Does One Size Fit All? A Study of the Simultaneous Relations Among Ownership, Corporate Governance Mechanisms, and the Financial Performance of Firms in China

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Abstract We draw on the many aspects of corporate governance examined in the developed economies and extend them to the Chinese environment. We find evidence of strong linkage and interdependence in the use of different control mechanisms. While there are significant relations between the governance control mechanisms and firm performance, these disappear when using simultaneous equation estimation. Our findings support the argument that governance control mechanisms are substitutes for one another and there is no one set of mechanisms that are optimal in maximizing firms' performances.

1 Introduction

Agency theory and the corporate governance literature identify and propose an array of devices and mechanisms that are demanded by investors (and other stakeholders) to help protect and enhance their investments (or other interests) from the self-interested motivations of managers. Examples include internal mechanisms such as carefully designed executive compensation contracts and the monitoring of managers by independent directors, and external mechanisms such as the market for corporate control and oversight by debt holders. Key mechanisms of an effective corporate governance framework identified by Keasey et al. (1997) are ownership (including institutional and managerial ownership), the board of directors (including board structure), CEO and directors' remuneration, auditing,

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information disclosure, and the market for corporate control. The Cadbury Report (1992) recommends that firms should adopt model codes of governance (best practices) and implement them to the fullest extent possible. Cadbury and other governance guidelines (e.g., the Peeters report in the Netherlands, the Vienot report in France, the SEBI report in India, and the OECD principles) provide checklists of desirable practices without weighting them by importance or detailing the interrelations among them.

There are now a plethora of studies that examine specific governance issues across many countries and institutional contexts. In many cases, these studies have used corporate performance as the dependent variable and then test the association with governance, broadly defined. The conclusions from these studies are a mixed bag. For example, Cubbin and Leech (1983) find a positive relation between ownership concentration and profitability, while Demsetz and Lehn (1985), after controlling for endogeneity, conclude that there is no significant relation between ownership and performance. Agency theory argues that carefully designed compensation contracts will align the interests of CEOs and investors. However, Jensen and Murphy (1990) find that the explanatory power of the CEO's pay for performance relation is very low in the U.S. and they argue this casts doubts on the descriptive validity of agency theory. To increase the effectiveness of the board of directors, agency theory argues in support of outsider representation on the board and the separation of the CEO/chairman positions. Dalton et al. (1998) in a meta-analysis of studies relating to board effectiveness (CEO duality and the insider/outsider proportion of the board) conclude that these two aspects of governance have no direct relations with firm performance. Heracleous (2001b) concludes that studies have failed to find any convincing connection between the 'best practices' in corporate governance and organization performance. Although agency theory provides a theoretical basis for corporate governance mechanisms and helps to explain the one-to-one relations between corporate governance constructs and firm performance, its descriptive validity is weak. This is due to firms operating under the influence of many governance mechanisms, and agency theory alone has limited ability in predicting optimal relations among corporate governance mechanisms and performance (Turnbull 1997).

A number of recent studies take a contingent view of the firm. Researchers have investigated the mutual relations among corporate governance mechanisms and the relations between these mechanisms and firms' performance (Lehn et al. 2007). This research argues that examining governance mechanisms in an isolated context is not effective. Rediker and Seth (1995) examine the linkages between governance mechanisms and suggest that the mechanisms operate as substitutes and work simultaneously in the firm. Barkema and Gomez-Mejia (1998) argue that we must not ignore the influence of a firm's governance structure and various contingencies when studying the CEO pay and performance relationship. Coles et al. (2001) argue that firms have the ability to choose among different governance mechanisms and firms are able to create an appropriate structure given the environment in which they operate. Thus, each firm has unique characteristics and so the appropriate governance structure is unique.

The underlying assumption in this study is that corporate performance, ownership structure, and corporate governance are interrelated. There is a trade off between

ownership patterns and governance control factors to achieve a firm-specific optimal structure that increases firm value. The argument that governance mechanisms are substitutes for one another and the selection of the specific mechanisms depends on the individual firm has been made previously in U.S. studies (Rediker and Seth 1995; Barkema and Gomez-Mejia 1998; Lehn et al. 2007). Coles et al. (2001, p. 23) state "Our view is that the most critical issue still to examine is the ability of firms to choose among a number of different governance mechanisms in order to create the appropriate structure for that firm, given the environment in which it operates".

We believe the ownership and corporate governance structure of a particular firm reflects the trade-off between costs and benefits for that firm (Linck et al. 2008) and so corporate governance mechanisms vary across firms. Thus, there is likely to be no empirical cross-sectional relations between ownership or board structure and firm value once interdependencies are taken account of. Although we acknowledge the conceptual trade-off between costs and benefits of various governance mechanisms, we cannot explicitly measure them for individual firms. The fact that there is little consensus in the results from numerous empirical studies in Europe and the U.S. on what constitutes the important governance variables in explaining firm profitability (Dalton et al. 1998; Coles et al. 2001; Keasey et al. 1997; Lehn et al. 2007) is testament to the substitutability and endogeniety of ownership and boardroom structures.

The main motivation for this paper is to examine whether there is one set of governance mechanisms that is appropriate for listed firms in China (i.e., one size fits all). We use the simultaneous equation method to investigate the interrelations among ownership structures, governance control mechanisms, and firm performances for a sample of privatized firms listed on China's stock market. China has an embryonic corporate governance system that is borrowing concepts from industrialized nations including, notably, the U.K. and the U.S. Whether these governance mechanisms are appropriate for China at this stage is an open question. The share ownership structure and legal system are far different in China than in other countries and this presents unique challenges for corporate governance. A major distinguishing feature of China's economic landscape is that despite moves towards a market economy, the government still has strong influence over the corporate sector and this is likely to be the case in the foreseeable future. Another important consideration is weak law enforcement and capricious legal decisions that make property rights more uncertain and governance mechanisms less effective (Chen et al. 2006b). Whether the unique ownership characteristics in China render western-style corporate governance irrelevant, is an empirical matter.

We investigate the following issues in the context of China: (1) the interrelations among the governance devices; (2) the relations between firm value and the governance systems; and (3) whether the governance mechanisms are substitutes for one another such that there is no single or subset of mechanisms that stand out as the precursors to good financial performance.

The paper is organized as follows. Next, we provide an overview of the institutional environment in China, including a description of the privatization process, ownership structure, and external and internal governance. We then present a brief overview of the recent governance literature from the U.S. and Europe and discuss

the interrelations among governance mechanisms. The research design introduces the sample and the simultaneous equation models we use, together with a description of the variables. The results section focuses on the interrelations among the governance variables and discusses the simultaneous equation model results. Finally, the discussion and conclusions section draws the results together and describes the policy implications.

