3 \text{OWN}^3 + \beta_4 \text{PARTY} + \text{control} + \varepsilon \quad (8.1a)$$

where $\text{Log}(W)$ = logarithm-transformed executive compensation in Chinese listed companies;

OWN (proxy for director's structural power) = the percentage of outstanding shares owned by the executive directors.

There are two measures of executive ownership: 1. percentage of executive (HPD, HPD2 and HPD3) ownership and 2. percentage of HPD ownership.

PARTY (proxy for director's political power) = 1 if the director is Chairman (who also serves as the Party secretary), 0 otherwise.

control = control variables, including firm size, corporate governance variables, individual and firm characteristics and year dummies. Corporate governance variables include board size, percentage of independent directors, CEO/Chairman duality and the ratio of debt to equity. Individual characteristics include age, age square, tenure, tenure square and gender of executive directors. Firm characteristics include firm size, firm age, ownership structure, firm risk and company location.

ε = estimation error.

8.2.2 Regression results

Table 8.1: Model 1 Executive compensation and managerial power

This table shows the regression results of the relationship between executive compensation and managerial power in Chinese listed companies. The dependent variable in this table is the logarithm of executive compensation. Please see Appendix 2 for the definitions of independent variables. Model 1A utilizes the robust regression method with standard errors clustered by firm. Model 1B utilizes the fixed-effects method. Values of t-statistics are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Dependent Variable	Model 1A	Model 1B
lgW		
perown	439.368**	424.543***
Party	0.072**	0.055**
Age	0.012	0.012
Agesq	-0.0001	-0.0001
Tenure	-0.044**	-0.002
Tensq	0.005**	0.001
gender	-0.087**	-0.066*
lgasset	0.277***	0.133**
board1	-0.010*	-0.006
perindp1	0.497***	0.408***
duality1	0.020	0.055*
duality21	0.072**	-0.021
state	-0.001	-0.001
legal	-0.003***	-0.002*
foreign	0.005*	
location1	0.170***	
yripo1	0.014	0.063***
sdev1	0.002***	0.001***
debt1	-0.065	-0.172***
Industry dummies	Yes	Yes
Year dummies	Yes	Yes
Constant	-0.349	0.351
Observations	758	758
R^2 (overall)	0.445	0.225
R^2 within		0.422
R^2 between		0.140

The datasets used in Models 1A and 1B contain individual information on 758 executive directors in 68 Chinese listed companies from 1998 to 2001.

Table 8.1 presents the regression results of Model 1A (robust regression with standard errors clustered by firm) and Model 1B (fixed-effects model). Model 1A regressed the logarithm of executive compensation on the percentage of executive ownership and political power (Party) after controlling for firm size, corporate governance variables, individual and firm characteristics and year dummies. Model 1B conducted fixed-effects regression on the same variables, excluding industry dummies and location as they are constant variables in the fixed-effects regression. F tests show that both models are significant at the 1% level of significance. Model 1A explains 42.2% of the total variances of executive compensation in this sample of Chinese listed companies. Model 1B explains 42.2% within-firm variances and 14% between-firm variance of executive compensation in the sampled Chinese listed companies.

Model 1A shows that after controlling for individual and firm characteristics, the coefficients of the level of executive ownership (perown) and political power (Party) are both positive and significant at the 5% level of significance, which indicates that a 0.01% increase in executive shareholdings will result in a 4.39% increase in compensation. If the director is also a Party Secretary, his/her compensation will increase by 7.22%. Model 1B produced similar results. The coefficients of executive ownership and political power (Party) are both positive and significant at the 1% and 5% level of significance respectively, which indicates that a 0.01% increase in executive shareholdings will result in a 4.25% increase in compensation. If the

director is also a Party Secretary, his/her compensation will increase by 5.5%. These results generally support hypothesis 1 in that managerial power (ownership power and political power) is positively related to executive compensation.

For control variables, it shows that female directors tend to be paid less and there is a U-shaped relationship between tenure and executive compensation. It also shows that directors are paid more when the firm size is bigger, when boards are smaller, when the percentage of independent directors is higher, when the CEO also serves as deputy board chair, when firm risk is higher and when the company is located in Beijing, Shanghai or other southeastern cities. Executive compensation is negatively related to legal person ownership (1% sig. level), and positively related to foreign ownership (10% sig. level).

After re-running Model 1 by using equation 8.1a, the adjusted R square was improved slightly. The percentage of executive ownership (perown) became insignificant and perown3 (perown cube) was dropped by the regression because the value was too small. The coefficient of Perown2 (perown square) is positive and significant, which suggests that there is a U-shaped relationship between executive ownership and (log) executive compensation. Political power (Party) still has a positive and significant relationship with executive compensation. Other variables remained consistent with model 1A. Model 1 was also re-run by using the logarithm of percentage of executive ownership. After that, the coefficient became less

significant because there were many directors with zero ownership and those observations were deleted after logarithm transformation.

The executive ownership results are consistent with the findings of Chung and Pruitt (1996), Cheung et al. (2005) and Chen (2006). In this study, executive ownership serves as an indicator of the director's structural power because the Chinese government normally allocates shares to directors based on his or her rank in the managerial hierarchy. Therefore, the empirical results support hypotheses 1a and 1b and prove that executive compensation is positively related to structural power (executive ownership) in Chinese listed companies.

8.2.3 Regression diagnosis and robustness checks

8.2.3.1 Regression diagnosis

A few outliers were detected using a leverage versus residual squared plot after the regression. The regression results remained consistent for the key variables after deleting the extreme outliers, but the value of R square became 1% lower. Therefore the original sample was kept without deleting any outliers.

As discussed in chapter 7, executive ownership has a positively skewed distribution. To solve the problem of non-normality, executive ownership was transformed by

logarithm. However the test results of logarithm transformed ownership became insignificant because a large number of zero executive ownership were dropped by the logarithm transformation. Therefore the original form of executive ownership was kept in the model. State, legal and foreign ownership variables also have skewed distribution. Due to the large numbers of zero values in the state, legal person and foreign ownership data, the 3 ownership variables were recoded as dummy variables instead of using logarithm transformation. The regression results remain robust and consistent after the changing.

Model 1A was examined by the Ramsey RESET test for model specifications. Model 1A test result is $F(3, 724) = 0.98$, $\text{Prob.} > F = 0.40$. The null hypothesis that the model has no omitted variables cannot be rejected and therefore there are no omitted variables or mis-specification of the model.

The variance inflation factors (VIF) of the independent variables were checked in model 1 to detect the problem of multicollinearity. The VIFs in Model 1A are all below 4 after deleting Agesq (age square) and Tensq (tenure square) because of the functional relationship between age and age square, tenure and tenure square. Model 1A was re-run after removing Agesq and Tensq. The regression results remained consistent and the VIFs of the new model are all less than 4, which indicates that there is no problem of multicollinearity in the new model.

8.2.3.2 Robustness checks

As discussed in Chapter 6, since the sample data includes the same companies over time, OLS standard errors could be affected by a lack of independence. According to Petersen (2009), to solve the problem of possible biased OLS standard errors, the following methods can be used. First, year dummies are included in the regression analysis to control the time effect. Second, robust regression is employed with standard errors clustered by firm to control the firm effect. Third, fixed effect or random effect models are used when appropriate to produce unbiased standard errors.

Model 1 was examined by OLS, robust regression (with standard errors clustered by firm) and the fixed effects model. It is found that the OLS standard errors were mostly underestimated compared to robust standard errors clustered by firm, which suggests that OLS standard errors are biased estimations. Therefore, robust regression (with standard errors clustered by firm) and fixed-effects model were used to test hypothesis 1. As discussed in chapter 6, compared to time-series and cross-sectional studies, panel data analysis controls for individual heterogeneity, gives more informative data, more variability, less collinearity among the variables and greater efficiency. Furthermore, the biases resulting from aggregation over firms are eliminated. The Hausman specification test results for model 1A show that the fixed-effects model was both consistent and efficient ($\text{Chi}^2(7) = 14.47$, Prob. $>\text{chi}^2 = 0.0434$); therefore the fixed-effects model was chosen. The empirical results from the fixed-effects model show that a large fraction of variation of executive compensation

was explained by unobserved firm heterogeneity which is correlated with the independent variables. Year dummies were included in the regression to control the effect of time.

Previous literature reveals that the causality of executive ownership and compensation is still ambiguous. Managerial power can be viewed as either a determinant of or a consequence of executive ownership and compensation (Finkelstein, 1999; Grabke-Rundell and Gomez-Mejia, 2002). Many researchers propose that managerial ownership is endogenously determined by the contracting environment (Kole, 1996; Himmelberg et al., 1999). To address the possible problem of endogeneity, a two-stage least-square (2SLS) method was used to check the problem of endogeneity and whether the robust regression (with standard errors clustered by firm) estimates are consistent and unbiased. In the 2SLS model, tenure was used as the instrumental variable (IV) because 1. tenure is correlated with the endogenous variable executive ownership (*perown*) because the longer the time the executive stays in the company, the more the shares can be accumulated; 2. tenure would not correlate with executive compensation because compensation should be based on the executive's performance, qualifications and experience in the industry, instead of tenure in the company.

The regression results show that tenure has a significant and positive relationship with executive ownership (*perown*) (1% sig. level). Having tenure as the instrumental

variable, the Hausman test was used to examine whether the robust regression estimates are consistent with the instrumental variables regression (2SLS). The Hausman test result ($\text{Chi2}(1) = 1.06$, $\text{Prob} > \text{chi2} = 0.3034$) shows that robust regression (with standard errors clustered by firm) (Model 1A) estimates are consistent with the instrumental variables regression (2SLS). The fixed-effects model (1B) was also examined by the Hausman test. The test result ($\text{Chi2}(1) = 0.25$, $\text{Prob} > \text{chi2} = 0.6193$) suggests that the fixed-effects model estimates are also consistent with the instrumental variables regression, therefore the estimates are unbiased.

Further robustness checks for both models were conducted, following the steps below: 1. a different dataset was employed; instead of using all top 3 highest paid directors, only HPD compensation was used. The results are consistent except that Party (HPD political power) became less significant. The coefficients of HPD ownership and HPD political power are both positive and significant at the 1% and 10% level of significance respectively; 2. The percentage of independent directors was replaced by the percentage of non-executive directors; 3. debt/equity ratio was replaced by debt/total assets ratio; 4. ownership variables were coded as dummy variables; 5. firm size (logarithm of total assets) was replaced by logarithm of sales. The results remained robust and consistent after these changes except that the R square, the significance level and the magnitude of coefficients changed slightly.

8.3 Tournament models on executive compensation

Five hypotheses have been developed in chapter 5 and the following three hypotheses are related to the tournament model on executive compensation:

The tournament theory predicts that the function describing the relationship between executive compensation and organizational level is convex. The difference in compensation level for the CEO/highest paid director relative to the next lower position in the organizational hierarchy should be extraordinarily large relative to the changes in compensation levels observed at other points in the hierarchy. In this study, it is hypothesized that in Chinese listed companies, the pay difference between the highest paid director and the second highest paid director is bigger than the pay difference between the second highest paid director and the third highest paid director, but the difference between the two is not big enough to be a convex relationship (H2a). Moreover, higher state ownership would further reduce the pay difference between different levels (H2b).

The tournament theory predicts that the larger the number of executive directors (contestants), the greater the difference between CEO/highest paid director and average executive directors' compensation levels. In this study, it is hypothesized that the relationship between the executive pay gap and the number of contestants is weak in Chinese listed companies (H3a); and higher state ownership would further weaken

the relationship (H3b).

The tournament theory predicts that corporate performance is positively related with the executive pay gap. In this study, it is hypothesized that corporate performance is positively related with the executive pay gap (H4a), especially in less government-controlled Chinese listed companies (H4b).

Models 2, 3 and 4 are examined below to test the above hypotheses. All the above hypotheses were tested by OLS and/or panel data regression techniques using the sample data of Chinese listed companies.

8.3.1 Model 2: Executive pay and hierarchical levels (Hypothesis 2)

Model 2 examines the shape of executive compensation and organizational level and explores how political influence affects the organizational compensation structure in China. According to Lambert et al. (1993), Eriksson (1999) and Conyon et al. (2001), the relationship between executive compensation and organizational position/level was tested by the following regression model: two interaction terms (level1*gov and level2*gov) were added to model 8.2 to test the effect of political influence on compensation structure in Chinese listed companies.

$$\text{Log}(W) = \beta_0 + \beta_1 \text{level1} + \beta_2 \text{level2} + \beta_3 \text{level1} * \text{gov} + \beta_4 \text{level2} * \text{gov} + \text{control} + \varepsilon \quad (8.2)$$

where W = executive compensation in Chinese listed companies;

level = organizational level dummy; level1 = 1 if the executive director is the highest paid director and zero otherwise, level2 = 1 if the executive director is the second highest paid director and zero otherwise; level3 = 1 if the executive director is the third highest paid director and zero otherwise;

gov = the subtotal of state ownership and legal person ownership. Gov is used as a proxy to government ownership according to Sun et al. (2002).

control = control variables, including corporate governance mechanisms, individual and firm characteristics, year and industry dummies (control for macroeconomic and industry effects). Corporate governance variables include board size, percentage of independent directors, CEO/chairman duality and debt to equity ratio. Individual characteristics include age, tenure and gender of executive directors. Firm characteristics include firm size, firm age, ownership structure, firm risk, Tobin's Q and company location.

ε = estimation error.

According to Lambert et al. (1993) and Conyon et al. (2001), the β_2 coefficient is the average change in log compensation between the second highest paid director and the third highest paid director; the third highest paid director is the excluded category.

$(\beta_1 - \beta_2)$ is the average change in log compensation between the highest paid director and the second highest paid director. In order to make the function convex, it should be observed that $\beta_2 \geq 0$ and $(\beta_1 - \beta_2) \geq \beta_2$ or that $(\beta_1 - 2\beta_2) \geq 0$. Lambert et al. (1993) argue that a convex function is used in their research so that compensation differences across adjacent organizational levels are non-decreasing. The ‘distance’ between organizational levels has a critical impact on whether the compensation function is convex or concave. In the sample data, the highest paid director, second highest paid director and third highest paid director occupy the top 3 hierarchical promotion positions in Chinese boards of directors. Thus I expect the function describing the compensation levels of the top 3 highest paid directors in the hierarchy to provide some insights into the incentive structure of Chinese listed companies.

8.3.1.1 Robust regression with standard errors clustered by firm

Table 8.2 Model 2: Executive pay, organizational levels and political influences

Regression results of the relationship between executive pay and organizational levels in Chinese listed companies.

The dependent variable in this table is the logarithm of executive compensation of the top 3 highest paid directors. Please see Appendix 2 for the definitions of independent variables. The regressions utilize robust regression with standard errors clustered by firm. Values of t-statistics are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Dependent	Model 2A	Model 2B	Model 2C
level1	0.152***	0.335***	0.125
level2	0.067	0.221***	0.040
LG1		-0.004***	-0.0002
LG2		-0.003***	0.0002
lgasset		0.286***	0.280***
board1			-0.011**
perindp1			0.486**
duality1			0.025
Party			0.026
Age			0.011
Agesq			-0.0001
Tenure			-0.042**
Tensq			0.005**
gender			-0.083**
roa1			0.021
state			-0.001
legal			-0.002
foreign			0.005*
location1			0.159***
yripo1			0.012
sdev1			0.002***
debt1			-0.068
Industry	No	Yes	Yes
Year	No	Yes	Yes
Constant	1.452***	-0.328	-0.344
Observations		779	758
R ²	0.043	0.318	0.446

Table 8.2 shows the robust regression results with standard errors clustered by firm. Model 2 tests: a. the relationship between executive compensation and organizational levels and b. how political influences affect the relationship between compensation and organization levels. Models 2A, 2B and 2C used the full sample of the individual top 3 highest paid directors which contains 779 executive directors in the 71 Chinese listed companies from 1998 to 2001. Model 2C contains 758 observations due to the missing values in control variables. Model 2A simply regressed the logarithm of executive compensation on organizational levels without any control variables. Model 2B regressed the logarithm of executive compensation on organizational levels and two interaction terms of government ownership after controlling for firm size, industry and year dummies. In addition to the variables in Model 2B, Model 2C added corporate governance variables, individual and firm characteristics and industry dummies as control variables to the regression. F tests show that all three models are significant at the 1% level of significance. Models 2A, 2B and 2C explain 4.3%, 31.8% and 44.6% of the total variance of executive compensation in Chinese listed companies respectively.