2 Institutional Environment

China embarked on major economic restructuring in the late 1970s and the process of reform continues to this day. The aim of these reforms were, and still are, to improve economic efficiency, stimulate growth and innovation, increase competitiveness, and, ultimately, to improve people's welfare. In general, the reforms are aimed at moving China away from a centrally-planned economy to a more market-based approach similar to, but not identical to, the capitalist-style economies of Western Europe and North America. The institutional environment in China is substantially different from those of developed economies.

2.1 Reform and Ownership Structure

The privatization of state owned enterprises (SOEs) is a major component of the economic reform process in China. Although the privatization of SOEs is a worldwide phenomenon, there are some characteristics unique to China. For example, a majority of the shareholdings of privatized firms remain under the control of the government and its various agencies.

Research shows mixed results about the economic gains associated with privatization in different parts of the world. On the one hand, Megginson and Netter (2001) and Shleifer (1999), among other researchers, advocate the privatization of SOEs as this helps to clarify property rights and hence reduce agency costs. On the other hand, Wright et al. (1998) conclude that privatizations in Poland and Russia have not achieved the gains that were expected and Chen et al. (2006a) show that privatization has not improved enterprise efficiency in China.

A listed company in China is typically owned by five groups of shareholders. They are the state, legal persons (or institutions), employees, individuals (for A-shares), and foreign investors (for B-shares). State shares are shares owned by the government. Legal person shares are owned by domestic institutions such as corporations and financial institutions. A- and B-shares are tradable shares that are mostly held by individuals. A-shares are owned by locals and B-shares are owned by foreign investors. Other foreign shares include H-shares and N-shares and these are traded on the Hong Kong and New York stock exchanges, respectively; only a small number of firms have made such issues. Employee shares are offered to

employees and are eventually convertible to tradable A-shares after a short lock up period.

The government still maintains a strong influence over the economy. The central government and the local governments own the state shares, and the ultimate control of these shares is in the hands of the State Council. In many cases the government is the major or controlling shareholder of listed firms. The government also retains control over the appointment of senior management in many companies. Domestic corporations and financial institutions own the legal person shares although the ultimate owner of the domestic corporations and financial institutions is often the regional or local government or a state ministry. On average, the government, legal person, and tradable shares, each own about one-third of the total outstanding shares, although there is a great deal of variability across firms.

2.2 External and Internal Corporate Governance Mechanisms

Mergers and takeovers (or threats of mergers and takeovers) can be effective disciplinary devices used against poor management. However, most mergers of large state-owned enterprises in China are engineered by the state, and government approval is necessary for all such activity (Chen et al. 2008). Thus, mergers and acquisitions are often done at the behest of central or regional government in order to achieve socio-political objectives or to prop up ailing businesses. Any mergers and acquisitions of state owned enterprises typically do not affect the job security of managers and so the discipline imposed by an active market for corporate control is absent. An ineffective managerial labor market is another characteristic in China. Managers are not hired and fired as happens in western countries. For example, although individual competence and performance are becoming more important (Firth et al. 2006b), political standing still ranks as an important criterion in promoting senior ranking staff; it is very difficult to be promoted to a senior business position unless the individual is a Communist Party member (Gan and Lu 1997).

Privatization of SOEs gives managers a lot more autonomy and so the agency costs inherent in the separation of ownership and control can escalate. In order to reduce these agency costs, China introduced corporate governance rules, which borrow heavily from the U.S., Britain, and elsewhere. The "*Code of Corporate Governance for Listed Companies in China*" was issued in late 2001 by the China Securities Regulatory Commission (CSRC – the regulator of listed firms) and the State Economic and Trade Commission (SETC). The code is very influential and is enforced by the CSRC. The boards of directors of listed firms ostensibly have similar responsibilities and functions as their western counterparts. In particular, independent non-executive directors are supposed to monitor the actions of top managers, offer independent advice on business matters, and act in the best interests of shareholders. Duality of the chairperson and CEO positions, where both are held by the same person, leaves a lot of power in the hands of one individual. Since 1998,

China's regulatory authorities have discouraged duality but some firms still have a joint chairperson and CEO.

Compensation policies can also be used to reduce agency costs. For example, the compensation of the top executive can be designed so that the executive has incentives to maximize stockholder wealth. One way to do this is to introduce stock options for the CEO and top management. So far, China has not gone down this road, in part, because the state controls the issue of new shares. Instead, CEO cash compensation includes bonus pay that is related to performance; note, however, that this breakdown of base pay and bonus pay is not always disclosed by firms (Firth et al. 2006a) and this is a limitation in compensation studies in China.

3 Literature

This section provides a brief review of the role of ownership and other corporate governance mechanisms in controlling agency conflicts within the firm. It draws heavily on empirical research using U.S. data. We discuss the individual significance of ownership and corporate governance mechanisms as monitors of firm performance. The section concludes with a discussion of the interrelations among ownership, governance mechanisms, and firm performance.

3.1 Theory and Practice

There are various theoretical or conceptual studies of ownership, corporate governance, agency costs, and firm performance. Examples of these studies include Jensen and Meckling (1976), Adams and Ferreira (2007), Rajeha (2005), and Harris and Raviv (2008). However, these studies examine small subsets of governance mechanisms (e.g., board structure) and there is no general equilibrium theory of board structure (Linck et al. 2008) or of governance in general. At the practical level, a variety of governance guidelines have been introduced in different countries and these often carry quasi-regulatory status as they are typically required by stock exchanges. These guidelines are check-lists of ideal boardroom structures and they do not consider the costs involved and do not discuss substitution or complementary effects.

3.2 Ownership

The type of ownership structure a firm has may have an impact on a firm's performance and internal governance mechanisms. Research has examined managerial ownership (Tosi et al. 1997), founding-family ownership (Anderson and

Reeb 2003; Villalonga and Amit 2006), blockholders, institutions, (Shleifer and Vishny 1986), and shareholder concentration. Managerial ownership may help align the incentives of managers with those of the investors although higher ownership could lead to entrenchment. The incentive alignment and entrenchment arguments lead to different predictions on the relation between ownership and firm performance. Similar arguments apply to founding-family ownership. Blockholders and institutional investors can be a force for good by monitoring management although some may focus on short term rather than long-term performance.

3.3 Boards of Directors

Boards of directors are involved in solving the agency problems inherent in managing any organization (Finkelstein and Hambrick 1996; Faleye 2007; Linck et al. 2008) and there is a growing literature that considers the effect of board control on firm activities (Coles and Hesterly 2000; Westphal 1999; Boone et al. 2007). Some studies focus on the role of independent non-executive directors (Fama and Jensen 1983). In general, the evidence shows that outsider-dominated boards provide a form of control on firm activities. For example, outsider dominated boards are more likely to remove CEOs following poor performances (Hermalin and Weisbach 2000). However, some studies find that the presence of independent directors may actually harm performance or else have no impact at all (Peasnell et al. 2003). For example, Yermack (1996) and Agrawal and Knoeber (1996) find there are negative relations between the proportion of independent directors and performance. Other board structures that have been examined are CEO-chairperson duality (Faleye 2007) and board size (Linck et al. 2008). In review articles, Johnson et al. (1996) and Dalton et al. (1998) argue that there does not appear to be any substantial relation between boards of directors and performance and even if there is some, it will be of little practical import.

3.4 Managerial Compensation

Managerial compensation can be used to reduce the agency conflict between managers and shareholders by aligning their common interests. Agency theory argues that there should be a positive relation between CEO pay and financial performance, and empirical studies have sought to confirm this association. However, the research results have provided mixed conclusions (Jensen and Murphy 1990). Yermack (1996) finds that the pay-performance relation for CEOs decreases with board size, which suggests that small boards give CEOs larger incentives and force them to bear greater risk than do larger boards.

3.5 Debt

Corporate debt policy is a control mechanism that can reduce agency conflicts between management and shareholders, particularly the agency cost of free cash flow, as suggested by Jensen (1986). The cost of leverage plays a role in the control mechanism as it affects the manager's control and flexibility in making resource allocation decisions. For example, some form of control of cash flow relocates from the debtor to the lender, and managerial discretion over resources is reduced (Shleifer and Vishny 1997). There is some empirical support for the effectiveness of debt as a controlling device (Berger et al. 1997; Bathala et al. 1994). The negative side of debt is that bankruptcy risk increases and this is especially true in periods where lenders do a poor job in monitoring creditworthiness.

3.6 Market for Corporate Control

External market control mechanisms include takeovers, buyouts, and the legal protection of minority shareholders. When a firm is undervalued or poorly managed, external control mechanisms cause it to be vulnerable to market interventions and takeovers. Mikkelson and Partch (1997) provide evidence that takeover activities affect the intensity of managerial discipline. The executive labor market also serves as a control mechanism; for example, the threat of dismissal and replacement can serve as an effective control on self-interested behavior among top managers (Firth et al. 2006b).

3.7 Interrelations Among Ownership Structure, Control Mechanisms, and Firm Value

Ownership and corporate governance mechanisms and firm performance are interrelated. However, empirical evidence from the U.S. yields conflicting views on the relative importance of these relations. The mixed results are due, in part, to the substitutability of one corporate governance mechanism for another (Lehn et al. 2007). Moreover, these mechanisms are not without costs. For example, very high managerial ownership of common stock may lead to entrenchment problems and the significant use of debt financing may result in a substantial increase in the firm's bankruptcy risk and lead to underinvestment or to investment in risky projects. Very high institutional ownership may have significant costs as many of these shareholders are very concerned with the liquidity of their investment and this may induce short-term myopia in management (Hansen and Hill 1991).

Given the costs and benefits of the different control mechanisms, a number of studies focus on the interrelations among these variables and firm performance. There are alternative views on the relationships among ownership structure, control mechanisms, and firm value (Linck et al. 2008). One approach assumes that there is an optimal condition of ownership structure and control mechanisms that maximizes firm value. For example, many studies treat performance or firm value as a dependent factor of ownership structure and control mechanisms (Bathala et al. 1994; Qi et al. 2000).

Another approach treats ownership, control mechanisms, and firm performance as endogenously determined, and thus affecting each other. For example, Linck et al. (2008) argue that board structure may be the result of agency problems rather than a solution. Faleye (2007) states that firm attributes mediate the relation between duality and firm performance. Demsetz and Lehn (1985) provide evidence that the dispersion of shareholder ownership depends on the characteristics of the firms. Demsetz and Villalonga (2001) argue that the market succeeds in bringing forth ownership structures, whether diffuse or concentrated, that are appropriate for the firms they serve; any systematic relations between ownership structure and performance therefore disappears. Agrawal and Knoeber (1996) examine the use of seven ownership and control mechanisms. They show that the effect of a single mechanism alone disappears when all seven mechanisms are considered together. In their model it is assumed that alternative ownership and control mechanisms exist, and that the extent of their use is determined within the firm. The greater use of one form will induce the lesser use of the other, resulting in equally good performance. Rediker and Seth (1995) examine alternative control mechanisms and their results are consistent with the substitution hypothesis. In particular, they find that large shareholders, inside and outside directors, and the incentive effect of managerial shareholdings are substitute corporate governance mechanisms. Coles et al. (2001, p. 24) remark that "examining governance mechanisms in an isolated context is not a particularly effective way to study these issues". Empirically it has been shown that the choice of the level of a particular mechanism influences the level of the other mechanisms (Rediker and Seth 1995; Coles et al. 2001; Gillan, Hartzell et al. 2007). The appropriate mechanisms for a specific firm therefore reflect the tradeoffs between benefits and costs.

Three recent and well-cited studies find positive associations between corporate governance indexes (that encompass a variety of items) and firm performance using U.S. and international data (Bebchuk et al. 2005; Gompers et al. 2003; Klapper and Love 2004). However, it is not clear what causes what. In an attempt to investigate the causal relations between governance and firm value, Lehn et al. (2007) replicate the Bebchuk et al. (2005) and Gompers et al. (2003) studies but specifically address the endogeneity issue. Lehn et al. (2007) conclude that after controlling for endogeneity, no contemporaneous relation exists between corporate governance and firm valuation.

The basic argument of this paper is that there is no unique governance structure that is applicable to all firms (Heracleous 2001b) and this especially applies in China where industrial re-organization and market reforms have been swift and

substantial. A firm will seek a corporate governance structure to cope with the environment, and choose among substitute or alternative governance mechanisms. Thus the strict adoption of a prescribed set of governance mechanisms (e.g., Cadbury recommendations) is unlikely to be appropriate. While regression models may yield significant relations between performance and an individual governance mechanism in isolation, the causal relations may disappear when the endogeneity problem is controlled. We present our hypotheses in broad terms as follows:

Hypothesis 1: There is interdependence among various governance mechanisms and the choice of one mechanism will have an impact on the effectiveness of other mechanisms that are also adopted at the same time.

Hypothesis 2: Any systematic relations between ownership, governance structure, and firm performance will disappear in a simultaneous equation setting that captures the intricacies of the system.

4 Research Design and Data

4.1 Model

Given the interdependencies among the ownership and corporate governance mechanisms discussed above, a simultaneous equations approach is an appropriate methodology with which to examine their relations with company performance. A number of empirical papers use simultaneous equations methods to model the relations among corporate governance mechanisms, governance structure, and firm valuation in the U.S. Jensen et al. (1992) examine the simultaneous relations among insider ownership, debt, and dividend policies; Bathala et al. (1994) examine the interrelations among institutional ownership, managerial ownership, and debt; and Agrawal and Knoeber (1996) examine the interrelations among seven control mechanisms.