With regard to the relationship between executive compensation and organization levels, the regression results show that the coefficient for level 1 (the pay increase from the second highest paid director to the highest paid director) is greater than that for level 2 for all three models. However, the coefficients for both level 1 and level 2 are only significant in Model 2B. In model 2B, the estimated coefficients

for level 1 and level 2 are 0.335 and 0.221 respectively. The results indicate that the average cash compensation increases by 33.5% when a director is promoted from level 2 (the second highest paid director) to level 1 (the highest paid director). On the other hand, the average cash compensation increases by 11.4% ($\beta_1 - \beta_2$) when a director is promoted from level 3 (the third highest paid director) to level 2 (the second highest paid director). However, the magnitude of pay difference in Chinese companies is much smaller than that in Western companies. For example, Conyon et al. (2001) find that the average cash pay increases by approximately 60% when a divisional CEO is promoted to corporate CEO. Main et al. (1993) also find that CEOs enjoy a level of pay that is about 140% greater than the pay at the next reporting level down.

In model 1C, after controlling for firm and individual characteristics, the estimated coefficients for level 1, level 2 and two interaction terms all became insignificant. The results indicate that after controlling for firm and individual characteristics, organization levels became insignificant indicators for executive compensation in Chinese listed companies.

According to Lambert et al. (1993), for the relationship between executive compensation and organization levels to be convex, the coefficient estimated on level 2 (the second highest paid director) must be positive. In addition, the difference between the coefficients on level 1 (highest paid director) and level 2 (the second

highest paid director) must be greater than the coefficient on level 2. Model 2A and 2C do not satisfy this condition $(\beta_1 - 2\beta_2) \geq 0$ because of the insignificant coefficients for level 1 and level 2. Although both coefficients for level 1 and level 2 are significant in Model 2B, the coefficients do not satisfy the condition $(\beta_1 - 2\beta_2) \geq 0$. Therefore, the research hypothesis H2a (that in Chinese listed companies, the pay difference between the highest paid director and second highest paid director is bigger than the pay difference between second highest paid director and third highest paid director, however the pay difference is not big enough to make a convex relationship) is supported.

The coefficients of the two interaction terms in Model 2B are both significant and negative, which indicate that the higher the government ownership, the smaller the pay differences between organization levels. Therefore, the research hypothesis H2b (that higher state ownership would further reduce the pay difference between different levels) is supported.

In summary, the first research hypothesis that in Chinese listed companies, the pay difference between the highest paid director and second highest paid director is bigger than the pay difference between second highest paid director and third highest paid director, but the difference between the two is not big enough to make a convex relationship (H2a) and the second research hypothesis that higher state ownership would further reduce the pay difference between different levels (H2b) are both

generally supported in this study.

As for the control variables, there is no significant relationship found between firm performance and executive compensation. I have used both accounting return and market return measures and Tobin's Q as proxies for firm performance. The results are consistent for all three performance measures. This may well be explained in terms of executive pay having little to do with the absolute performance of the firm, as found in previous studies (Firth et al. 2006). Moreover, as the research findings show, executive pay is related to individual director characteristics. First, both tenure (negative sign) and tenure square (positive sign) are significantly related to executive pay at the 5% level of significance, which suggests a U-shaped relationship between tenure and executive compensation. The results suggest that as tenure increases, the compensation decreases first until tenure reaches 2 years and then increases again after 2 years' tenure. Li et al. (2007) also find a positive relation between CEO tenure and compensation. However, they did not include tenure square in their models and therefore were unable to test whether there is a non-linear relation between CEO tenure and compensation. Second, gender has a negative relation with executive pay at the 5% significance level, which means female directors are paid 8.3% less in Chinese listed companies.

Firm size and board characteristics variables explain a large variance in executive pay in Chinese listed companies. First, executive pay is positively related to a firm's

total assets at the 1% significance level. A 1% increase in firm total assets will yield an average of 28% increase in executive compensation, which is consistent with previous empirical studies (Laing and Weir, 1999; Tosi et al., 2000; Zhou, 2000). Second, executive pay is significantly related to board size and the percentage of independent directors: the addition of each director to the board will result in a 1.1% decrease in executive compensation (1% sig. level). On the other hand, a 1% increase in independent directors on the board will result in a 0.486% increase in executive compensation (1% sig. level). Third, executive compensation is not significantly related to CEO/Chairman duality, which indicates that executives are not paid more when the CEO and Chairman is the same person in Chinese listed companies.

Ownership variables do not bring a significant increase to the explanatory power of Model 2. Executive compensation is only positively related to foreign ownership (10% sig. level). Executive compensation is positively related to company location (1% sig. level) and business risk (proxied by the standard deviation of market return, 1% sig. level), which means the directors are paid more in Beijing, Shanghai or south east coastal cities and in companies with higher business risks.

Model 2 focuses on the relation between executive compensation and organization levels. Further detailed analysis on executive compensation and board characteristics and individual and firm characteristics will be conducted in a simultaneous model in section 4 in this chapter.

8.3.1.2 Regression diagnosis and robustness checks

8.3.1.2.1 Regression diagnosis

As discussed in chapter 7, one extreme outlier was detected for both return on assets (ROA) and earnings per share (EPS). The regression results of Model 2C remained consistent after deleting this extreme outlier, except that the coefficient of ROA became less significant. A few other outliers were detected using leverage versus the residual squared plot after the regression. The regression results remained consistent and robust for model 1C. The adjusted R square of Model 2C only changed slightly. Therefore the outliers are not deleted in model 2C.

As discussed in chapter 7, state, legal and foreign ownership variables have skewed distribution. Due to the large numbers of zero values in the state, legal person and foreign ownership data, the 3 ownership variables were recoded as dummy variables instead of using logarithm transformation. The regression results remained robust and consistent after having been changed.

The variance inflation factors (VIF) of the independent variables were checked for both models 2B and 2C to test the problem of multicollinearity. The VIFs for model 1B are all less than 2 after deleting the two interaction terms (because of the functional relationship between levels and the two interaction terms). The VIFs for model 2C are all less than 4 after deleting the two interaction terms, Agesq (age

square) and Tensq (tenure square). The VIFs results indicate that multicollinearity does not pose a serious problem for either model.

Model specifications were checked by the Ramsey RESET test. Model 2B's test result is $F(3, 758)=0.62$, Prob. > F = 0.6005. Model 2C's test result is $F(3, 721) = 0.53$, Prob. > F = 0.6594. Therefore the null hypotheses that the models have no omitted variables and are correctly specified cannot be rejected for either of the models.

8.3.1.2.2 Robustness checks

According to Petersen (2009), to solve the problem of possible biased OLS standard errors in panel data, Model 2 was examined by both OLS and robust regression with standard errors clustered by firm. It was found that the OLS standard errors were mostly underestimated compared to robust standard errors clustered by firm, which suggests that OLS standard errors are biased estimations. Therefore, robust regression with standard errors clustered by firm was used to test hypothesis 2. Year dummies were included in the regression to control the effect of time. Panel data analysis could not be conducted in this model because two organization level variables were collinear with the panel variable company number. The key regressors in Model 2 were two dummy variables: level 1 and level 2, which are not affected by the endogeneity problem.

Further robustness checks for Model 2C were done according to the following steps:

1. The performance measure return on assets was replaced by earnings per share, lagged return on assets and lagged earnings per share; 2. the firm size measure logarithm of total assets was replaced by logarithm of sales; 3. the percentage of independent directors was replaced by the percentage of non-executive (unpaid and non-independent) directors; 4. Debt/equity ratio was replaced by debt/total assets ratio; 6. Ownership variables were coded as dummy variables. The results remained robust and consistent after the replacement, although the R square, the significance level and magnitude of coefficients changed slightly.

8.3.2 Model 3 Executive pay differences and number of contestants (Hypothesis 3)

The tournament theory predicts that the reward for winning the game for a director (that is, to become the CEO/highest paid director) increases as the number of contestants (number of executive directors) increases. In other words, the tournament theory predicts that the larger the number of executive directors (contestants), the greater the difference between the CEO's/highest paid director's and average executive directors' compensation levels. In this study, it is hypothesized that the relationship between executive pay gap and the number of contestants is weak in Chinese listed companies (H3a) and that higher state ownership would further weaken the relationship (H3b).

According to Main et al. (1993), Eriksson (1999) and Conyon et al. (2001), Model 3 takes the following form:

$$WD = \beta_0 + \beta_1(Con) + \beta_2 Con * gov + control + \varepsilon \quad (8.3)$$

where WD = the reward for becoming the CEO/highest paid director in a Chinese listed company (i.e. the wage difference between the CEO/highest paid director and the average pay of contestants);

$$WD = \text{Log}(W_1) - \text{Log}(W_A)$$

W_1 = cash compensation of the highest paid director in Chinese listed companies;

W_A = the average cash compensation received by the contestants, which is the average cash compensation received by the executive team, except for the highest paid director in Chinese listed companies;

Con = the number of contestants, which is the number of non-CEO/highest paid executive directors in Chinese listed companies;

gov = the subtotal of state ownership and legal person ownership. Gov is used as a proxy to government ownership according to Sun et al. (2002).

control = control variables, including firm size, corporate governance mechanisms, individual and firm characteristics, year dummies and industry dummies (control for macroeconomic and industry effects); corporate governance variables include board size, percentage of independent directors, CEO/chairman duality, CEO/deputy chairman duality and debt to equity ratio. Individual characteristics include age,

tenure and gender of executive directors. Firm characteristics include firm size, firm age, ownership structure, firm risk, Tobin's Q, and company location

ε = estimation error.

8.3.2.1 Regression results

Table 8.3 Model 2: Executive pay gap and the number of contestants

This table shows the regression results of the relationship between executive pay gap and the number of contestants in Chinese listed companies.

The dependent variable in this table is the pay gap between the highest paid director and the average contestant. Please see Appendix 2 for the definitions of independent variables. Model 3A utilizes robust regression with standard errors clustered by firm, and values of robust t-statistics are in parentheses. Model 3B utilizes the random-effects method, and values of z-statistics are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Dependent Variable:	Model 3A	Model 3B
con	-0.0006	0.006
CG	0.0002	4.57E-05
lgasset	-0.009	0.003
board1	-0.001	-0.007
perindp1	-0.122	-0.115
duality1	-0.003	0.005
duality21	0.029	0.022
Age	-0.019*	-0.007
Agesq	0.0002*	6.94E-05
Tenure	-0.01	-0.008
Tensq	0.002	0.002
gender	0.153***	0.133***
state	-0.0008	-0.0003
legal	-0.002	-0.001
foreign	0.0003	0.0005
location1	0.066***	0.072**
yripo1	-0.006	-0.007
sdev1	-0.0003	-0.0004
debt1	-0.009	0.008
Industry	Yes	Yes
Year	Yes	Yes
Constant	0.628**	0.360
Observations	252	253
R^2	0.235	0.217
R^2 within		0.120
R^2 between		0.314

The data used in Model 3A contains 252 pay difference observations in the 71 Chinese listed companies between 1998 and 2001. Table 8.3.1 reports the regression results of the relationship between executive pay differences and the number of contestants by using both robust regression (with standard errors clustered by firm) and random effects GLS regression.⁹ The dependent variables for both models are the logarithm differences between the compensation of the highest paid director and the average pay of the rest of the executive board. Model 3A is significant at the 1% level of significance. Model 3B is significant at the 5% level of significance. Model 3A explains 23.5% of the total variances of pay differences between the highest paid director and average executive directors' pay. Model 3B was run by panel data analysis. The random effects GLS regression results show that within-firm heterogeneity can explain 12% of the total variance of the executive pay gap. The between-firm heterogeneity can explain 31.4% of the total variance of the executive pay gap. The proportion of the total variance of the residuals contributed by the firm-level variance component is 35% ($\rho = 0.35$).

Both model 3A and 3B failed to detect a significant relationship between executive pay gap and number of contestants. The interaction term, which captures the political influence (gov) on the relationship between executive pay gap and number of contestants, is not significant in either model. Therefore, there is no evidence to support the research hypothesis that the relationship between the executive pay gap

⁹ The regression diagnosis and robustness checks are in section 8.3.2.2.

and the number of contestants is weak in Chinese listed companies (H3a) and that higher state ownership would further weaken the relationship (H3b).

For the control variables, age is negatively related to the executive pay gap in model 3A (10% sig. level), which suggests that the pay gap is 1.9% smaller if the highest paid director (HPD) is 1 year older. The gender of the HPD is positively related to the executive pay gap in both models (1% sig. level), which suggests that the pay gap is 14.95% larger when the HPD is a female. Company location is positively related to the pay gap (1% sig. level in model 3A and 5% sig. level in model 3B), which shows that executive compensation increases further by approximately 7% if the company is located in economically more developed areas like Beijing, Shanghai or southeastern coastal cities.

8.3.2.2 Regression diagnosis and robustness checks

8.3.2.2.1 Regression diagnosis

A few outliers were detected using leverage versus residual squared plot. The adjusted R square was not improved after one extreme outlier (4 firm/year observations) was removed. This shows that the outliers may represent important information about the relationship between variables. Therefore the outliers in the sample were kept and the data remained unchanged.

As discussed in chapter 7, state, legal and foreign ownership variables have skewed distribution. Due to the large numbers of zero values in the state, legal person and foreign ownership data, the 3 ownership variables were recoded as dummy variables instead of using logarithm transformation. The regression results remained robust and consistent after having been changed.

Variance inflation factors (VIF) of the independent variables were checked to find out whether the problem of multicollinearity could be detected. The VIFs in model 3A are all less than 4 except for CG (con*gov), Agesq (age square) and Tensq (tenure square) because of the functional relationship between con and CG, age and age square, and tenure and tenure square. Model 2 was re-run after removing CG, Agesq and Tensq and the regression results remain consistent. The VIFs of the new model are all less than 4, which indicate that there is no problem of multicollinearity within the independent variables in model 3.

8.3.2.2.2 Robustness checks

To solve the problem of possible biased OLS standard errors in panel data, model 3 was examined by both OLS and robust regression, with standard errors clustered by firm. It is found that the OLS standard errors were biased compared to the robust regression with standard errors clustered by firm. Therefore robust regression with standard errors clustered by firm was used to test hypothesis 3. Year dummies were

included in the regression to control the effect of time.

Model 3 was also tested by using panel data techniques to control the unobserved firm heterogeneity. The Hausman specification test was used to check whether a fixed effects model or a random effects model is both consistent and efficient (Greene, 2003). The Hausman test results show that the random effects model is both consistent and efficient ($\text{Chi}^2(18) = 13.67$, $\text{Prob.} > \chi^2 = 0.7503$), therefore a random effects model is chosen.

Model 3A was examined by the Ramsey RESET test for model specifications. The model 3A test result is $F(3, 218) = 13.51$, $\text{Prob.} > F = 0$. The null hypotheses that the models have no omitted variables can be rejected and therefore there could be omitted variables or mis-specification of the model. The omitted variables can cause the endogeneity problem. In addition, the causality of executive pay dispersion and number of contestants is unclear (Errikson, 1999). To address the possible problem of endogeneity, a two-stage least-square (2SLS) method was used to check the problem of endogeneity and whether the robust regression (with standard errors clustered by firm) and random effects model estimates are consistent and unbiased.