Based on the international literature, we identify major mechanisms that may be relevant to corporate governance control in China. These are institutional ownership, ownership concentration, capital structure (debt), board of directors' control, managerial compensation, and government. We do not include the market for corporate control and managerial labor market factors in our model as they have very limited presence in China. In addition, we do not include managerial ownership, as the proportion of managerial ownership is very small in China. Executive ownership is, on average, only a few thousand shares. Figure 1 offers a simplified representation of these various causal relations. For example, the owners can influence the structure of the board of directors and the board, in turn, may influence who buys shares (via their performance and decisions). Debt holders may be effective monitors of the firm but the monitoring controls in place may attract

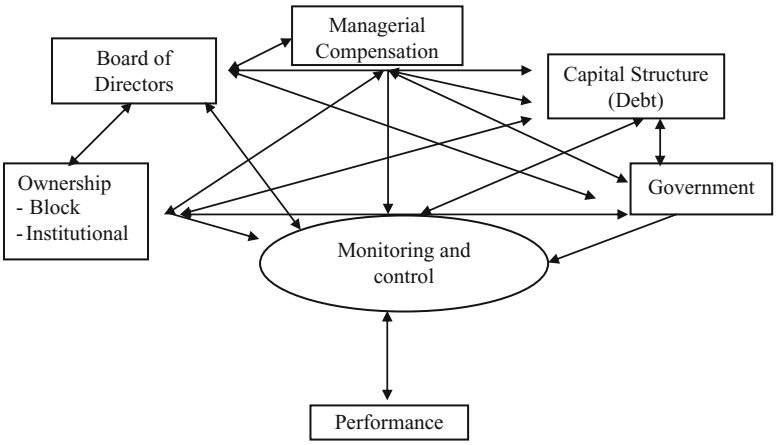

Fig. 1 Summary of relations. Building on the corporate governance literature and our knowledge of the commercial environment in China, we identify the key mechanisms of corporate governance control. These are institutional shareholdings, shareholding concentration, board of directors' control, managerial compensation, debt, and government. As government influence is so pervasive in China, we consider a government factor in our model. Each type of corporate governance mechanism is related to the others and so the use of each is determined endogenously. The figure shows the directional relationships

investors to lend to the firm. Our literature review expands on the two-way causality of the governance mechanisms. It is clear from the Figure that causality can proceed in either of two directions between each pair of variables, which justifies use of the simultaneous equation methodology to model the relations.

We develop a simultaneous equation model defined by Eqs. 1, 2, 3, 4, 5, and 6 to capture the interrelations among the six control mechanisms; the model is expressed as follows (justifications for the equations appear later):

$$\text{LSHARE} = f\{\text{HSF, DERATIO, INED, PAY, GOV, SIZE, RISK, FS}\} \quad (1)$$

$$\text{HSF} = f\{\text{LSHARE, DERATIO, INED, PAY, GOV, SIZE}\} \quad (2)$$

$$\text{INED} = f\{\text{LSHARE, HSF, DERATIO, PAY, GOV, BOARD, DUAL}\} \quad (3)$$

$$\text{PAY} = f\{\text{LSHARE, HSF, DERATIO, INED, GOV, SIZE, AREA}\} \quad (4)$$

$$\text{DERATIO} = f\{\text{LSHARE, HSF, INED, PAY, GOV, SIZE, AGE, AVROA}\} \quad (5)$$

$$\text{GOV} = f\{\text{LSHARE, HSF, DERATIO, INED, PAY, SIZE}\} \quad (6)$$

$$\text{ROA} = f\{\text{LSHARE, HSF, DERATIO, INED, PAY, GOV, SIZE, FS}\} \quad (7)$$

Equation 7 captures the relations between the control mechanisms and firm performance. To give some context to the ownership and governance factors, we relate them to an important objective of the firm, namely financial performance. In common with many studies, we use return on assets as our primary measure of a company's performance. To enable us to estimate the above system of equations using two-stage least squares (2SLS) procedures, we include the instrumental variables FS, SIZE, RISK, AGE, AVROA, AREA, BOARD, and DUAL in the model. These variables are defined in Table 1.

There are considerable differences in regional development across China's various provinces and municipalities and this can have an impact on a firm's performance. To control for this, we add a market development index (MINDEX) to each equation. MINDEX is a comprehensive index of the economic, legal, and institutional development of each region scaled from 0 to 10. The index is constructed by China's National Economic Research (NERI) Institute (Fan and Wang 2008). The MINDEX score for the region where the firm is located is used in the regressions.

Equation 1 captures the effect of institutional ownership (LSHARE). We use legal person shareholders (institutions, other SOEs) as a proxy for institutional shareholders. Although legal person shareholders are not identical to institutional shareholders seen in the west, they do have some common characteristics such as having the expertise to analyze and monitor firms. Moreover, legal person shareholders tend to be long term investors. Previous studies have found that firms with substantial legal person shareholdings are associated with better performance (Xu and Wang 1999; Qi et al. 2000) although there are dissenting views (Chen et al. 2009). We include the other five governance control variables (HSF, DERATIO, INED, PAY, and GOV) in the equation as the choice of LSHARE may depend on them. For example, the government may decide the number of legal shares issued by state-controlled listed firms. In addition, we also include RISK, FS, and SIZE in the equation.

The second equation relates to large shareholdings (HSF). To capture the effect of large ownership we use an ownership concentration factor. We include SIZE as an independent variable in the equation and expect that it will be positively related to concentrated shareholding. There is a greater incentive to control larger corporations in China and this leads to a more concentrated shareholding structure for ease of control.

To capture the board of directors control mechanism, we use board composition in the third equation of our model. Like prior studies (e.g., Dalton et al. 1998), we use the proportion of independent non-executive directors (INED) on the board as a proxy for board control. Prior to 2003, there was no mandated disclosure of which directors were independent and so we use information from the 2003/2004 annual reports (i.e., the names of the independent directors) to trace back the number of independent directors in the earlier years. As the proportion of independent directors is directly related to board size and may be the presence of a chairperson with a dual role as the CEO, we include these factors in the equation.

Table 1 Variable definitions and summary statistics

Variables		Definition	Mean	Median	Minimum	Maximum	Standard deviation
Performance variables							
Return on Assets	ROA	Return on assets adjusted by the median return of the industrial sector	−0.01	0.00	−0.10	0.04	0.01
Institutional ownership							
Legal person shareholdings	LSHARE	Proportion of legal person shares	0.23	0.14	0.00	0.75	0.24
Ownership concentration	HSF	Sum of the squares of the proportionate shareholdings of the three largest shareholders in the company	0.22	0.19	0.02	0.61	0.13
Board control							
Board composition	INED	Percentage of independent non-executive directors on the board	0.35	0.33	0.00	0.92	0.23
Incentive structure							
Compensation	PAY	We take the sum of the pay of the top three senior managers as the CEO compensation and PAY is the natural log of the cash compensation	12.70	12.77	10.36	14.69	0.88
Capital structure							
Long term debt ratio	DERATIO	Book value of long term debt/book value of shareholders' equity	0.16	0.06	0.00	1.77	0.24
Market control							
Government controlled firm	GOV	1 when the state holding is greater or equal to the next major shareholding	0.69	1.00	0.00	1.00	0.46
Instrumental variables							
Foreign shareholding	FS	1 when the company also issues B shares and/or H shares	0.08	0.00	0.00	1.00	0.27
Firm size	SIZE	the natural log of the book asset value of the company (millions)	7.25	7.17	5.28	9.81	0.83
Firm risk	RISK	Standard deviation of monthly returns on the firm's stock estimated from the monthly returns for the year	0.10	0.10	0.04	0.26	0.04
Firm age	AGE	Number of years since listing	7.04	7.00	1.00	17.00	3.17

(continued)

Table 1 (continued)

Variables		Definition	Mean	Median	Minimum	Maximum	Standard deviation
Average ROA	AVROA	Average ROA for 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006	−0.01	0.00	−0.07	0.02	0.01
Location	AREA	Places of registration. 1 for firms registered in developed areas, open cities, and coastal provinces.	0.57	1.00	0.00	1.00	0.49
Board size	BOARD	The number of directors on the board	9.59	9.00	3.00	19.00	2.19
Duality	DUAL	1 when the chairman also serves as the CEO (or the general manager)	0.09	0.00	0.00	1.00	0.09
The market development level in each province.	MINDEX	The market development level in each province	6.79	6.61	1.57	9.74	1.76

The AREAs = 1 include Guangdong, Fujian, Zhejiang, Liaoning, Jiangsu, Hainan, Shandong, Hebei provinces and Shanghai, Tianjing, Beijing cities.

Equation 4 deals with the managerial incentive variable (PAY). Managerial pay is a key factor in the principal-agent relationship (Tosi et al. 1997; Firth et al. 2006a). The exogenous variables are SIZE and AREA. The most consistent and enduring result from CEO pay studies is that firm size is positively and significantly associated with compensation levels (Conyon 1997). This pay-size relation is observed in all countries in which research has been conducted and in some cases, size is the only significant variable. The complexity of the job, the skills required, the number of hierarchical structures, and the ability to pay all point toward large firms paying their CEOs more. Furthermore, tournament theory (Bognanno 2001; O'Reilly et al. 1988) also predicts higher CEO pay in large firms. Living expenses and average wage costs in the coastal regions are much higher than in the interior. In particular, costs and wages are extremely high in Shanghai and Shenzhen, and are very high in the coastal regions where most of the export businesses are located. CEO salaries are therefore likely to depend on the location of the business (AREA). We use the aggregate pay of the three highest paid executives as the PAY variable. These three executives include the chairperson (the chairperson is an executive position in Chinese firms), CEO, and general manager of the firm.

Equation 5 deals with the capital structure (DERATIO). We use the debt-equity ratio as a proxy for capital structure. We expect that the debt level depends on the SIZE, AGE, and the profitability of the firm (AVROA). Strong government influence is pervasive in China, and to measure its effect on other control mechanisms and performance we include GOV in our system of equations (Eq. 6). In Eq. 6, we include SIZE as an exogenous variable as the government wishes to keep control over larger firms.

In addition to the interrelations among the control mechanisms within the system of six simultaneous equations, we also examine the relations between these mechanisms and performance. Equation 7 represents the performance and control mechanism relations. We model performance with two additional variables, SIZE and FS. Larger firms often enjoy preferential treatment and protection from the government, as well as greater scrutiny, and we capture this effect with SIZE. We include FS to capture the differences due to the presence of a foreign shareholder. The presence of foreign shareholders has been shown to enhance firm performance in transitional economies (for example, see Makhija and Spiro 2000).

4.2 Sample Description

The analysis is based on information from listed company annual reports over a 9-year period from 1999 to 2007. Annual reports are used as our source for the shareholding structure, board size, and board composition. The rest of the data including performance, operating risk, and state ownership is obtained from the China Stock Market and Accounting Research (CSMAR) database. In line with other studies, we exclude companies in the financial sector; note, however, that

there are only a few listed financial companies. There are 6,358 firm-year observations for our analysis. Table 1 provides summary statistics for the variables.

Performance statistics of the firm show that the mean industry adjusted ROA is −0.2 %, and it ranges from −9.8 % to 3.5 %. The average proportion of legal person shareholding is 23.3 % with a maximum of 75 %. The concentrated ownership factor (HSF) ranges from 2.3 % to 60.9 % with mean (median) values of 22.4 % (19.4 %). The proportion of independent directors is about 35.1 % in the sample companies and this is comparable to the ratio of non-executive directors on western boards.

The mean of the log of compensation payments to the three highest paid executives is 12.701 (328,000 RMB). The average long-term debt to equity ratio is 15.7 %. This ratio is low when compared to those of developed economies (Rajan and Zingales 1995). The mean value of GOV is 0.695, which indicates the state is the major shareholder in approximately 69.5 % of the sample companies.

Approximately 8.3 % of the sample companies issue shares to foreign shareholders. Our proxy for a firm's size is the natural log of book assets; the mean and median of firm size are RMB 1,415 million and RMB 1,300 million, respectively. RISK ranges from 4.2 % to 26.2 % and the mean of the 8-year AVROA is 0.2 %. The average board size is 9.6. There are relatively few cases of the board chairperson also holding the position of general managers (or chief executive officers).

5 Results

We first examine the relations among the control mechanisms and then examine the relations between firm performance and control mechanisms. Finally, we compare the results of Ordinary Least Squares (OLS) regressions with those of two-stage least squares (2SLS) regressions. Spearman and Pearson correlations and the associated p-values are shown in Table 2.