In the 2SLS model, tenure was used as the instrumental variable (IV) because 1. tenure is correlated with the endogenous variable number of contestants (con) because as the executive stays longer in his/her position, he/she would want to make the pool of contestants smaller in order to make his/her position safer; 2. tenure would not

correlate with executive pay dispersion. Regression results confirm that tenure has a significant and negative relationship with the number of contestants (1% sig. level). The Hausman test was used to examine whether the robust regression estimates are consistent with the instrumental variables regression (2SLS). The Hausman test result ($\text{Chi2}(26) = 3.48$, $\text{Prob} > \text{chi2} = 1$) shows that robust regression (with standard errors clustered by firm - model 3A) estimates are consistent with the instrumental variables regression (2SLS). The random-effects model (3B) was also examined by the Hausman test, the rest result ($\text{Chi2}(26) = 0.51$, $\text{Prob} > \text{chi2} = 1$), suggesting that the random effects model estimates are also consistent with the instrumental variables regression and are therefore unbiased.

Further robustness checks for both models were done by the following steps: 1. the firm size measure logarithm of total assets was replaced by logarithm of sales; 2. the percentage of independent directors was replaced by the percentage of non-executive directors; 3. debt/equity ratio was replaced by debt/total assets ratio; 4. ownership variables were recoded to dummy variables. The results remained consistent after these changes except for the R square, the significance level and magnitude of coefficients changed slightly.

8.3.3 Model 4: Executive pay dispersion and firm performance (Hypothesis 4)

Hypotheses 2a, 2b, 2c, 3a and 2b describe what kind of pay structures exist in

corporate hierarchy, but do not discuss whether the pay structure can work as an incentives mechanism for top managers (Eriksson, 1999). Tournament theory predicts that corporate performance is positively related with the executive pay gap. In this study, it is hypothesized that corporate performance is positively related with the executive pay gap in less government-controlled Chinese listed companies (H4). Model 4 tests the relationship between pay gap and firm performance in Chinese listed companies. According to Main et al. (1993), Eriksson (1999) and Conyon et al. (2001), the regression equation is as follows¹⁰:

$$P = \beta_0 + \beta_1(Pay_D) + \beta_2(Pay_D * gov) + control + \varepsilon \quad (8.4)$$

where P = firm performance of Chinese listed companies. Three measures of firm performance are used: 1. return on assets, 2. earnings per share and 3. Tobin's Q;

Pay_D = executive pay dispersion, according to Eriksson (1999), two measures of pay dispersion are used: 1. WD (highest paid director – contestants' pay differences); 2. executive pay variation (coefficient of variance of executive pay);

where WD is the reward for becoming the CEO/highest paid director in Chinese listed companies (i.e. the wage difference between the CEO/highest paid director and the average pay of contestants);

$$WD = \text{Log}(W_1) - \text{Log}(W_A)$$

$$CVW = (W_1 - W_E) / W_E$$

W_1 = cash compensation of the highest paid director in Chinese listed companies;

¹⁰ As the proxies for the degree of interdependence of executive team members are not available(as in Main et al. 1993; Eriksson, 1999), it is not included in the regression model.

W_A = the average cash compensation received by the contestants, which is the average cash compensation received by the executive team except the highest paid director in Chinese listed companies;

W_E = the average cash compensation of executive directors;

gov = the subtotal of state ownership and legal person ownership. Gov is used as a proxy to government ownership according to Sun et al. (2002).

control = control variables, including the average pay of the top executive team, corporate governance variables, firm size, firm characteristics, industry and year dummies;

ε = estimation error.

8.3.3.1 Regression results

Table 8.4a Model 4: Executive pay dispersion (WD) and firm performance

This table shows the regression results of the relationship between executive pay dispersion (WD) and firm performance in Chinese listed companies.

The dependent variable in this table is firm performance, measured by return on assets, earnings per share and Tobin's Q. Please see Appendix 2 for the definitions of independent variables. Models 4A, 4B, and 4C utilize robust regression with standard errors clustered by firm. For models 4A, 4B and 4C, values of robust t-statistics are in parentheses. Model 4D utilizes the random-effects method. Model 4E and 4F utilize the fixed-effect method. For model 4D, values of z-statistics are in parentheses. For models 4E and 4F, values of t-statistics are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Model 4A	Model 4B	Model 4C
Dependent	roa	eps	Tobin's Q
WD	0.167	0.262	1.016
WG	-0.002	-0.0004	-0.013
lgWA	0.0002	0.023	0.009
lgasset	0.075***	0.423***	-0.784***
board1	-0.0008	-0.004	-0.015
perindp1	-0.076	-0.945***	0.085
duality1	-0.002	-0.017	0.044
duality21	-0.016	-0.079	-0.114
state	2.72E-05	0.0001	-0.001
legal	1.51E-05	-0.0003	0.0001
foreign	-0.002**	-0.008	-0.007*
location1	0.001	0.023	0.0001
yripol	-0.006**	-0.038**	0.011
sdev1	-5.8E-05	-0.001	-0.001
debt1	-0.146***	-0.623***	-0.255
Industry	Yes	Yes	Yes
Year	Yes	Yes	Yes
Constant	-0.323**	-1.952***	6.314***
Observations	252	252	252
R ²	0.465	0.498	0.580

	Model 4D	Model 4E	Model 4F
Dependent	roa	eps	Tobin's Q
WD	0.198*	0.857*	1.944***
WG	-0.002	-0.011	-0.034***
lgWA	-0.001	-0.001	-0.163
lgasset	0.076***	0.601***	-1.586***
board1	-0.001	-0.009	0.020
perindp1	-0.047	0.273	0.115
duality1	0.0002	-0.027	0.072
duality21	-0.015	-0.044	-0.077
state	0.0001	0.0003	0.006
legal	0.0001	-0.0002	0.005
foreign	-0.002**	(dropped)	(dropped)
location1	0.003	(dropped)	(dropped)
yripo1	-0.007**	-0.100***	0.157***
sdev1	0.00001	0.0005	0.001
debt1	-0.140***	-0.491***	0.100
Industry	Yes	Yes	Yes
Year	Yes	Yes	Yes
Constant	-0.327***	-2.80***	10.068***
Observations	252	252	252
R^2 overall	0.463	0.333	0.412
R^2 within	0.248	0.277	0.550
R^2 between	0.659	0.352	0.426

The data used in Model 4 contains 252 pay difference observations in 68 Chinese listed companies between 1998 and 2001. Table 8.4a reports the estimates of the relationship between executive pay differences (measured by WD) and firm performance.¹¹ The dependent variables are three measures of firm performance: return on assets, earnings per share and Tobin's Q. All the models are significant at the 1% level of significance. By using robust regression with standard errors clustered by firm, model 4A, 4B and 4C explain 46.5%, 49.8% and 58% of the total variances of firm performance respectively.

¹¹ Regression diagnosis and robustness check are in section 8.3.3.2.

Models 4D, 4E and 4F were tested using panel data analysis. The fixed-effects regression results show that in model 4D, within-firm heterogeneity can explain 24.8% of the total variance of ROA. The between-firm heterogeneity can explain 65.9% of the total variance of ROA. In model 4E, within-firm heterogeneity can explain 27.7% of the total variance in EPS. The between-firm heterogeneity can explain 35.2% of the total variance of EPS. In model 4F, within-firm heterogeneity can explain 55% of the total variance of the firm value (Tobin's Q). The between-firm heterogeneity can explain 42.6% of the total variance of the firm value (Tobin's Q).

Model 4F shows that after controlling for the average level of executive pay, firm characteristics and industry effects, there is a significant and positive relationship between executive pay differences (WD) and firm value (Tobin's Q) at the 1% significance level, which indicates that a 1% increase in executive pay differences would result in a 1.944% increase in firm value. The result indicates that executive pay difference works as an effective incentive to improve firm value in Chinese listed companies.

In addition, model 4F shows that the interaction term WG (WD*gov) has a significant and negative relationship with firm value, which suggests that the relationship between executive pay differences and firm value is weaker in more government-controlled companies. As discussed in chapter 3, the tournament prize includes both cash reward and political reward in Chinese listed companies. The

empirical results support the hypothesis that although cash compensation works as an effective incentive to improve firm value in Chinese listed companies, this cash incentive is weakened in more government-controlled companies because of the stronger political incentive in these companies.

Finally, both executive pay differences (WD) and the interaction term WG are not significant in model 4A, 4B and 4C. WD is weakly related to ROA and EPS in model 4D and 4E. The weak relationships between WD and ROA might be due to the fact that ROA is subject to management discretion (Chen et al., 1998). The weak relationship between WD and EPS might be explained by the fact that the state-owned shares in the Chinese stock market are non-tradable (Guo and Jiang, 2003); therefore EPS cannot truly reflect the performance of Chinese listed companies.

Table 8.4b Model 4: Executive pay dispersion (CVW) and firm performance

This table shows the regression results of the relationship between executive pay dispersion (CVW) and firm performance in Chinese listed companies.

The dependent variable in this table is firm performance, measured by return on assets, earnings per share and Tobin's Q. Please see Appendix 2 for the definitions of independent variables. Models 4G, 4H, and 4I utilize robust regression with standard errors clustered by firm. For models 4G, 4H and 4I, values of robust t-statistics are in parentheses. Models 4J and 4L utilize the random-effects method. Model 4K utilizes the fixed-effect method. For models 4J and 4L, values of z-statistics are in parentheses. For model 4K, values of t-statistics are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Model 4G	Model 4H	Model 4I
Dependent	roa	eps	Tobin's Q
CVW	0.538	2.479	-0.522
WG	-0.006	-0.026	0.037
lgWA	-0.013	-0.034	-0.069
lgasset	0.073***	0.411***	-0.808***
board1	-0.002	-0.008	-0.019
perindp1	-0.031	-0.707**	0.282
duality1	-0.003	-0.008	0.023
duality21	-0.015	-0.052	-0.122*
state	-0.0001	-0.0001	-0.004**
legal	-0.0001	-0.0002	-0.003
foreign	-0.002*	-0.011	-0.008
location1	0.011	0.076	0.028
yripo1	-0.005*	-0.034**	0.014
sdev1	0.00004	-0.0005	-0.001
debt1	-0.132***	-0.531***	-0.278
Industry	Yes	Yes	Yes
Year	Yes	Yes	Yes
Constant	-0.280**	-1.810**	6.791***
Observations	252	252	252
R ²	0.417	0.415	0.590

	Model 4J	Model 4K	Model 4L
Dependent	roa	eps	Tobin's Q
CVW	0.570	3.483**	0.718
WG	-0.007	-0.050	0.015
lgWA	-0.015	-0.151	-0.086
lgasset	0.074***	0.550***	-0.969***
board1	-0.002	-0.011	0.001
perindp1	-0.001	0.521	0.268
duality1	-0.002	-0.010	0.007
duality21	-0.016	-0.067	-0.095
state	-0.0001	0.002	-0.002
legal	-0.0001	0.002	-0.001
foreign	-0.002***	(dropped)	-0.008
location1	0.011	(dropped)	0.051
yripo1	-0.006*	-0.079***	0.017
sdev1	0.0001	0.001	0.0004
debt1	-0.125***	-0.384***	-0.182
Industry	Yes	Yes	Yes
Year	Yes	Yes	Yes
Constant	-0.280***	-2.424***	7.429***
Observations	252	252	252
R ² overall	0.415	0.254	0.574
R ² within	0.197	0.211	0.500
R ² between	0.648	0.307	0.630

Table 8.4b shows the regression results of the relationship between executive pay differences (measured by CVW) and firm performance. The second measure of pay gap - the coefficient of variation of executive pay (CVW) - was used in models 4G to 4L. CVW has a positive relationship with EPS (5% sig. level) and is not significant in other models. The interaction term (CVG) is not significant in all models.

Overall, significant positive relationships between pay gap (measured by WD) and firm performance were only found in fixed-effects or random-effects models (4D, 4E, 4F and 4K). These random-effects or fixed-effects model results show that a large

fraction of the variations in firm performance are explained by unobserved firm heterogeneity. In addition, the relationship between pay dispersion (measured by WD) and firm value becomes weaker when the company is more government-controlled. In other words, corporate performance (measured by Tobin's Q) is positively related with the executive pay dispersion (measured by WD) (H4a), and the relationship is stronger in less government-controlled Chinese listed companies (H4b).

8.3.3.2 Regression diagnosis and robustness checks

8.3.3.2.1 Regression diagnosis

Models 4A, 4B, 4C, 4G, 4H and 4I were originally tested using OLS regression. As discussed in chapter 7, for the return on assets and earnings per share, one extreme outlier was detected for both variables. A few outliers were detected using a leverage versus residual squared plot after the OLS regression, including the extreme outlier of return on assets and earnings per share. After deleting the extreme outlier, the adjusted R square was improved from 31% to 40% and the probability of the coefficient of WD equaling zero was improved from 0.2 to 0.03. The other extreme outlier (4 firm/year observations) was also deleted and after removing it, the adjusted R square of the models only improved slightly, which implies that the outliers may represent important information about the relationship between variables. Therefore I removed the first outlier and kept the second outlier unchanged.

As discussed in chapter 7, state, legal and foreign ownership variables have skewed distribution. Due to the large numbers of zero values in the state, legal person and foreign ownership data, the 3 ownership variables were recoded as dummy variables instead of using logarithm transformation. The regression results remained robust and consistent after the changes to all the models. Executive pay dispersion (CVW) was also skewed and rather peaked. Logarithm transformation was used to reduce the problem of non-normality. The regression results remained robust and consistent after the logarithm transformation.

The problem of multicollinearity was checked by calculating the variance inflation factors (VIF) of the independent variables for all three models. The VIFs in model 3 are all less than 4, which indicates that there is no problem of multicollinearity within the independent variables.

8.3.3.2.2 Robustness checks

To solve the problem of possible biased OLS standard errors in panel data, model 4 was examined by both OLS and robust regression with standard errors clustered by firm. It was found that the OLS standard errors were biased compared to robust regression with standard errors clustered by firm. Therefore, robust regression with standard errors clustered by firm was used to test hypothesis 4. Year dummies were included in the regression to control the effect of time.

Models 4A, 4B, 4C, 4G, 4H and 4I were examined by the Ramsey RESET test for model specifications. The test results for models 3A-3F are 3A: $F(3, 222) = 0.74$, Prob. $> F = 0.5296$; 3B: $F(3, 222) = 12.14$, Prob. $> F = 0$; 3C: $F(3, 222) = 35.13$, Prob. $> F = 0$; 3D: $F(3, 246) = 1.08$, Prob. $> F = 0.3570$; 3E: $F(3, 246) = 2.82$, Prob. $> F = 0.0395$; and 3F: $F(3, 246) = 32.88$, Prob. $> F = 0$ respectively. The null hypotheses that the models have no omitted variables cannot be rejected for models 4A and 4G and can be rejected for models 4B, 4C, 4H and 4I. Therefore, there could be omitted variables or mis-specification of models 4B, 4C, 4H and 4I. Model 4 was also estimated by using panel data techniques which control for firm heterogeneity and are more efficient. The Hausman specification test was used to check whether a fixed effects model or a random effects model is both consistent and efficient (Greene, 2003). The test results show that the random-effects model is both consistent and efficient for models 4A, 4G and 4I; the fixed-effects models are both consistent and efficient for models 4B and 4H, therefore random-effects models are estimated for models 4A, 4G and 4I and fixed-effects models are chosen for models 4B and 4H.

The omitted variables can cause the endogeneity problem. Although the fixed-effects model can alleviate the endogeneity problem, it cannot solve the problem. In addition, the direction of causality between the executive pay gap and firm performance is unclear. It could be that the higher pay gap acts as an incentive mechanism, therefore improving firm performance or better performing companies tend to compensate their CEOs more than his/her subordinates. To address the

possible problem of endogeneity, a two-stage least-square (2SLS) method was used to check the problem of endogeneity and whether robust regression (with standard errors clustered by firm) and fixed or random-effects model estimates are consistent and unbiased.