5.1 Relations Among the Control Mechanisms

We estimate Eqs. 1, 2, 3, 4, 5, and 6 as a system of linear simultaneous equations using the 2SLS method and the results are shown in Table 3. We control for clustering at the firm level, heterogeneity, and time series correlation using robust standard errors (Petersen 2009). We use the Sargan test to confirm the validity of our instruments, and the Hausman test to confirm there is no endogeneity issue in the two stage least squares regressions. The first equation shows that LSHARE is not significantly related to the other control mechanism variables. The coefficients on the exogenous variables SIZE and RISK are also not significant although they have the predicted signs. The second equation shows that the large shareholding

Table 2 Correlation coefficient matrix

	roa	lshare	hsf	ined	pay	deratio	gov	fs	size	risk	age	avroa	area	board	dual	mindex
roa	1	−02	.09**	.01	.27**	−09**	−05**	−02	.06**	−13**	−10**	.73**	.09**	.01	−02	.11**
		(.19)	(.00)	(.30)	(.00)	(.00)	(.00)	(.27)	(.00)	(.00)	(.00)	(.00)	(.00)	(.46)	(.13)	(.00)
lshare	−04**	1	−32**	.03*	−01	−07**	−48**	−06**	−22**	.06	−00	−06**	.04**	−02	.01	.09**
	(.00)		(.00)	(.04)	(.48)	(.00)	(.00)	(.00)	(.00)	(.07)	(.91)	(.00)	(.0')	(.11)	(.70)	(.00)
hsf	.10**	−24**	1	.05**	−11**	−04**	.33**	.01	.15**	−13**	−26**	.13**	−0'	−03*	−00	−07**
	(.00)	(.00)		(.00)	(.00)	(.00)	(.00)	(.54)	(.00)	(.00)	(.00)	(.00)	(.60)	(.02)	(.94)	(.00)
ined	.01	.03*	.04**	1	−09**	−06**	.07**	.04**	−06**	.00	−03*	.00	.08**	.10**	−01	.04**
	(.48)	(.02)	(.00)		(.00)	(.00)	(.000)	(.00)	(.00)	(.92)	(.02)	(.83)	(.00)	(.00)	(.71)	(.00)
pay	.22**	.00	−12**	−12**	1	.03*	−03*	.12**	.33**	.03	.23**	.32**	.28**	.09**	−08**	.4**
	(.00)	(.77)	(.00)	(.00)		(.01)	(.02)	(.00)	(.00)	(.07)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)
deratio	−06**	−05**	−03*	−04**	.01	1	.09**	.00	.32**	.02	.05**	−05**	−09**	.07**	.01	−08**
	(.00)	(.00)	(.05)	(.01)	(.40)		(.00)	(.81)	(.00)	(.16)	(.00)	(.00)	(.00)	(.00)	(.46)	(.00)
gov	.01	−50**	.31**	.06**	−04**	.05**	1	.04**	.15**	−09**	−07**	−00	−05**	.10**	−00	−11**
	(.34)	(.00)	(.00)	(.00)	(.00)	(.00)		(.01)	(.00)	(.00)	(.00)	(.94)	(.00)	(.00)	(.82)	(.00)
fs	−02	−08**	.00	.04**	.12**	.00	.04**	1	.20**	.01	.20**	−01	.17**	.05**	−02	.19**
	(.14)	(.00)	(.90)	(.00)	(.00)	(.82)	(.01)		(.00)	(.63)	(.00)	(.56)	(.00)	(.00)	(.27)	(.00)
size	.11**	−21**	.18**	−06**	.33**	.25**	.15**	.22**	1	−09**	.16**	.17**	.15**	.16**	−05**	.13**
	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)		(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)
risk	−11**	.02	−12**	.00	.01	.02	−09**	.00	−09**	1	.16**	−14**	−02	−06**	.06**	−01
	(.00)	(.23)	(.00)	(.99)	(.55)	(.18)	(.00)	(.91)	(.00)		(.00)	(.00)	(.08)	(.00)	(.00)	(.17)
age	−10**	−02	−26**	−04**	.24**	.05**	−07**	.22**	.15**	.16**	1	−09**	.15**	−02	−03*	.24**
	(.00)	(.23)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)		(.00)	(.00)	(.10)	(.04)	(.00)
avroa	.63**	−07**	.14**	−02	.29**	−04**	.05**	−01	.20**	−13**	−07**	1	.12**	.01	−03*	.15**
	(.00)	(.00)	(.00)	(.26)	(.00)	(.00)	(.00)	(.38)	(.00)	(.00)	(.00)		(.00)	(.37)	(.02)	(.00)
area	.08**	.05**	−00	.08**	.28**	−06**	−05**	.17**	.14**	−02	.16**	.12**	1	−04**	−01	.81**
	(.00)	(.01)	(.79)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.09)	(.00)	(.00)		(.00)	(.32)	(.00)
board	.02	−04**	−03	.10**	.08**	.03*	.10**	.06**	.18**	−05**	−03	.03	−05**	1	−04**	−02

(continued)

Table 2 (continued)

	roa	lshare	hsf	ined	pay	deratio	gov	fs	size	risk	age	avroa	area	board	dual	mindex
	(.06)	(.01)	(.07)	(.00)	(.00)	(.04)	(.00)	(.00)	(.00)	(.00)	(.06)	(.06)	(.00)		(.00)	(.09)
dual	−02	−00	−01	−00	−09**	.02	−00	−02	−05**	.08**	−03	−03*	−01	−04**	1	−04*
	(.08)	(.77)	(.53)	(.77)	(.00)	(.28)	(.82)	(.27)	(.00)	(.00)	(.06)	(.03)	(.32)	(.01)		(.01)
mindex	.09**	.10**	−06**	.04**	.41**	−06**	−10**	.20**	.14**	−03	.25**	.14**	.80**	−025	−04**	1
	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.06)	(.00)	(.00)	(.00)	(.07)	(.01)	

The numbers reported in the upper right diagonal are Spearman correlations and the numbers reported in the lower left diagonal are Pearson correlations
The numbers reported in the parenthesis are p values.

** $p < .01$

* $p < .05$

Table 3 Result of two-stage least square regressions of control mechanisms. Simultaneous equation analysis of ownership variables and other control mechanisms using the two-stage least squares method to estimate the following equations

Variable	LSHARE (Legal person share)	HSF (Ownership concentration)	INED (Board composition)	PAY (Compensation)	DERATIO (Long term debt ratio)	GOV (Government controlled firm)
Endogenous variables						
LSHARE		0.41	0.07	6.25	0.22	−1.41**
(Legal person share)		(1.21)	(0.28)	(1.16)	(0.55)	(−4.65)
HSF	−11.15		0.43*	−2.43	−1.34**	0.64*
(Ownership concentration)	(−0.03)		(2.27)	(−1.03)	(−2.96)	(2.05)
INED	−6.23	−0.66**		−0.15	−0.52	0.89**
(Board composition)	(−0.03)	(−3.07)		(−0.05)	(−1.34)	(3.13)
PAY	−2.15	−0.13**	0.01		−0.10	−0.05
(Compensation)	(−0.03)	(−3.64)	(0.26)		(−0.92)	(−0.92)
DERATIO	−24.88	−1.53**	−0.23*	−12.78**		0.16
(Long term debt ratio)	(−0.03)	(−4.76)	(−2.34)	(−3.60)		(0.27)
GOV	0.59	0.19	−0.26	−2.97*	−0.04	
(Government controlled firm)	(0.02)	(1.21)	(−1.41)	(−2.18)	(−0.20)	
Instrument variables						
FS	−0.89					
(Foreign shareholding)	(−0.03)					
SIZE	2.79	0.19**		2.04**	0.16**	−0.01
(Firm size)	(0.03)	(4.44)		(2.92)	(2.65)	(−0.03)
RISK	4.48					
(Firm risk)	(0.03)					
AGE					−0.01	
(Firm age)					(−1.34)	
AVROA					1.17	
(Average ROA)					(0.52)	

(continued)

Table 3 (continued)

Variable	LSHARE (Legal person share)	HSF (Ownership concentration)	INED (Board composition)	PAY (Compensation)	DERATIO (Long term debt ratio)	GOV (Government controlled firm)
AREA				−0.66		
(Location)				(−1.25)		
BOARD			0.02**			
(Board size)			(4.57)			
DUAL			0.02			
(Duality)			(0.47)			
Adjusted R^2	0.01	0.011	0.02	0.01	0.05	0.04

LSHARE = f {HSF, INED, PAY, DERATIO, GOV, SIZE, RISK, FS}
HSF = f {LSHARE, INED, PAY, DERATIO, GOV, SIZE}
INED = f {LSHARE, HSF, DERATIO, PAY, GOV, BOARD, DUAL}
PAY = f {LSHARE, HSF, INED, DERATIO, GOV, SIZE, AREA}
DERATIO = f {LSHARE, HSF, INED, PAY, GOV, SIZE, AGE, AVROA}
GOV = f {LSHARE, HSF, INED, PAY, DERATIO, SIZE}
Endogenous Variables = LSHARE, HSF, INED, PAY, DERATIO, GOV
Instrumental Variables = FS, SIZE, RISK, AGE, AVROA, AREA, BOARD, DUAL
These variables are defined in Table 1.
t-statistics in parentheses.
$^{**}p < 0.01$; $^{*}p < 0.05$

factor HSF has significant negative associations with independent directors, management compensation, and debt ratios. This implies independent directors and shareholder concentration are substitute governance mechanisms and shareholder concentration (HSF) is a monitoring device that substitutes for incentive compensation (PAY). HSF is also positively and significantly related to the exogenous variable, firm size.

In Eq. 3, where the ratio of the independent non-executive directors to total directors on the board (INED) is used as the dependent variable, we find that concentrated ownership (HSF) and debt ratio (DERATIO) are significant endogenous factors and board size (BOARD) is a significant exogenous factor. These results show that a board with a greater proportion of independent directors is positively related to concentrated ownership (HSF) and negatively related to the debt ratio (DERATIO). Therefore, a higher proportion of independent non-executive directors is used to offset concerns about entrenchment in highly concentrated ownership firms (that is, INED and HSF are complementary). In contrast, the percentage of independent directors (INED) and debt ratio (DERATIO) are substitute corporate governance mechanisms. The proportion of independent directors is positively related to board size (BOARD). Thus, larger boards have a greater proportion of independent directors.

In the managerial compensation equation, PAY is negatively related to the debt ratio (DERATIO). One possible explanation for this observation is that debt holders monitor the firm and inhibit the awarding of excessive management compensation. Managerial compensation (PAY) is negatively and significantly related to state ownership (GOV). Because of monitoring by the government there is less need for incentive compensation. As expected, firm size (SIZE) is positively associated with managerial compensation (PAY).

The capital structure ratio shows that the debt ratio is negatively related to concentrated ownership. When the share ownership is highly concentrated, firms have lower debt. So debt and highly concentrated ownership are substitute mechanisms to monitor the firm's management. Large firms have more debt. The large assets-in-place of big companies provide collateral against which banks and other debt holders will lend. The last equation is the influence of state ownership (GOV) on the control mechanisms. GOV is negatively related to the proportion of legal person shares (LSHARE) and thus they are substitute methods of governance. In contrast, GOV is positively related to concentrated ownership and the proportion of independent directors.

The above regression results show that governance mechanisms are interrelated and the choice of one mechanism depends on the choice of others. Taken as whole, these results support Hypothesis 1. To control for possible non-linear relations between ownership variables and other corporate governance variables, we also run the 2SLS regressions by including squared terms for the ownership variables in Eqs. 1, 2, 3, 4, 5, and 6. The introduction of squared ownership variables does not significantly change the results. We also include a control for the stock exchange where the firm is listed (China has two stock exchanges, Shanghai and Shenzhen). Inclusion of this control does not change the results.

5.2 Firm Performance and Control Mechanisms

In this section, we investigate the relations between the control mechanisms and firm performance. We do this because a major focus of China's economic reforms is to improve performance (Chen et al. 2006a). Before we recognize the endogeneity of corporate governance mechanisms, we estimate the regression of firm performance on individual control mechanisms. We also add the interaction term of government ownership (GOV) and the governance variable to the model to see if governance has a different impact on performance in state controlled listed firms. Table 4 shows the OLS regression estimates with return on assets (ROA) as the performance indicator. We choose ROA as the performance indicator because stock market measures of performance (stock returns) are subject to manipulation, rumor, and synchronicity (Morck et al. 2000).

The results show that LSHARE, HSF, PAY, and DERATIO are significant factors in the performance relationship. Lower legal share ownership (LSHARE), concentrated shareholdings (HSF), higher compensation (PAY), and lower debt (DERATIO) are all significantly associated with good performance. Our interpretation of the linear regression results is that many control mechanisms have an effect on firm performance when the interdependencies of the other control mechanisms are ignored. The interaction terms are mostly insignificant.

Following the approach used by Agrawal and Knoeber (1996), we enter all ownership and governance control factors into the model as shown in Eq. 7 and we present the OLS and 2SLS estimation results of the model in Table 5. The results for the pooled sample include firm year data from 1999 to 2007. We also sub-divide our sample into the 3-year period 1999–2001, and the 6-year period 2002–2007. Corporate governance guidelines came into effect in 2002 and we use this date to partition the sample. Table 5 shows that performance is related to LSHARE, HSF, INED, PAY, DERATIO, and GOV as well as the control factors SIZE and FS in the OLS regression. These results are similar to the results in Table 4. However, the significance of these factors disappears in the 2SLS estimation. The results support the argument that control mechanisms interact with each other. For example, GOV is significant and negatively related to performance in the OLS estimation and this result is similar to the findings of Qi et al. (2000) and Xu and Wang (1999). However, the government effect is not significant in the 2SLS estimation. Similarly, HSF and PAY are positively related to performance in OLS estimations as shown in Tables 4 and 5, but the significances of these variables disappear in the 2SLS estimation.

In summary, these results imply that ownership and other corporate governance mechanisms are endogenously determined. Each mechanism has its own costs and benefits and they differ across firms. Hence, they are likely to be unrelated to firm performance cross-sectionally and this is in line with the conclusions from previous studies (Agrawal and Knoeber 1996; Mak and Li 2001). The results support Hypothesis 2.