In the 2SLS model, location, industry, year dummies, ownership and years of IPO (yr ipo) were used as the instrumental variable (IV) because 1. location is correlated with the endogenous variable executive pay dispersion (WD) because WD tends to be higher in more developed areas in China such as Beijing, Shanghai or southeastern coastal cities; 2. location would not correlate with firm performance. Industry, year dummies, ownership and years of IPO (yr ipo) would also be correlated with WD but uncorrelated with firm performance. After running a regression of WD on these IVs, the F ratio is significant at the 1% level of significance, which suggests that the coefficients of these IVs are not equal to zero at the same time at the 1% significance level. The Hausman test was used to examine whether the robust regressions (with standard errors clustered by firm) and fixed or random-effects models estimates are consistent with the instrumental variables regression (2SLS). The Hausman test result for models 4A, 4B and 4C are ($\text{Chi}^2(10) = 0.07$, $\text{Prob} > \text{chi}^2 = 1$), ($\text{Chi}^2(10) = 0.00$, $\text{Prob} > \text{chi}^2 = 1$) and ($\text{Chi}^2(10) = 0.00$, $\text{Prob} > \text{chi}^2 = 1$) respectively. The test results show that robust regression (with standard errors clustered by firm) estimates are consistent with the instrumental variables regression (2SLS). The fixed or random-effects models (4D, 4E and 4F) were also examined by the Hausman test. The

test results ($\text{Chi2}(10) = 0.4$, $\text{Prob}>\text{chi2} = 1.000$), ($\text{Chi2}(9) = 0.58$, $\text{Prob}>\text{chi2} = 0.9999$), ($\text{Chi2}(9) = 0.07$, $\text{Prob}>\text{chi2} = 1.000$) suggest that the fixed or random-effects model estimates are also consistent with the instrumental variables regression and therefore unbiased. The Hausman test results for Model 4G to 4L produced similar results, which suggest that robust clustered regression fixed model or random-effects model estimates are consistent with the instrumental variables regression.

Robustness checks for all the models were conducted according to the following steps: 1. the firm size measure logarithm of total assets was replaced by logarithm of sales; 2. the percentage of independent directors was replaced by the percentage of non-executive directors; 3. the debt/equity ratio was replaced by the debt/total assets ratio; 4. ownership variables were coded to dummy variables. The results remain consistent after these changes except that the R square, significance level and magnitude of coefficients change slightly.

8.4 A Simultaneous Model of Executive Compensation, Executive Ownership and Board Characteristics (Hypothesis 5)

Hypothesis 5 states that executive compensation, managerial ownership, board characteristics and firm value are jointly determined in Chinese listed companies. Hypothesis 5 is examined by using a simultaneous model. In the simultaneous equation system, I extended Chung and Pruitt's (1996) model by adding 4 board

characteristic variables (board size, board duality which includes both CEO/Chair and CEO/Deputy Chair duality, board composition and executive political power) as endogenous variables in the simultaneous model.

There are 5 equations and 7 endogenous variables, which are: 1.executive compensation (hpdtot); 2.executive ownership (hpdown); 3.board size (board); 4.board leadership structure (duality which includes both CEO/Chair and CEO/Deputy Chair duality); 5.board composition (perindp); 6.executive political power (party); and 7.Tobin's Q. There are 16 instrumental or exogenous variables, which are age, agesq, tenure, tensq, gender, perned (percentage of non-executive directors), lgsales/assets(firm size), lgmveq (market value of equity), stateown, legalown, foreignown, location, yripo(company age), sdev (firm business risk), roa/eps and debt (leverage ratio).

To estimate the equations empirically, a three-stage least-squares (3SLS) model was employed. As discussed in chapter 5, 3SLS goes one step further than 2SLS by using the two-stage least squares estimated moment matrix of the structural disturbances to estimate all coefficients of the entire system simultaneously (Zellner and Theil, 1962). Therefore, 3SLS is a more precise and more efficient approach than 2SLS. The order and rank conditions were checked to make equations (1)-(5) identified. According to Agrawal and Knoeber (1996), Chung and Pruitt (1996) and Mak and Li (2001), the development of equations (1)-(5) is partly motivated by the need for these equations

to be identified. As Mak and Li (2001) suggest, although the determination of the exogenous variables to be included or excluded in each equation relies on theory or previous research as far as possible, the results obtained may be sensitive to which exogenous variables are included.

The first equation relates to HPD cash compensation. According to the managerial power theory, executive compensation is related to executive ownership power (hpdown) and political power (party). According to human capital theory, executive compensation is influenced by a director's personal characteristics such as age, tenure and gender. Age square and tenure square were also included in the equation for the possible non-linear relationship between age, tenure and compensation. Previous literature (Crystal, 1991; Lambert et al., 1993; Boyd, 1994; Core et al., 1999) also suggests that board characteristics are related to CEO compensation. Therefore, board size (board), board composition (perindp) and board leadership structure (duality) were all included. Firm size (lgasset) and company location are both important indicators of executive compensation, therefore both were included in equation (1) as well.

$$(1) \text{Hpdtot} = f(\text{hpdown}, \text{perindp}, \text{board}, \text{duality}, \text{party}, \text{age}, \text{agesq}, \text{tenure}, \text{tensq}, \text{gender}, \text{lgasset}, \text{stateown}, \text{legalown}, \text{foreignown}, \text{location}).$$

The second equation relates to HPD ownership. HPD ownership was measured by the percentage of shares held by the HPD. According to Agrawal and Knoeber (1996), Chung and Pruitt (1996) and Mak and Li (2001), Tobin's Q, board characteristics (perindp, board, duality), HPD age and tenure, market value of equity (lgmveq), ownership (stateown, legalown, foreignown), firm risk (sdev) and company age (yripo) were all included in equation (2). A new explanatory variable - HPD political power (party) – was also included to fit with the Chinese context. It is expected that HPD ownership could be positively related to political power.

$$(2) \text{Hpdown} = f(\text{Tobin's Q, perindp, board, duality, party, age, agesq, tenure, tensq, lgmveq, stateown, legalown, foreignown, yripo, sdev});$$

The third equation relates to the percentage of independent directors. According to Agrawal and Knoeber (1996) and Mak and Li (2001), HPD ownership (hpdown), board characteristics (board, duality) and ownership (stateown, legalown, foreignown) were included in equation (3). Party and yripo were also included to examine if HPD political power and company age have any influence over the percentage of independent directors in Chinese listed companies.

$$(3) \text{Perindp} = f(\text{hpdown, board, duality, party, stateown, legalown, foreignown, yripo});$$

The fourth equation relates to board size. According to Mak and Li (2001), HPD ownership, board characteristics (perindp, duality), ownership (stateown, legalown, foreignown), firm size (lgasset) and company age (yrpo) were all included in equation (4). Party was also included to examine if HPD political power has any effect on board size in Chinese listed companies.

$$(4) \text{ Board} = f(\text{hpdown}, \text{perindp}, \text{duality}, \text{party}, \text{lgasset}, \text{stateown}, \text{legalown}, \text{foreignown}, \text{yrpo});$$

The fifth equation relates to firm value which is measured by Tobin's Q. Jensen and Meckling (1976) and Mehran (1995) propose that executive compensation structure, ownership structure and board composition are jointly determined, these variables also influencing firm performance. Since Chinese listed companies only disclose cash compensation in their annual reports, HPD cash compensation was included in equation (5). Board characteristic variables (perindp, board, duality) and ownership variables (stateown, legalown, foreignown) were also included. According to Agrawal and Knoeber (1996) and Himmelberg et al. (1999), hpdown and hpdown2 (hpdown square) were both included to allow nonlinearities. Hpdown3 (hpdown cube) was not included because in regressions of Tobin's Q against HPD ownership, I could not detect any obvious turning points in the relationship. According to Agrawal and Knoeber (1996) and Chung and Pruitt (1996), company age (yrpo), firm risk (sdev) and leverage ratio (debt) were all included in equation (5). Lastly, to fit with the

Chinese context, a new explanatory variable - HPD political power (party) - was also included to examine if HPD's political power has any influence on firm value.

(5) Tobin's $Q = f(\text{hpdtot}, \text{hpdown}, \text{hpdown2}, \text{perindp}, \text{board}, \text{duality}, \text{party}, \text{stateown}, \text{legalown}, \text{foreignown}, \text{yripo}, \text{sdev}, \text{debt})$.

8.4.1 Three-stage least squares (3SLS) regression results (Model 5)

Table 8.5 Model 5: Simultaneous model of executive compensation, executive ownership and board characteristics

This table shows the results of three-stage least squares (3SLS) regressions of HPD compensation, HPD ownership and board characteristics in Chinese listed companies.

Please see Appendix 2 for the definitions of variables. Values of z-statistics are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	lghpdtot	hpdown	perindp	board	Tobin's Q
hpdown	1534.747***		58.844	-5091.508**	8636.213
hpdown2					-23900000*
dual2	-1.549**	-0.001	0.047	4.486	-2.242
perindp	-6.551	0.009***		-27.044	21.727**
perned					1.032
board	0.175**	-0.0002***	0.015***		-1.217***
party1	0.929**	-0.0002	0.001	-4.119**	-1.166
hpdage	-0.013	0.000002			
hpdagesq	0.000	-0.000			
hpdtenure	-0.123*	0.00001			
hpdtensq	0.020**	0.000002			
hpdgender	1.102*	-0.00001			
lgtotasset	-0.333			4.607***	1.249
stateown	-0.005	0.000004*	-0.0004	-0.002	0.013
legalown	-0.007*	0.000001	-0.0002	-0.010	-0.004
foreignown	0.012	0.000004	-0.001	-0.096	-0.018
location	0.222**				
roa	-0.944				
sdev	0.001	-0.0000004			
yripo		-0.0001***	0.008***	-0.013	-0.306
lgamveq		0.00001			
Tobin's Q		-0.0002			
Debt					0.592
constant	2.780*	0.003	-0.162***	-16.489*	9.126
Observations	275	275	275	275	275
SW R^2	-9.334	-66.939	-0.241	-0.956	-33.448
SW MSE	0.968	0.001	0.074	3.684	3.149
P-value	0.009	0.000	0.027	0.000	0.000

The dataset used in model 5 contains 275 individual HPDs in Chinese listed companies between 1998 and 2001. Table 8.5 shows the three-stage least squares regression results of HPD compensation (hpdtot), HPD ownership (hpdown), board composition, board size and firm value. Equations (1), (2), (4) and (5) are all significant at the 1% level¹². Equation (3) is significant at the 5% level ($P > \chi^2 = 0.0266$). The 3SLS results are presented in the following sections.

8.4.1.1 Eq. (1) HPD compensation

HPD ownership power and political power

Equation (1) relates to HPD cash compensation (lghpdtot). As the research results show, HPD ownership is strongly and positively related to HPD compensation (1% sig. level), which is consistent with Chen (2006) and Li et al. (2007). The regression results indicate that controlling for other variables, a 0.0001% increase in HPD ownership will result in a 15.35% increase in HPD compensation. The results are consistent with model 4, except that the magnitude of coefficient is approximately 3.5 times bigger in eq. (1) than in model 1 (which used the dataset including the top 3 highest paid directors instead of the HPD only). The political power of the HPD has a

¹² The 'R squares' are negative for all the equations. The reason for negative 'R square' is, for two- and three-stage least squares, some of the regressors enter the model as instruments when the parameters are estimated. However, since the goal is to fit the structural model, the actual values, not the instruments for the endogenous right-hand-side variables, are used to determine R-squared. The model residuals are computed over a different set of regressors from those used to fit the model. The two- and/or three-stage least estimates are no longer nested within a constant-only model of the dependent variable, and the residual sum of squares is no longer constrained to be smaller than the total sum of squares (STATA 8, REFERENCE N-R, 2003).

positive relation with HPD compensation as predicted. After controlling for other variables, HPD compensation is 92.94% higher if the HPD also serves as Party Secretary/Chair (5% sig. level). The results are consistent with model 1 except that the magnitude of coefficient is approximately 13 times bigger in eq. (1) than in model 1. The differences of the magnitude of the coefficients between model 4 and model 5 suggest that either the HPD's ownership power and political power have much bigger influences over his/her compensation compared to the other top 3 highest paid directors or the HPD's ownership power and political power have a much stronger influence on HPD compensation in the simultaneous model. I have re-run eq. (1) using OLS regression. The coefficients of HPD ownership and political power are 500.69 and 0.018 respectively, which are closer to the coefficients in model 1. The results support the latter explanation that the HPD's ownership power and political power have a much stronger influence on HPD compensation in the simultaneous model, which suggests that 3SLS is more efficient than OLS regression.

Firm performance

No significant relationship between firm performance and HPD compensation was found. Four performance measures - accounting return (ROA), lagged ROA, market return (EPS) and lagged EPS - were used. The results are not significant for all the performance variables. These results are partly consistent with Firth et al (2006) who find a positive relation between CEO pay and firm performance only under certain

ownership conditions. For example, firms that have state bureaucratic agencies as the major shareholder do not appear to have performance-related pay schemes for CEOs. Firms that have state-owned enterprises as the major shareholder link CEO pay to profitability. The results are not consistent with Chen (2006), who finds a significant and positive relationship between the average pay of the top 3 highest paid directors and ROA in Chinese listed companies. However, the average pay of the top 3 highest paid directors may not represent the CEO/highest paid director's compensation, thus it may not be precisely comparable to current results.

Board characteristics

The lack of relation between HPD compensation and performance may well be explained by the fact that HPD compensation has little to do with the absolute performance of the CEO or other senior managers. Instead, as the research results show, HPD compensation is strongly related to board and individual characteristics, ownership structure and location.

First, for board characteristics, the results show that the percentage of independent directors has a negative relationship with HPD compensation, although statistically insignificant. The studies on the percentage of independent directors and HPD compensation in Chinese companies remain unclear. For example, Firth et al. (2007) report a significant and negative relation between the percentage of independent

directors and CEO compensation. However, Li et al. (2007) and Chen (2006) find a positive and significant relationship between the percentage of independent directors and executive compensation.

Second, the research results show that board size is positively related to HPD compensation (5% sig. level). After controlling for other variables, the addition of each director will result in a 17.55% increase in HPD compensation. The result is consistent with Core et al. (1999), who report a positive relationship between board size and CEO compensation in US firms.

HPD age, tenure and gender

For the HPD characteristics, first, no relation was found between HPD compensation and age, which is consistent with Li et al. (2007). Second, HPD tenure (10% sig. level) and tenure square (5% sig. level) are both significantly related to HPD compensation with negative and positive signs respectively, indicating a non-linear U-shaped relationship between HPD compensation and tenure. Third, the research results show that HPD gender is positively related to compensation (10% sig. level).

State, legal person and foreign ownership

For ownership variables, first, HPD compensation is negatively related to state ownership but it is not statistically significant. The result is consistent with Firth et al. (2006) and Chen (2006).

Second, legal person ownership is negatively and significantly related to HPD compensation. More specifically, after controlling for other variables, a 0.1% increase in legal person shares will result in a 0.07% decrease in HPD compensation. The result is consistent with Li et al. (2007), who also report a negative relationship between CEO compensation and legal person ownership.

Third, there is a positive but insignificant relation between HPD compensation and foreign ownership, which is inconsistent with Chen (2006), who finds a positive and significant relationship between executive compensation and foreign ownership. However, in Chen's (2006) study, the average pay of the top 3 highest paid directors, rather than the real HPD compensation, was used and this could be one of the reasons that has led to the differences between the two studies.

Firm size, location and business risk

There are no significant relationships found between firm size (*lgtotasset*), business

risk (sdev) and HPD compensation. HPD compensation is still positively related to location (1% sig. level), which is consistent with previous findings in this study (Models 1 and 2).

8.4.1.2 Eq. (2): HPD ownership

Equation (2) relates to HPD ownership. HPD ownership is negatively related to firm value (Tobin's Q) but it is not statistically significant. For board characteristics, duality2 is also negatively related to HPD ownership but it is not significant. The percentage of independent directors and board size are both strongly related to HPD ownership. HPD ownership increases with the percentage of independent directors (1% sig. level) and decreases with board size (1% sig. level). HPD ownership also decreases with company age (yripo) (1% sig. level) and increases with state ownership (10% sig. level).

8.4.1.3 Eq. (3): Board composition

Equation (3) relates to board composition and the percentage of independent directors. The percentage of independent directors increases with board size (1% sig. level) and company age (yripo) (1% sig. level). The relationship between the percentage of independent directors and board size is consistent with the argument that these two governance mechanisms are substitutes (Mak and Li, 2001).

8.4.1.4 Eq. (4): Board size

Equation (4) relates to board size. Board size increases with firm size (1% sig. level), which suggests that bigger companies have more directors on the board. Board size is negatively related to HPD ownership (5% sig. level) and HPD political power (party) (5% sig. level), which suggests that HPD political power is effective in monitoring board size.

8.4.1.5 Eq. (5): Firm value

Equation (5) relates to firm value, proxied by Tobin's Q. Tobin's Q is negatively related to HPD ownership square (10% sig. level), positively related to the percentage of independent directors (5% sig. level) and negatively related to board size (1% sig. level), which is consistent with previous literature, suggesting that a higher percentage of independent directors and smaller boards is associated with higher firm value (Ezzamel and Watson 1993; Yermack 1996).

8.4.2 Regression diagnosis and robustness checks

8.4.2.1 Regression diagnosis

As discussed in chapter 7, for the firm performance variables (return on assets and earnings per share), one extreme outlier was detected for both variables. Model 5 was originally conducted using a full data sample. Following model 1C, the extreme outlier was deleted. The regression results remained consistent except that the significance level of eq. (2) improved dramatically. Therefore, this outlier was removed from subsequent tests.

The variance inflation factors (VIF) of the independent variables were checked separately for all 5 equations in model 5 to detect the possibility of a problem of multicollinearity. The VIFs for all 5 equations are all less than 3, except for age, agesq (age square), tenure and tensq (tenure square) because of the functional relationship between age and age square and tenure and tenure square. I re-ran the 5 equations after removing agesq and tensq and the regression results remained consistent. The VIFs of the new equations are all less than 3, which indicates that multicollinearity does not pose a serious problem.

8.4.2.2 Robustness checks

The sensitivity of the simultaneous model to the changing of the exogenous and endogenous variables was examined according to the following steps:

1. Model 5 was re-run by using the logarithm of percentage of executive ownership. Eq. (2) became insignificant (P-value = 0.9845). One reason could be that there were many directors with zero ownership and those observations were dropped by logarithmic transformation. P-values for eq. (1) and (3) were both improved to 0. P-values for eq. (4) and (5) were both 0, which was consistent with the original model 5. In eq. (3), board size is still positively related to the percentage of independent directors at the 1% significance level. Company age (yripo) is still positively related to the percentage of independent directors but less significant (1% to 10%). In eq. (4), HPD ownership remained negatively related to board size at the 5% significance level. Political duality (party), foreign ownership (foreignown) and firm size (lgtotasset) became insignificant. Company age (yripo) became negatively related to board size (10% sig. level). In eq. (5), board size still has a negative relationship with firm value (Q_adj) (1% sig. level). The relationship between Q and the percentage of independent directors became insignificant.

2. Duality2 (which includes both CEO/Chair and CEO/Deputy Chair) was replaced by duality1 (which includes CEO/Chair only). Eq. (1) and (2) became statistically

insignificant after this change (P-value = 0.7092 and 0.2965 respectively). In eq. (3), board size and company age (yripo) remained significantly related to the percentage of independent directors (both at the 1% sig. level). In eq. (4), HPD ownership, political duality, firm size and foreign ownership all became insignificant in the new model, whereas company age (yripo) became negatively related to board size (1%). In eq. (5), board size remained negatively related to firm value, although it became less significant (P value is reduced from 0.01 to 0.023). The percentage of independent directors became insignificant in the new model, whereas HPD compensation (lghpdtot) became negatively related to firm value but the relationship is weak (10% sig. level). Although there were some consistencies between the two models after dual1 was replaced by dual2, the divergences of the results could be due to the special characteristics in Chinese listed companies. CEO/Chair duality alone may not capture all the power dynamics in the corporate governance system because CEO/Chair and CEO/Deputy Chair are both within the system and are endogenously determined. Excluding the CEO/Deputy Chair therefore leads to the problem of omitted variables in the simultaneous model and can further lead to biased estimates.

3. The debt/equity ratio was replaced by the debt/total assets ratio; the significance level of the equations remained consistent with the old model. In eq. (1), location remained positively related to HPD compensation. Board size and political duality became negatively related to HPD compensation, whereas in the old model, the relationships were both positive. However, both relationships are weak in the new

model (10% sig. level). There are no consistencies in eq. (2) results on HPD ownership between the two models. The results of eq. (3) on the percentage of independent directors are consistent in the two models. Board size and company age (yrpo) remained positively related to the percentage of independent directors (both 1% sig. level). In eq. (4) on board size, HPD ownership and political duality remained negatively related to board size. The negative relationship between foreign ownership and board size became less significant (p-value is reduced from 0.085 to 0.108). In Eq. (5) on firm value, the percentage of independent directors remained positively related to firm value (5% sig. level). Board size remained negatively related to firm value (1% sig. level).

4. Ownership variables were recoded as dummy variables. As discussed in Chapter 7, state, legal and foreign ownership variables have skewed distribution. Due to the large numbers of zero value in the state, legal person and foreign ownership data, the 3 ownership variables were recoded as dummy variables instead of using logarithm transformation to examine the effects of the simultaneous model. The results of the new model are largely consistent with the old model, except for the significance level of eq. (3) being improved to 1%. In eq. (1) on HPD compensation, HPD ownership, dual2, HPD tenure square, HPD gender and location remained significantly related to HPD ownership with the same signs. In eq. (2), the percentage of independent directors, board size and company age is still positively related to HPD ownership (all at 1% sig. level). The coefficients of both state and legal

ownership were greatly improved to the 1% significance level. Both state and legal ownership are positively related to HPD ownership. In eq. (3), both board size and company age remained positively related to the percentage of independent directors (1% sig. level). State and legal ownership became negatively related to the percentage of independent directors (both at 1% sig. level). In eq. (4) on board size, the negative relationship between HPD ownership and board size became more significant. The coefficients of political duality and firm size became insignificant. Again, state and legal ownership became positively related to board size (both at 1% sig. level). In eq. (5) on firm value, the positive relationship between the percentage of independent directors and firm value became more significant (sig. level improved from 5% to 1%). Board size remained negatively related to firm value (1% sig. level). HPD compensation became negatively related to firm value (10% sig. level). Both state and legal ownership became positively related to firm value (both at 1% sig. level). Overall, the results are largely consistent with the original model except that both state and legal ownership became very significant in eqs. (2)-(5). As both state and legal ownership can be treated as government ownership, the results suggest that government ownership is positively related to HPD ownership, board size and firm value and negatively related to the percentage of independent directors.

8.5 Conclusion

This chapter has presented empirical analysis on the determination of executive compensation in the sample of Chinese listed companies using 2 datasets. The first dataset includes the 779 top 3 highest paid executive directors from 71 Chinese listed companies between 1998 and 2001. The second dataset includes the 284 highest paid directors from the same 71 Chinese listed companies between 1998 and 2001. Five hypotheses developed from the tournament theory, managerial power theory and simultaneous theory were tested using various regression techniques. Specifically, the political influences on executive compensation and organization compensation structure were examined in models 1-4. Finally, executive compensation, executive ownership, board characteristics including political duality (CEO/Party Secretary duality) and firm value were analyzed in a simultaneous model (Model 5). Detailed discussions which combine the empirical results with theory and institutional background are presented in the next chapter.

Chapter 9 Discussion

9.1 Introduction

This thesis focuses on the determinants of executive compensation from three aspects: the tournament theory, managerial power theory and simultaneous framework. These models have been adapted in order to fit with the special Chinese institutional background. Furthermore, five hypotheses have been developed based on these adapted models. The preliminary analysis and regression analysis on executive compensation in Chinese listed companies have been presented in Chapters 7 and 8. This chapter provides a detailed discussion based on the research findings.

This chapter is organized as follows: section 2 is a summary of the hypotheses and empirical results, followed by a discussion of the empirical findings of the managerial power model, tournament model and simultaneous model in section 3, section 4 and section 5 respectively. Section 6 concludes this chapter.

9.2 Summary of Hypotheses and Findings

Table 9.1 Summary of Hypotheses and Empirical Findings

Hypo	Dependent Vs	Independent Vs	Predicted	Results
H1	Executive compensation	Executive ownership	+	+***
	Executive compensation	Political power	+	+**
H2	Executive compensation	Organization levels	Not convex	supported***
	Executive compensation	Level*gov (LG)	-	***
H3	Tournament prize (pay gap)	No. of contestants	Weak+	No relation
	Tournament prize (pay gap)	con*gov (CG)	-	No relation
H4	Firm performance (Q)	Pay gap (WD)	+	+***
	Firm performance (Q)	WD*gov(WG)	-	***
H5-1	HPD compensation	HPD ownership	?	+***
	HPD compensation	Political duality	?	+**
	HPD compensation	CEO/chair	?	**
	HPD compensation	CEO/deputy chair	?	No relation
	HPD compensation	% of independent directors	?	No relation
	HPD compensation	Board size	?	+**
	HPD compensation	State ownership	?	No relation
	HPD compensation	Legal person ownership	?	*
	HPD compensation	Foreign ownership	?	No relation

H5-2	HPD ownership	CEO/chair CEO/deputy chair	?	No relation
	HPD ownership	% of independent directors	?	+***
	HPD ownership	Board size	?	-***
	HPD ownership	Political duality	?	No relation
	HPD ownership	State ownership	?	+
	HPD ownership	Legal person ownership	?	No relation
	HPD ownership	Foreign ownership	?	No relation
H5-3	% of independent directors	HPD ownership	?	No relation
	% of independent Directors	CEO/chair CEO/deputy chair	?	No relation
	% of independent directors	Board size	?	+***
	% of independent Directors	Political duality	?	No relation
	% of independent directors	State ownership	?	No relation
	% of independent Directors	Legal %son ownership	?	No relation
	% of independent directors	Foreign ownership	?	No relation
H5-4	Board size	HPD ownership	?	-***
	Board size	CEO/chair CEO/deputy chair	?	No relation
	Board size	% of independent directors	?	No relation
	Board size	Political duality	?	-**
	Board size	State ownership	?	No relation
	Board size	Legal person ownership	?	No relation
	Board size	Foreign ownership	?	No relation

H5-5	Firm value (Tobin' s Q)	HPD ownership	?	No relation
	Firm value (Tobin' s Q)	CEO/chair CEO/deputy chair	?	No relation
	Firm value (Tobin' s Q)	% of independent directors	?	+**
	Firm value (Tobin' s Q)	Board size	?	-***
	Firm value (Tobin' s Q)	Political duality	?	No relation
	Firm value (Tobin' s Q)	Firm size (lgasset)	?	+***
	Firm value (Tobin' s Q)	State ownership	?	No relation
	Firm value (Tobin' s Q)	Legal person ownership	?	No relation
	Firm value (Tobin' s Q)	Foreign ownership	?	No relation

* 0.10 significance level; ** 0.05 significance level; and *** 0.01 significance level.

9.3 Managerial Power and Executive Compensation in China

Lambert et al. (1993) define managerial power as the ability of managers to influence or exert their will or desires on the remuneration decisions made by the board of directors. Grabke-Rundell and Gomez-Mejia (2002) propose that CEO compensation is positively related to CEO structural power, ownership power, expert power and prestige power.

One of the goals of this study is to explore the relationship between managerial power and executive compensation in China. In this study, two executive power dimensions were developed based on the Chinese context. After that, their

relationships with executive compensation were tested in Chinese listed companies. The first power dimension is 'structural power', which is measured by executive ownership. Executive ownership is treated as an indicator of structural power for two reasons. First, in Chinese listed companies, CEO shareholdings are usually very small. As shown in chapter 7, the average HPD shareholdings were 0.0049% of the total company shareholdings in 2001. In other words, it is unlikely for Chinese executives to exert ownership power to influence board decisions on his or her compensation package because of the negligible executive ownership they have, especially when facing massive state ownership. Second, as Tenev and Zhang (2002) show, the Chinese government allocates shares to the CEO based on his or her rank in the managerial hierarchy. In other words, the share of executive ownership is a reflection of the executive's position in the hierarchy. Based on the above analysis, executive ownership is treated as the indicator of structural power in Chinese listed companies.

As Table 9.1 shows, the research findings strongly support the hypothesis that executive compensation is positively associated with executive structural power in the sample of Chinese listed companies. The result is consistent with Li et al. (2007) and Chen (2006), who find a positive relationship between managerial ownership and executive compensation in Chinese listed companies.

The second power dimension is 'political power', which is a new managerial power dimension developed in this study. It also refers to political duality (Chairman/Party

Secretary) in this paper. The political power of executives and its relationship with executive compensation is an important but under-explored area in the study of Chinese corporate governance. In a Chinese listed company with dominant state ownership, the decision making power is shared among Chairman, Party Secretary and CEO. In most cases, the Party Secretary is appointed as Chairman in listed companies with state ownership. The CEO is recommended by the Chairman and the Party Secretary and appointed by the State-owned Assets Supervision and Administration Committee of State Council (SASAC). In such a system, the Chairman/Party Secretary duality puts the person in a dominant position in the company. As a result, political power would allow the Chairman to pursue self-interests, including a large compensation package. As Table 9.1 shows, the research findings support the hypothesis that executive compensation is positively related to executive political power.

Two conclusions can be made based on the above research findings (that in Chinese listed companies, executive compensation is influenced by structural power and political power). First, the Chinese government still has a direct and strong influence on executive compensation in Chinese listed companies. Although the government has lessened control over SOEs since 1993, state ownership still plays an important role in Chinese listed companies. The mergers and acquisitions of SOEs are planned and monitored by central or local government. Moreover, since there is no well-established managerial labour market as found in Western countries, in Chinese

listed companies, especially those with high state ownership, top executive directors are appointed, evaluated and dismissed by central or local government. In this system, the government, through the State-owned Assets Supervision and Administration Commission (SASAC), acts as shareholder, regulator, supervisor, administrator and operator of SOEs at the same time, which could further lead to conflict and inefficiency.

Second, as Table 9.1 shows, political power has great influence over executive compensation. On the other hand, model 2 and model 5 report no relationship between firm performance and executive compensation. In other words, executive compensation in Chinese listed companies is more based on political power than firm performance. Executive compensation in Chinese listed companies is more like a reward for political loyalty and correctness than good management. Influenced by such underlying principles, executives are particularly sensitive to how their superiors in the political and administrative hierarchy would assess their performance (Tenev et al., 2002). As a result, some executives will seek political correctness and show political loyalty (such as receiving retired army officers, creating more job opportunities and investing in certain government projects) rather than try to maximize firm value. Other potential risks include short-term based investment, over-investment and corruption (Guo and Jiang, 2003). All these could further lead to poor firm performance in the long term.

The above discussions have some implications for corporate governance in Chinese listed companies. Firstly, as discussed above, direct and strong government intervention in board decision-making could lead to political-based decisions and further leads to poor firm performance in the long term, therefore, in order to solve this problem, there is a need to further reduce government intervention in board decision-making and to grant greater autonomy for executives. The government can no longer act as shareholder, regulator, supervisor, administrator and operator of SOEs at the same time.

Secondly, autonomy and accountability should go hand in hand. In other words, autonomy needs to be balanced with greater accountability (Firth et al., 2006). Without appropriate monitoring mechanisms, autonomy and ownership reform could only lead to corruption and exploitation, which further harms the interests of state shareholders. Moreover, without proper legal protection for individual shareholders, the right and interest of minority shareholders could be harmed as well. Therefore, although the government should further decentralize the decision-making power, this does not mean that the government can abandon their responsibility as regulator and supervisor. Instead, in a system which characterized by a dominant state ownership, strong government influence and weak minority shareholders, there is a greater need for the government to set up a good monitoring system. The key point is that the government should differentiate carefully between ‘intervention’ and ‘supervision’.

Thirdly, as the research findings indicate, the compensation of Chinese executives is based more on political power than firm performance. The government reviews and assesses the performance of Chinese executives. It also plays an influential role in the determination of executive compensation. The whole decision-making process, as well as specific performance appraisal criteria, is unknown to outsiders. Under such a system, sometimes political loyalty and correctness could replace objective financial measures as the performance appraisal criteria, which could stimulate management misbehaviour and poor corporate governance. Therefore, there is a need to reform the executive compensation system. Specifically, the performance of executive directors should be appraised by objective financial measures rather than political-based criteria. The compensation should also reflect the market rate rather than political connections. Last but not least, more transparent financial disclosure and the disclosure of bonuses, benefits and allowances of top managers are needed to improve financial transparency.

Fourthly, there is close and frequent staff transfer between government and SOEs. Competent government bureaucrats are sent to run SOEs and vice versa. This kind of practice results in a strong and direct political influence on SOEs. On the other hand, it also means that SOEs cannot retain their competent managers because competent managers are likely to be promoted to government positions. SOEs, to some degree, are like a training school for government bureaucrats, which could further lead to a lack of well-qualified and experienced senior managers in SOEs. In order to solve this

problem, there is a need to openly recruit and select professional managers through a market scheme. Those incompetent managers should be dismissed instead of being reallocated to other posts. Developing an open professional job market and training local managers to become business leaders can be considered as the first step towards alleviating the problem (Firth et al. 2006).

9.4 Tournament Theory and Executive Compensation in China

Tournament theory considers a group of agents who compete for a fixed prize and are rewarded on their relative performance. An application of tournament theory is the competition to become CEO (Conyon et al. 2001). Tournament theory is a reduced form of an agency model, in that the managers work for a principal who has pre-committed to a compensation contract. In order to provide adequate incentives, it may be necessary to engineer extremely large salary differences between the top executive ranks of a corporation (Lambert et al., 1993; Main et al., 1993). Tournament theory has three propositions: 1. the relationship between executive compensation and organizational level is convex; 2. the pay gap between the HPD and the average executive team increases with the number of contestants; 3. firm performance is positively related to executive pay gap. Compared with the agency theory, the tournament theory is a relatively new one in corporate governance, but there has been growing interest in the tournament theory recently. For example, Eriksson (1999) examines tournament models in Danish firms and finds evidence which supports all

three tournament propositions. Conyon et al. (2001) also find evidence to support the first two propositions in the UK business context.

Empirical studies on the tournament model in China are very rare, therefore, the second goal of this study is to test the tournament model in Chinese listed companies, but the model needs to be adapted by taking into account the different business environment. For example, in the tournament model, the prize for the winner of the contest (CEO) is cash or cash equivalents, whereas in Chinese SOEs or listed companies controlled by the government, promotion within the Party/government is another important form of reward for top performing executives. In addition, political connection with the government is an important factor in the promotion process of top managers in state-controlled companies. Therefore, when applying to the Chinese listed companies, the tournament model was modified and adapted to the Chinese business context and three hypotheses have been developed based on the Chinese context.

First, in Chinese listed companies, the pay difference between the highest paid director and the second highest paid director is bigger than the pay difference between the second highest paid director and the third highest paid director, but the difference between the two is not big enough to be a convex relationship (H2a). Moreover, higher state ownership would further reduce the pay difference between different levels (H2b).

Second, the relationship between the executive pay gap and the number of contestants is weak in Chinese listed companies (H3a), and higher state ownership would further weaken the relationship (H3b).

Third, corporate performance is positively related with the executive pay gap (H4a), especially in less government-controlled Chinese listed companies (H4b).

Hypotheses H2a, H2b, H3a and B3b are used to explore the organizational incentives structure in Chinese listed companies. Hypotheses H4a and H4b are used to explore the relationship between the tournament incentive structure and firm performance in China.

As Table 9.1 shows, Hypotheses 2 and 4 are broadly supported. The research findings support the hypothesis that the pay difference between the highest paid director and the second highest paid director is bigger than the pay difference between the second highest paid director and the third highest paid director, but the difference between the two is not big enough to be a convex relationship (H2a). It also shows that higher state ownership would further reduce the pay gap between different levels (H2b). However, it is worth pointing out that the pay gap between Chinese companies is much smaller than that in western companies. For example, in this study, it is found that executive compensation increases by 33% when the director is promoted from level 2 to level 1. By contrast, studies on UK and US companies report a 60% and 140%

pay rise from level 2 to level 1 (Main et al., 1993; Conyon et al., 2001).

This relatively smaller pay gap in Chinese companies, especially in companies with higher government influence, could be caused by the following reasons. First, as discussed in chapter 5, the existence of strong non-cash incentives - political promotions - could have weakened the cash incentives in Chinese listed companies. Second, when state ownership is high, government intervention is normally high. In some cases, the pay structure in SOEs follows the same structure for civil servants, which is characterized by a relatively small pay gap between levels. Third, even in those SOEs with higher autonomy, CEO compensation is still influenced by government policy. For example, the CEO compensation in SOEs in Beijing was capped by no more than 9 times the workers' average pay (Beijing Morning Post, 28th December, 2007). Generally speaking, typical CEO compensation in Chinese SOEs is usually capped by the government by 3 to 15 times the average workers' pay. More recently, 'the decision on executive compensation in SOEs' has been proposed by the Ministry of Human Resources and Social Security of China (MHRSS), which has specific guidelines to cap executive compensation (Yangtze Evening Post, 9th February 2009).

The research hypotheses that corporate performance is positively related with the executive pay gap (H4a), especially in less government-controlled Chinese listed companies (H4b), are also supported. As Table 9.1 shows, firm value is strongly

related to executive pay dispersion, which suggests that the pay gap between the HPD and the average executive team serves as an effective incentive for executive directors in Chinese listed companies. Moreover, the relationship between firm value and pay dispersion is stronger in less government-controlled companies, which suggests that higher state ownership could weaken this tournament incentive for executive directors.

The research findings have some implications for Chinese corporate governance. Firstly, the tournament model provides an alternative design for incentives in China. The problem of incentives and executive compensation in listed SOEs has become a controversial topic for the media and academics in China since the 1990s. Currently, academics and the public have different views on executive compensation in Chinese listed companies. On the one hand, many researchers (Chen 2006; Firth et al., 2006; Li et al., 2007) argue that the government should not intervene too much in executive compensation. They argue that executives in listed SOEs are under-paid compared to foreign or private companies and their salaries are not high enough to motivate, attract and retain competent managers. In addition, executive pay is not adequately related to performance. Following the arguments given above, they believe that executive compensation should reflect the market rate rather than be capped by the government. On the other hand, some academics and the public argue that CEOs in many listed SOEs are already paid too much and the pay differences between executives and average workers in listed SOEs have been growing too fast in recent years. They

argue that the huge profits in industries such as tobacco, petrol and telecommunications cannot justify big CEO compensation packages because these industries are monopolized by the government. In other words, these companies perform well because of their monopoly position rather than because the managers have made a great contribution. Furthermore, besides fast growing pay, those executives in SOEs also have many privileges. With this argument in mind, they argue that executive compensation, especially in SOEs, should be monitored and capped. In such a context, the tournament incentive mechanism could provide an alternative way to design executive compensation but without necessarily increasing the total compensation cost. For example, following the tournament theory, the company can further increase the pay gap between the CEO and the average compensation of other executive directors as an alternative to motivating executives and improving firm performance. The next question is: can tournament theory be applied to Chinese companies? The answer is: the tournament theory could be applied to Chinese companies, but great attention should be paid when applying it. Firstly, as shown in Table 9.1, there is a strong relationship between pay dispersion and firm performance. In other words, firm performance could be improved by increasing the pay gap.

Secondly, the pay gap could still be increased further. On the one hand, the pay gap between organization levels is much smaller in China than in western countries. For example, in the UK, the average boss-to-worker pay ratio across the FTSE is 66 to 1 based on salary or 98 to 1 with share options and other incentives (World Business, 30

August 2007) whereas the pay gap between the top executive and normal workers is typically between 3 to 15 times in most Chinese SOEs. On the other hand, as this research indicates in China, executive compensation increases by 33% when the director is promoted from level 2 to level 1 in this study. By contrast, studies on UK and US companies report a 60% and 140% pay rise from level 2 to level 1 (Main et al., 1993; Conyon et al., 2001). Therefore, the great difference between Chinese and Western companies indicates that there is still room to increase pay dispersion in China.

Thirdly, applying the tournament model has cultural support in China. Traditionally, managers' pay is linked with their position in the corporate hierarchy (Child, 1994). Although the Chinese government has reformed the compensation policy in SOEs, trying to make it more performance- and competence-based, however, position-related pay remains as a large proportion of the total pay package and this practice is generally accepted in China. Moreover, Chinese cultural values could also support a compensation structure based on the tournament model. As well as having a high level of collectivism, Chinese culture is also characterized by 'high power distance' (Hofstede, 2001). In other words, great power imbalance is expected between superiors and subordinates. It is therefore believed that a greater pay dispersion, which is associated with greater power distance, is likely to be accepted by Chinese employees and there will be less resistance in accepting a compensation package based on a tournament model.

Although the tournament model provides an alternative way to design executive compensation, to motivate executives and to improve firm performance, great attention should be paid when using it. First, a strong positive relationship was found between executive pay dispersion and firm performance, which indicates that firm performance could be improved by compensation based on the tournament model. On the other hand, the research findings also show that this relationship is weakened by higher government ownership. One possible reason is that the effect of pay dispersion could be mediated by political reward. In Chinese listed companies with higher state ownership and stronger government intervention, the non-cash incentive - political promotion - is stronger and as a result, the cash (tournament prize) incentive could be weakened. In such a system, because the political reward is so strong, the executive directors might go after political reward instead of trying to improve firm performance. Therefore, the tournament model can only work when government intervention and distraction, such as political reward is further reduced.

Second, although China is a society with great power distance, it is also a society with a high level of collectivism (Hofstede, 2001). One feature of collectivism is the great emphasis on internal equality, sometimes on egalitarianism. Moreover, China is a socialist society which also emphasizes 'harmony' and 'equality'. Therefore, although pay dispersion is acceptable, there is also a great expectation of 'reasonable' pay dispersion. But what pay gap is 'reasonable'? This question remains unanswered and further qualitative research in this area is called for.

Third, the tournament model may not apply to some companies. Eriksson (1999) argues that in order to attract the right people to participate in a tournament, the spread cannot be 'too big'. Moreover, if the cooperation of the managers is essential for the success of the firm, rewarding them according to their individual achievements may not be a good idea. Lazear (1995) argue that for 'hawkish' firms, which are firms in which cooperation is less important, wider pay gaps may enhance performance. By contrast, in 'dovish' firms, which are firms in which cooperation is more important for the success of the firm, there may be a need to adopt a more compressed pay structure to reduce the anti-cooperative behaviour of managers. Therefore, compensation based on the tournament model is not a universally applicable practice. Organizational culture, company history and nature of the business should be taken into account before adopting a compensation based on the tournament model.

Fourth, the sample of companies used in this study is relatively small, which may have biased results. Therefore, more comprehensive research is needed in the future to improve the validity of the above arguments.

9.5 Executive Compensation, Executive Ownership and Board Characteristics - a Simultaneous Framework

Researchers argue that executive compensation, ownership structure and board composition are determined by each other and these variables also influence a firm's

performance (Jensen and Meckling, 1976; Mehran, 1995). Core et al. (1999) find that board and ownership structure explain a significant amount of cross-sectional variation in CEO compensation; moreover, CEOs earn greater compensation when governance structure are less effective. Chung and Pruitt (1996) argue that executive compensation, executive ownership and firm value are jointly determined. Their empirical results support the view that the firm optimally establishes its managerial compensation plan in response to both its operating environment and the specific personal characteristics of its CEOs.

Research findings on the impact of corporate governance on Chinese executive compensation are reported, but the results are mixed. Firth et al. (2007) discover that corporate governance factors have a significant impact on HPD compensation, but the impact is different from other countries. Large board size appears to constrain HPD pay, boards with a large proportion of non-executive directors and/or boards with a separate CEO/Chair are more likely to implement performance-related pay schemes for their CEOs/HPDs. On the other hand, Chen (2006) does not find supportive results for the monitoring effects in institutional ownership, managerial ownership and independent directors. Instead, higher institutional ownership, higher managerial ownership and/or higher proportions of independent directors seem to lead to higher executive pay. Li et al. (2007) find little evidence that Chinese CEOs take advantage of weaker board structures or less demanding shareholders to extract higher compensation packages. Instead, they suggest that increasing an CEO pay level is

caused by a globalized managerial labour market and compensation standards. The huge inconsistencies of previous research findings on executive compensation, ownership and board structure in China may be due to the fact that the endogenous nature of these variables is not addressed.

Unlike previous studies on executive compensation in China, this study is explicitly based on the notion that executive compensation, executive ownership, board structures and firm value are endogenously determined through a process in which one affects the other. This study is based on Chung and Pruitt's (1996) simultaneous model on executive compensation but with some adaptations to fit with the special Chinese business context. Specifically, 4 board characteristic variables (political duality, board composition, board size and board duality including both CEO/Chairman and CEO/Deputy Chairman dualities) were added as endogenous variables. HPD political duality (Chairman/Party Secretary) is a special characteristic which distinguishes Chinese listed companies from their foreign counterparts. As the power centre in Chinese board of directors, Chairman/Party Secretary (political duality) is more important than CEO/Chair duality in board decision-making. Therefore political duality, executive compensation, executive ownership and other board characteristics are all included as endogenous variables in the simultaneous model.

The empirical analysis was conducted by the three-stage least squares method,

which produced more insightful results than OLS regression. The results are consistent with the study of Chung and Pruitt (1996), which strongly supports the concept of variables interaction and the process of simultaneity in the market/institutional determination of these variables. More detailed research finds and discussions are reported below.

HPD compensation

As Table 9.1 shows, HPD compensation is positively related with HPD ownership, political duality and board size. HPD compensation is negatively related with CEO/Chair and CEO/Deputy Chair duality and legal person ownership. No relation is found between HPD compensation and the percentage of independent directors, state ownership and foreign ownership.

In the simultaneous model, HPD ownership is strongly and positively related to HPD compensation, which indicates that HPD ownership could enhance HPD compensation. However, as the preliminary analysis shows, the average HPD shareholdings are only 0.0049% of the total company shareholdings in Chinese listed companies in 2001. The White Paper on Chinese Entrepreneur Value (2004) also reports that more than 60% of the top management in Chinese listed companies has ‘zero ownership’ in 2002. Taking into account the negligible ownership they have, it is unlikely for Chinese executives to use their ownership power to enhance their pay

level. A more reasonable explanation is to treat HPD ownership as the indicator of the executive's structural power because Chinese government normally allocates shares based on the executive's position in the political hierarchy. Therefore, although the simultaneous model shows that HPD ownership is strongly and positively linked with HPD compensation, it is actually the executive's structural power that helps enhance the compensation level, which also confirms the research findings of the managerial power model.

Agency theory suggest that when the CEO also serves as Chairman, it gives the CEO too much power over the decision-making process, and allows the CEO to pursue personal interests at the expense of shareholders' interests, such as a larger CEO compensation package (Jensen, 1993; Brickley et al., 1997; Core et al., 1999). In the Chinese context, Firth et al. (2007) find that firms with a dual CEO/Chairman place far less weight on performance-related pay in Chinese listed companies. Chen (2006) finds similar results in that executive compensation is positively related to CEO/Chairman duality. However Li et al. (2007) find no relationship between CEO/Chair duality and CEO compensation. The inconsistency of previous empirical results might be due to the following reasons: firstly, the previous research ignored the other more powerful duality in Chinese boards of directors - the Chairman/Party Secretary duality. Secondly, the previous research ignored the endogenous nature of board characteristics and executive compensation. In the simultaneous model, HPD political duality is strongly and positively related to HPD compensation. It is also

found that board duality (including both CEO/Chair and CEO/Deputy Chair) is negatively related to HPD compensation. The results confirmed that political duality in Chinese listed companies can exert more power on board decisions on compensation than board duality.

Previous research on executive compensation and board size in China using the OLS method produces mixed results. Firth et al. (2007) find that HPD compensation is negatively related to board size. Li et al. (2007) find no relation between CEO compensation and board size. Chen (2006) finds an inverse U-shaped relationship between HPD compensation and board size. The negligence of the endogenous nature of executive compensation and board characteristics might be the reason for the inconsistency of the empirical results. Unlike previous studies, by using 3SLS method, the results show that HPD compensation is positively related to board size in the simultaneous model, which is consistent with the agency theory that large boards are less effective in monitoring executive compensation (Jensen, 1993; Yermack, 1996; Core et al., 1999).

In the simultaneous model, I find no relationship between HPD compensation and the percentage of independent directors. Recent studies report mixed results of the relationship between HPD/CEO compensation and the percentage of independent directors in Chinese listed companies (Chen 2006; Firth et al. 2007; Li et al. 2007) and this area calls for further research.

No significant relationship is found between state ownership and HPD compensation, which is consistent with the studies of Firth et al. (2006), Chen (2006) and Li et al. (2007). It is found that HPD compensation is negatively related to legal person ownership, which is consistent with the argument that legal person ownership provides more professional monitoring (Xu and Wang, 1999; Sun and Tong, 2003).

HPD ownership

As Table 9.1 shows, HPD ownership is negatively related to board size, and positively related to the percentage of independent directors and state ownership. No relation is found between HPD ownership and board duality, political duality, legal ownership and foreign ownership.

Jensen and Meckling (1976) emphasize the role of executive stock ownership as a mechanism to align the interests of managers and shareholders and promote greater managerial efforts. In this study, HPD ownership is negatively related to board size in the simultaneous model, which suggests that small boards encourage the alignment of the interests of shareholdings and CEOs via CEO shareholdings. The result is consistent with agency theory which argues that small boards are more effective (Jensen, 1993; Yermack, 1996).

Moreover, I find that HPD ownership is positively related to the percentage of

independent directors, which indicates that independent directors help align the interests between the HPD and the shareholders. The result is consistent with the agency perspective which argues that independent directors help reduce potential agency costs (Fama, 1980; Fama and Jensen, 1983).

I also find that HPD ownership is positively related to state ownership, which suggests that state ownership helps align the interest of the HPD with the company via HPD shareholdings. However, the significance level of the coefficient of state ownership is only 10%. Moreover, the significance of the coefficient is very sensitive to the changing of the instrumental variables.

Board composition

Table 9.1 shows that the percentage of independent directors is positively related to board size. No significant relationships are found between board composition and HPD ownership, board duality, political duality, state ownership, legal ownership and foreign ownership.

The significant and positive relationship between the percentage of independent directors and board size is consistent with Mak and Li's (2001) findings, which indicate that these two governance mechanisms work as substitutes. It is worth noting that independent directors have only been introduced to Chinese listed companies

since 2001, so further research is needed on the effects of independent directors on Chinese listed companies in the long term.

Board size

As Table 9.1 shows, board size is linked with both HPD ownership and political duality. No evidence is found of a link between board size and board duality, the percentage of independent directors, state ownership, legal ownership and foreign ownership.

In the simultaneous model, board size is negatively linked with HPD ownership, which suggests that HPD ownership helps to control board size. However, as discussed earlier, HPD ownership in Chinese listed companies is usually very small and negligible, therefore the relationship can be explained the other way round, which is that a smaller board helps to increase HPD ownership, which further helps to align the interests between the HPD and the company.

Board size is negatively related to political duality, which suggests that political duality tends to have tighter control over board size. By contrast, board duality, which includes both CEO/Chair and CEO/Deputy Chair dualities, has no impact over increasing compensation or controlling the board size.

Firm value, HPD compensation, HPD ownership and board characteristics

The theoretical argument of the simultaneous model on executive compensation is that executive compensation, executive ownership, board characteristics and firm value are jointly determined. Table 9.1 shows that in the simultaneous model, board characteristics including board size and the percentage of independent directors have a big impact on firm value (Tobin's Q). I also find that firm value is significantly and positively related to firm size (lgasset). No evidence is found of a link between firm value and HPD ownership, political duality, board duality, state ownership, legal ownership and foreign ownership.

Specifically, I find that board size is negatively related to firm value, which indicates that a smaller board is more likely to increase firm value. This view is consistent with the findings of Yermack (1996). Lipton and Lorsch (1992) argue that agency problems increase with the number of directors because although boards' capacities to monitor could increase with board size, the benefits could be outweighed by such costs as slower decision-making, less candid discussions of managerial performance and biases against risk-taking. In support of this view, Yarmack (1996) finds evidence that companies achieve the highest market value when boards are small. In addition, smaller boards are more likely to dismiss CEOs following periods of poor performance. Similarly, evidence shows that CEO compensation exhibits greater sensitivity to performance in companies with small boards.

The negative relationship between board size and firm value suggests that smaller boards are more effective, therefore are associated with higher firm value. This implies that Chinese listed companies may increase their firm value by keeping a tight control over board size. Lipton and Lorsch (1992) recommend limiting the board membership to 10 people, with a preferred size of 8 or 9. Jensen (1993) also points out that when boards get beyond 7 or 8 people, they are less likely to function effectively and are easier for the CEO to control. As discussed in chapter 7, the average board size in my sample is between 9 and 10 during 1998 and 2001, which is relatively small compared to US companies. For example, Yermack (1996) finds the average board size was between 12 and 13 during 1984 and 1991. The smaller board size may be due to the fact that Chinese companies have a relatively shorter history and boards of directors were only introduced to Chinese companies in the 1990s, therefore there has not yet been enough time for the board to ‘accumulate’ to a large size.

In addition, I find that the percentage of independent directors is positively associated with firm value, which indicates that independent directors help to improve firm performance. The result suggests that a higher percentage of independent directors is associated with higher firm value, which is consistent with agency theory (Dalton et al., 1998). From the agency perspective, board independence has focused on the role of independent directors in limiting the potential agency costs when decision-making and decision-control are separated. It is argued that by monitoring

management, outside directors can limit the exercise of managerial discretion, thus lowering contracting costs between shareholders and management (Fama, 1980; Fama and Jensen, 1983). Fama and Jensen (1983) also argue that outside/independent directors have an incentive to act as monitors of management because they want to protect their reputations as effective independent decision-makers.

An implication for Chinese companies is to increase the number of independent directors. However, two points need to be considered. Firstly, independent directors were only introduced to Chinese listed companies by the CSRC (China Securities Regulation Committee) in 2001. Before 2001, there was only a small number of companies which introduced independent directors. Therefore further study on the effects of independent directors is needed for companies in a longer time period. Secondly, the real ‘independence’ of the independent directors has been questioned by academic researchers in China (Guo and Jiang, 2003). On the one hand, they argue that independent directors are from outside the company and are not familiar exactly with the business and operations of the company, therefore they make judgments and decisions completely based on information provided by insiders of the company. On the other hand, independent directors in China are always recommended by large shareholders, and they tend to choose famous academics and entrepreneurs who do not have enough time and energy to attend various board meetings and carry out their duties (Guo and Jiang, 2003).

I also find that firm value is significantly and positively related to firm size, which is measured by the logarithm of total assets. The result suggests that large companies have a higher market-to-book value (Tobin's Q) than small companies. A possible reason is that large SOEs always tend to have more support from the government, such as access to bank loans with favourable terms, which is not available to small companies.

Overall, the empirical results of the simultaneous model show that Chinese corporate governance is in a transition period. The previous institutional regime such as political duality coexists with contemporary western corporate governance mechanisms such as small board size and independent directors. As Table 9.1 shows that independent directors and small boards work together as effective corporate governance mechanisms in Chinese listed companies. Specifically, small boards help to control HPD compensation, to align the interests between the HPD and the company and to increase firm value. Independent directors help to align the interests between the HPD and the company and to increase firm value. Political duality fails to control HPD compensation but has a tight control over board size.

9.6 Conclusion

In chapter 8, five hypotheses are empirically tested to evaluate the ability of the adapted managerial power model, tournament model and simultaneous model to

explain the observed executive compensation data in my sample of Chinese listed companies between 1998 and 2001. This chapter presents the interpretation of the empirical results in chapter 8 by linking the results to research hypotheses, previous literature and Chinese institutional background.

All three models have been adapted to the Chinese business context and are broadly supported by my sample of Chinese data. The results are consistent with Lambert et al.'s (1993) argument that executive compensation is most appropriately characterized by a combination of these models, rather than being completely described by a single theoretical model. A summary of research the hypotheses and findings, contributions, implications and limitations of this study is presented in the next chapter.

Chapter 10 Conclusion

10.1 Introduction

Executive compensation has become a controversial topic in the media and in the area of practice and academic research in China since the 1990s. Similar to the western literature on executive compensation, most research on executive compensation in China focuses on the relationship between pay and performance from the perspective of agency theory. The objective of this research is to investigate the structure and determinants of executive compensation in Chinese listed companies from three under-researched perspectives: the managerial power theory, tournament theory and simultaneous framework. This thesis provides not only empirical evidence for academic research on executive compensation in China, but also has important implications for practitioners and policy makers in China.

The remainder of this chapter is organized as follows: section 2 reviews the research questions and research hypotheses. Section 3 summarizes the research findings. Section 4 highlights the contributions of this study. Section 5 discusses the implications for both policy makers and academic research. Section 6 discusses the limitations of this study and future research agenda, followed by a conclusion in section 7.

10.2 Research Questions and Hypotheses

This thesis studies the structure and determinants of executive compensation in Chinese listed companies. More specifically, this thesis answered 4 research questions:

1. What is the influence of executive power on executive compensation in Chinese listed companies, based on the perspective of the managerial power model?
2. Does the organization compensation structure for executive directors in Chinese listed companies follow the tournament model? Can compensation structure based on the tournament model improve firm performance in Chinese listed companies?
3. How do executive compensation, executive ownership and board characteristics affect each other and how do these factors eventually affect firm value in the simultaneous model in Chinese listed companies?
4. Do factors such as political influence and government ownership influence executive compensation in Chinese listed companies?

The first 3 questions are based on the managerial power model, tournament model and simultaneous model respectively. These models have been adapted to fit with the Chinese context. In order to answer these research questions, five research hypotheses

have been developed based on the adapted models:

Hypothesis 1: the level of executive compensation is positively related to the level of executive structural power (H1a) and the level of executive political power (H1b) in the Chinese listed companies.

Hypothesis 2: in Chinese listed companies, the pay difference between the highest paid director and the second highest paid director is bigger than the pay difference between the second highest paid director and the third highest paid director, but the difference between the two is not big enough to be a convex relationship (H2a). Moreover, higher state ownership would further reduce the pay difference between organization levels (H2b).

Hypothesis 3: the relationship between the executive pay gap and the number of contestants is weak in Chinese listed companies (H3a) and higher state ownership would further weaken the relationship (H3b).

Hypothesis 4: corporate performance is positively related with the executive pay gap (H4a), especially in less government-controlled Chinese listed companies (H4b).

Hypothesis 5: Executive compensation, managerial ownership, board characteristics and firm value are jointly determined in Chinese listed companies.

The above 5 hypotheses have been tested using quantitative methods. The data sample contains 71 Chinese listed companies with a continuously full disclosure of individual directors' compensation from 1998 to 2001. Two datasets were used in the data analysis: the first dataset includes the 779 top 3 highest paid directors in the 71 Chinese listed companies. The second dataset includes the 284 highest paid directors in the 71 Chinese listed companies. This first dataset was employed to examine research hypotheses 1 and 2. The second dataset was employed to test research hypotheses 3, 4 and 5. Three regression methods were employed: robust regression with standard errors clustered by firm, fixed-effects or random-effects models and Three-stage Least Squares (3SLS). The results from the different methods were compared and analyzed.

10.3 Summary of Research Findings and Discussion

All five hypotheses were generally supported by the data analysis, which has been discussed in chapters 8 and 9. This section summarizes the key empirical findings of the managerial power model, tournament model and simultaneous model.

10.3.1 Research findings of the managerial power model

The relationship between managerial power and executive compensation has been examined. Hypotheses 1a and 1b were largely supported by the sample of Chinese

listed companies. Two managerial power dimensions (structural power and political power) were developed in the managerial power - compensation models. The following empirical results were discovered. Firstly, executive compensation was positively related to executive structural power, which is measured by executive ownership. Executive ownership was used as an indicator of executive structural power because the Chinese government allocates shares to the CEO based on his/her rank in the managerial hierarchy. Secondly, executive compensation was positively related to executive political power. The result suggests that executive political power (political duality) has a significant impact on executive compensation in Chinese listed companies. This reveals the direct and strong government influence on executive compensation in Chinese listed SOEs. The results were consistent for both robust regressions with standard errors clustered by firm and the fixed-effects model.

10.3.2 Research findings of the tournament theory

Hypotheses 2a, 2b, 3a, 3b, 4a and 4b are based on the tournament theory and have been adapted to the Chinese context. Hypotheses 2a, 2b 4a and 4b were both supported by the Chinese datasets in this study, whereas no evidence was found to support hypotheses 3a and 3b.

Firstly, the research findings show that the pay difference between the highest paid director and the second highest paid director was bigger than the pay difference

between the second highest paid director and the third highest paid director, but the difference between the two was not big enough to be a convex relationship (H2a). It also shows that higher state ownership would further reduce the pay gap between the different levels (H2b). This study also revealed that the pay differential of the HPD to the next lower level was much smaller than in developed countries such as the UK and US (Main et al. 1993; Conyon et al. 2001).

Secondly, no evidence was found to support hypotheses 3a and 3b, which state that the executive pay gap increases with the number of contestants. This result is not surprising because cash is not the only form of reward; instead, political promotion is another important reward for top managers in Chinese listed companies. Therefore the need to increase the cash prize to attract more contestants is weak. The results were consistent for both robust regressions with standard errors clustered by firm and the random-effects model.

Thirdly, the research findings show that firm value (Tobin's Q) was positively related with the executive pay gap (H4a), especially in less government-controlled Chinese listed companies (H4b). No relationships were found between executive pay gap and firm performance when firm performance was measured by ROA and EPS. Many researchers argue that valuations of assets are subject to management discretion (Firth, et al., 2006), therefore ROA is not a good measure for firm performance. EPS tends to be a biased measure of firm performance as well because the majority of the

shares in Chinese stock markets are non-tradable.

Main et al. (1993) and Eriksson (1999) also investigate wage compression issues. However, they both fail to support the notion of wage compression as an empirically important consideration at the top of the corporation. Since the data on the measurement of board interdependency was unavailable, the importance of wage compression could not be examined in this study. The wage compression and board interdependency issues are open for future research.

10.3.3 Research findings of the simultaneous model

Unlike previous studies on executive compensation in China which employed the OLS method and treated managerial ownership and board characteristics as exogenous variables (Chen 2006; Firth et al. 2006; Firth et al. 2007; Li et al. 2007), this study is explicitly based on the notion that executive compensation, executive ownership, board structures and firm value are all endogenous variables and interact with each other in a company. This study used three-stage least squares, which produced more insightful and efficient results than OLS regression. The results were consistent with hypothesis 5 that executive compensation, managerial ownership, board characteristics and firm value are jointly determined in Chinese listed companies.

In the simultaneous model, I find that board characteristics work as effective corporate governance mechanisms in monitoring HPD compensation in my sample of Chinese listed companies. Firstly, board size was positively related to HPD compensation, negatively related to HPD ownership and negatively related to firm value. All the results were consistent with agency theory, which argues that a smaller board is more effective in monitoring executive compensation, aligning interests between the director and the company and increasing firm value (Jensen, 1993; Yermack, 1996; Core et al., 1999).

Secondly, the percentage of independent directors was positively related to HPD ownership and firm value, which is consistent with agency theory, which argues that independent directors help to align the interests between the HPD and the shareholders and to increase firm value (Dalton et al., 1998).

Thirdly, previous literature on compensation and duality produces inconsistent results. For example, Chen (2006) finds similar results that executive compensation is positively related to CEO/Chair duality. By contrast, Li et al. (2007) find no relationship between CEO/Chair duality and CEO compensation. In this study, I argue that the inconsistency of previous empirical results might be due to the fact that previous research ignored the other more powerful duality in Chinese boards of directors - Party Secretary/Chair duality. Moreover, previous research ignored the endogenous nature of board characteristics and executive compensation. In support of

the above argument, the research findings show that HPD compensation was positively related to Party Secretary/Chair duality, which is consistent with the findings of the managerial power theory. Board size was also negatively related to political duality, which suggests that political duality could be an effective governance mechanism in monitoring board size in Chinese listed companies.

10.4 Contributions

The purpose of this study is to investigate executive compensation in Chinese listed companies from the perspective of three under-researched theories: the managerial power theory, tournament theory and simultaneous model. The main contributions of this study are discussed below.

Firstly, this thesis makes both theoretical and empirical contribution to the managerial power model of Grabke-Rundell and Gomez-Mejia (2002). This study is the first one to test the managerial power model in Chinese listed companies. Moreover, based on the special Chinese institutional background, a new power dimension (political duality, referring to the duality of Chairman/Party Secretary) has been developed and tested.

Secondly, this thesis contributes to the small quantity of empirical literature on the tournament model. Most studies on the tournament model were conducted in Western

companies. This study is the first study to test all three propositions of the tournament model in Chinese listed companies. Moreover, the tournament model has been modified to fit with the Chinese context.

Thirdly, this thesis contributes to the small quantity of empirical literature on the simultaneous model on executive compensation. Taking into account the Chinese context, this study extended the simultaneous model of executive compensation by adding 4 board characteristic variables (board size, board duality, board composition and executive political power/political duality) as endogenous variables. This thesis is the first study to explore the endogenous nature of executive compensation, executive ownership, board characteristics and firm value in a simultaneous model in Chinese listed companies.

Fourthly, this thesis explores not only the economic factors which affect executive compensation, but also the political and cultural factors which influence executive compensation in China. This study provides first-hand and comprehensive evidence to support the view that the Chinese government has great influence over listed companies in China.

Fifthly, previous studies on Chinese executive compensation (Chen, 2006; Kato and Long, 2008) used the average compensation of the top 3 highest paid directors to represent HPD/CEO compensation, which could have led to biased results. In this

study, the author manually collected the data on the compensation of each director, which covers the top three highest paid directors from 1998 to 2001. Compared with previous studies, the information is more accurate.

Sixthly, previous studies (Firth et al., 2006; Li et al., 2007) used a non-panel dataset which could have led to biased results. In this study, panel data with continuous individual directors' compensation data from 1998 to 2001 was used. Compared with non-panel data analysis, panel data helps to control unobserved firm heterogeneity, which produces more efficient and less biased results.

10.5 Implications

This study explores the structure and determinants of executive compensation in Chinese listed companies based on the managerial power model, tournament model and simultaneous model. This section discusses the implications of this study.

Implications of the three models were discussed in Chapter 9. A common finding of the managerial power model, tournament model and simultaneous model is that political influence on the structure and determinants of executive compensation in Chinese listed companies is strong, especially in those companies with high state ownership. For example, in the managerial model, it has been shown that 'political power' can greatly enhance executive compensation. In the tournament model, it has

been shown that the Chinese government has great influence over the structure of executive compensation in Chinese listed companies. In the simultaneous model, it has been shown that, compared with board duality (CEO/Chair duality and CEO/Deputy Chair duality), political duality (Party Secretary/Chair) has greater power in increasing HPD compensation and reducing board size, which also confirms the view that the Chinese government and the Chinese Communist Party have great influence over Chinese listed companies, especially on issues like executive compensation.

The great influence of the Chinese government on executive compensation in Chinese listed companies can be observed elsewhere. First, the government caps CEO compensation in many listed SOEs. For example, in Beijing, CEO compensation in SOEs is capped by no more than 9 times the workers' average pay (Beijing Morning Post, 28th December, 2007). More recently, 'the decision on executive compensation in SOEs' proposed by the Ministry of Human Resources and Social Security of China (MHRSS) also sends a clear message to cap executive compensation in SOEs (Yangtze Evening Post, 9th February 2009). Second, the government maintains a strong influence on the human resources in listed SOEs and offers a political reward to senior managers. In China, competent government bureaucrats are sent to run the SOEs and vice versa, which helps the government to keep a strong and direct political influence on SOEs. Third, recent legislative change also indicates that the government tends to further strengthen its relationship with all companies through trade unions. In

China, the All China Federation of Trade Unions (ACFTU) is the only officially recognized trade union, which is led by the Chinese Communist Party. The new Labour Law of China (2008) has greatly enhanced the power of the ACFTU and the ambitious goal of the ACFTU is to have branches in all Chinese enterprises by 2010 (The Economist, 31st July 2008).

Currently, the Chinese government acts as shareholder, regulator, supervisor, administrator and operator of SOEs at the same time, which could lead to many problems. For example, as discussed in the managerial power model, direct and strong government intervention in board decision-making could lead to politically-based decisions and further lead to poor firm performance in the long term. In the tournament model, it has been shown that the pay gap could stimulate firm performance. However, the effect could be weakened by higher state ownership. Moreover, the political rewards offered by the government could further distract executive directors, encouraging them to behave politically rather than try to improve firm performance. Other reported problem include a lack of liquidity of the secondary market, inefficient stock markets and the absence of effective shareholder monitoring (Chen 2001; Tenev and Zhang 2002; Chen 2006).

Therefore, there is a great need to further reduce political influence in Chinese listed companies. First, the government may need to monitor executive compensation in Chinese listed companies in order to reduce corruption and agency problems, but it

should not politically cap executive compensation by a certain times the average workers' pay, typically 3 to 15 times in China. In fact, capping executive compensation is a practice which reflects the equalitarian principle, a practice which could de-motivate CEOs but cannot motivate workers.

Second, the intervention of the government in human resources in Chinese listed companies should be further reduced. Currently, the power of decision-making is shared between Party Secretary, Chairman and CEO. The Party Secretary normally also serves as Chairman and has the power to recommend and appoint the CEO. As analyzed in Chapter 3, this system puts the Party Secretary in a dominant position, making the Party Secretary/Chairman the most powerful person in the management of the company. However, the performance of the Party Secretary is not appraised by working at firm performance. Instead, it is appraised by whether the party policies have been successfully implemented in the company. In other words, the Party Secretary/Chairman has the power to manage the company, but he or she may not have the motivation to do it. A possible solution is to separate the post of Party Secretary and Chairman, making the Chairman and CEO responsible for corporate governance and the Party Secretary responsible for party activities. Or, at the very least, appraise the performance of Party Secretary/Chairman by working at firm performance.

Third, as suggested by previous studies (Chen 2001; Tenev and Zhang 2002; Chen

2006), the government may need to gradually sell the state shares (which are currently un-tradable) to private owners in order to promote firm performance.

Fourth, it is worth emphasizing again that reducing political influence does not mean that the government can abandon its responsibilities to monitor and supervise. Without an appropriate monitoring system, autonomy and ownership reform could only lead to corruption and great harm to the interests of state shareholders and minority shareholders. The key point is that the government should differentiate carefully between ‘intervention’ and ‘supervision’.

The suggestions outlined above are for long-term based goals. Reducing political influence and selling state ownership is a long term process, which can only be achieved by further political reform – a process which is not at the top of the agenda for the Chinese government. So, what are the suggestions for the short or medium term goals?

As Table 9.1 shows, in the simultaneous model, firm value is positively linked with the percentage of independent directors and negatively linked with board size. In other words, increasing the percentage of independent directors and reducing the board size could be used as a mechanism to increase firm value. On the other hand, HPD ownership is positively linked with the percentage of independent directors and negatively linked with board size. In other words, increasing the percentage of

independent directors and reducing board size can increase HPD ownership, which helps to align the interests between the HPD and the company. HPD compensation is also positively linked with board size, which indicates that smaller boards can help to reduce compensation costs. Therefore, based on the above analysis, the suggestions for short and medium-term goals is to use more independent directors and further reduce board size in Chinese listed companies in order to improve firm value.

For the above suggestions to work, there are certain issues that need to be addressed. First, the problem of ‘real independence’. Many Chinese listed companies were former SOEs, and state ownership is in a dominant position. In such a system, because of the dominant position of state shares, the Party Secretary/Chairman, as the representative of state shares in the companies, could appoint all the independent directors. Li et al. (2003) argue that independent directors could become the ‘shadow directors’ of the Party Secretary/Chairman. Second, the problem of ‘expertise’. In China, there is also a tendency to appoint famous academics or entrepreneurs, who are friendly with or related to the company, to work as independent directors. However, some of them may not have the expert knowledge to offer constructive suggestions for the companies (Guo and Jiang, 2003). Therefore, when applying the practice of independent directors in China, great effort should be made to ensure that independent directors are really independent and that they have enough expertise to make constructive suggestions. Third, the ‘pay issue’. The pay for independent directors is a problematic area in China. On one hand, large companies offer big pay for their

independent directors to show off their financial power. On the other hand, some companies do not pay their independent directors. Li et al. (2003) argue that too much pay could affect independence and too little pay could reduce motivation. Both extremes are problematic. Therefore, they argue that there is a need to develop some standards on the pay for independent directors in China.

10.6 Limitations and Agenda for Future Research

This section concludes with a few limitations and an agenda for future research. Firstly, although I controlled for the executive directors' human capital characteristics including their age, gender and tenure, I was unable to include the directors' other characteristics such as education, work experience and prestige power, which are also supposed to have an influence over executive compensation.

Secondly, in the tournament model, the importance of wage compression cannot be examined in this study as the measurement of board interdependency was unavailable. The wage compression and board interdependency issues call for future research.

Thirdly, the data employed in this study includes all the companies (71 in total) with continuous full disclosure of individual directors' compensation between 1998 and 2001. The datasets include the 779 individual directors' compensation, shareholdings, age, gender and tenure were coded manually by the author. Data

employed by other researchers was either not continuous pooled data or used the average top 3 highest paid directors' compensation as the highest pay (Chen 2006; Firth et al. 2006; 2007; Li et al. 2007). Although this study has the most complete dataset, including continuous full disclosure for each individual director's compensation and human capital characteristics, the data sample is relatively small compared to the whole Chinese capital market. Therefore future study should collect a larger sample and retest the models, but this can only be achieved when the disclosure of executive compensation is improved in the future.

Fourthly, I mentioned in the last section that current literature only focuses on the cash compensation of top executive directors due to the unavailability of data. There are other kinds of compensation such as housing benefits, medical insurance, shares and options and other implicit compensation, which are not included due to the unavailability of data. Further research, especially qualitative research such as questionnaires and interviews of top managers in China, is needed in this area.

Finally, as discussed in chapter 8, although most results were consistent, the coefficients on some variables such as HPD ownership, state ownership and legal person ownership are sensitive to the changing of instrumental variables. Therefore the sensitivity of the simultaneous model to the changing instrumental variables should be addressed in future studies.

10.7 Conclusion

This chapter contains a review and discussion of the research questions, research hypotheses and main research findings. The main contributions and implications of this study have been explored. Finally, the limitations of this study and an agenda for future research have been discussed.

To improve the understanding and design of organizational incentive structures in Chinese listed companies, this thesis shed lights on executive compensation research from three under-researched theories: the managerial power model, tournament model and simultaneous model. All three models have been adapted to the special Chinese business context. The structure and determinants of executive compensation in China have been explored from the political, economic, social and cultural aspects. The research findings are fruitful and the empirical evidence suggests that executive compensation in China is most appropriately characterized by a combination of these models, rather than being solely described by a single theoretical description.

Appendix 1: Hypotheses - model table

Hypothesis 1: <u>the level of executive compensation is positively related to the level of executive structural power (H1a) and executive political power (H1b) in Chinese listed companies.</u>	Eq. (1)
Hypothesis 2: <u>in Chinese listed companies, the pay difference between the highest paid director and the second highest paid director is bigger than the pay difference between the second highest paid director and the third highest paid director, but the difference between the two is not big enough to be a convex relationship (H2a). Moreover, higher state ownership would further reduce the pay difference between different levels (H2b).</u>	Eq. (2)
Hypothesis 3: <u>the relationship between the executive pay gap and the number of contestants is weak in Chinese listed companies (H3a); and higher state ownership would further weaken the relationship (H3b).</u>	Eq. (3)
Hypothesis 4: <u>corporate performance is positively related with the executive pay gap (H4a), especially in less government-controlled Chinese listed companies (H4b).</u>	Eq. (4)
Hypothesis 5: <u>Executive compensation, managerial ownership, board characteristics and firm performance are jointly determined in Chinese listed companies.</u>	Eq. (5-6)

Appendix 2: Definitions of variables

1. W: individual cash compensation of the top 3 highest paid directors
2. hpdtot: cash compensation of the highest paid director
3. gov: government ownership = state ownership + legal person ownership
4. level1: organizational level 1 (the highest paid director)
5. LG1: level1*gov
6. level2: organizational level 2 (the second highest paid director)
7. LG2: level2*gov
8. WD: pay gap between HPD and the average executive team
9. WG: WD*gov
10. con: number of non-HPD executive directors
11. CG: con*gov
12. CVW: coefficient of variance of executive pay
13. CVG: CVW*gov
14. age: age of the executive directors
15. agesq: age square of the executive directors
16. tenure: tenures of executive directors
17. tensq: tenure squares of executive directors
18. gender: genders of the top 3 highest paid directors
19. hpdown: shareholdings of the executive directors in percentage of total shareholdings

- 20. board: board size
- 21. perindp: percentage of independent directors
- 22. perned: percentage of non-executive/unpaid directors
- 23. peraff: percentage of affiliated directors
- 24. duality1: CEO/chairman duality
- 25. duality21: CEO/deputy chairman duality
- 26. duality 2: CEO/chairman duality and CEO/deputy chairman duality
- 27. party: Party secretary/chairman duality
- 28. stateown: state ownership
- 29. legalown: legal person ownership
- 30. foreignown: foreign ownership
- 31. totasset: total assets
- 32. sales: total sales
- 33. eps: earning per share
- 34. roa: return on assets
- 35. Tobin's Q: firm value
- 36. location: company location
- 37. yriipo: years after initial public offerings
- 38. sdev: standard deviation of market return
- 39. debt: debt to equity ratio
- 40. Industry: industry classifications
- 41. Year: year dummies

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