Table 4 The effect of individual control mechanisms on firm performance dependant variable = ROA

LSHARE	−0.01*					
(Legal person share)	(−2.10)					
LSHARE*GOV	−0.01					
	(−0.44)					
HSF		0.01**				
(Ownership concentration)		(5.47)				
HSF*GOV		−0.01†				
		(−1.95)				
INED			0.01			
(Board composition)			(0.45)			
INED*GOV			0.01			
			(0.55)			
PAY				0.01**		
(Compensation)				(13.51)		
PAY*GOV				0.00		
				(1.49)		
DERATIO					−0.01**	
(Long term debt ratio)					(−2.65)	
DERATIO*GOV					−0.00	
					(−1.40)	
GOV						0.001
(Government controlled firm)						(0.65)
SIZE	0.01**	0.01**	0.01**	0.01**	0.01**	0.01**
(Firm size)	(7.20)	(6.68)	(7.82)	(3.29)	(9.36)	(7.73)
FS	−0.01**	−0.01**	−0.01**	−0.01**	−0.01**	−0.01**
(Foreign shareholding)	(−4.57)	(−4.22)	(−4.46)	(−4.27)	(−4.63)	(−4.44)
MINDEX	0.01**	0.01**	0.01**	0.00	0.01**	0.01**
(Development level)	(6.83)	(6.86)	(6.55)	(1.13)	(5.87)	(6.61)
Adjusted R^2	0.02	0.03	0.02	0.05	0.03	0.02

To test the effect of individual control mechanisms on firm value, the OLS method is used to estimate the following equation:
ROA = f {{LSHARE, HSF, INED, PAY, DERATIO, GOV}, SIZE, FS, MINDEX}
MINDEX measures the market development level in each province.
The variables are defined in Table 1.
t-statistics in parentheses.
** $p < 0.01$; * $p < 0.05$; † $p < 0.1$

The sub-period results yield similar conclusions to the full-period results. While the OLS regressions (1999–2001, 2002–2007) show that ownership and governance factors are important in explaining firm performance, these effects disappear in the two-stage regressions. Although firms became more aware of corporate governance after 2001 following the publication of official guidelines, this has no impact on our general conclusion that there is no one optimal set of governance and ownership mechanisms.

Table 5 Coefficient estimates from OLS and 2SLS of firm performance on control mechanisms

Variables	1999–2007 2SLS	1999–2007 OLS	1999–2001 2SLS	1999–2001 OLS	2002–2007 2SLS	2002–2007 OLS
Dependent variable = ROA						
CONSTANT	−0.21	−0.06**	−1.04	−0.03**	−0.36	−0.07**
	(−1.54)	(−18.53)	(−0.14)	(−4.96)	(−1.00)	(−20.01)
LSHARE	−0.27	−0.01*	0.43	−0.00	−0.31	−0.01*
(Legal person share)	(−1.40)	(−2.21)	(0.12)	(−0.76)	(−0.26)	(−2.54)
HSF	0.18	0.01**	1.55	0.01**	−0.02	0.01**
(Ownership concentration)	(1.49)	(8.50)	(0.15)	(2.92)	(−0.11)	(7.90)
INED	−0.01	0.01**	1.20	0.00	−0.40	−0.00
(Board Compensation)	(−0.10)	(2.72)	(0.13)	(1.19)	(−0.40)	(−0.07)
PAY	0.04†	0.01**	0.09	0.01**	0.08	0.01*
(Compensation)	(1.77)	(15.03)	(0.15)	(4.89)	(0.49)	(16.59)
DERATIO	0.25	−0.01**	2.20	−0.01**	0.60	−0.01**
(Long term debt ratio)	(0.66)	(−4.72)	(0.13)	(−5.24)	(0.23)	(−2.96)
GOV	0.08	−0.01*	−0.19	−0.00	0.28	−0.01†
(Government controlled firm)	(0.87)	(−2.20)	(−0.15)	(−1.57)	(0.34)	(−1.88)
SIZE	−0.06	0.01*	−0.17	0.00	−0.11	0.01*
(Firm size)	(−1.07)	(2.49)	(−0.13)	(0.24)	(−0.27)	(2.55)
FS	−0.00	−0.01**	0.01	−0.00	−0.00	−0.04**
(Foreign shareholding)	(−0.77)	(−4.39)	(0.10)	(−1.33)	(−0.02)	(−4.62)
MINDEX	0.00	0.00	−0.02	−0.00	0.01	0.00
(development level)	(0.65)	(0.51)	(−0.15)	(−1.38)	(0.22)	(1.19)
Adjusted R^2	0.01	0.08	−0.01	0.06	−0.00	0.10

Simultaneous equation analysis of the ownership variables, other control mechanisms, and firm performance, using the two-stage least squares method to estimate the following equation:

ROA = f {{LSHARE, HSF, INED, PAY, DERATIO, GOV}, SIZE, FS}

Endogenous Variables = ROA, LSHARE, HSF, INED, PAY, DERATIO, GOV

Instrument Variables = FS, SIZE, RISK, AGE, AVROA, AREA, BOARD, DUAL, MINDEX

The variables are defined in Table 1

t-statistics in parentheses

** $p < 0.01$; * $p < 0.05$; † $p < 0.1$

6 Discussion and Conclusions

We draw together the many different aspects of corporate governance mechanisms that have been examined and reported in the literature and we investigate the interrelations among them. The six control mechanisms we examine are institutional ownership, concentrated ownership, debt financing, the proportion of independent directors to total directors, pay structure, and government influence. We investigate three issues using a data set of listed firms in China. Because China is rapidly transforming its state owned enterprises into modern corporations, it is imperative that studies be undertaken into the governance structures that are being put in place.

First, we hypothesize that there is interdependence among the various governance and control mechanisms and there are trade offs among the control mechanisms. We find strong evidence to show that substitution and complementary effects of the different governance mechanisms exist.

Second, firms are likely to choose an appropriate control mechanism to suit their own specific needs. We hypothesize that corporate control mechanisms vary across firms and the empirical results support our hypothesis. While in an OLS setting, we find that institutional ownership, large shareholdings, board independence, compensation, debt levels, and government control are significant factors associated with firm performance these results disappear when the inherent endogeneity is controlled for via the simultaneous equations methodology.

Third, we find that many of the control and governance mechanisms that influence performance in the developed economies also apply in China. One major difference in China is the significant share ownership by the state and its interventionist approach to the economy. Private investors have a limited role in the market as government has an overarching influence. Despite these characteristics, there are still alternative mechanisms for corporate control and firms in China can choose an appropriate structure to cope with their environment. The results contribute to our understanding of Chinese corporate governance systems in privatized firms.

What are the policy implications of these findings in the Chinese corporate control context? First, whilst previous research finds that firm performance and government ownership are negatively correlated (Xu and Wang 1999; Qi et al. 2000), we argue that, in the simultaneous choice of governance control mechanisms, the negative impact of government ownership will disappear. Our results support this argument. As ownership and other corporate control mechanisms are interdependent, models that only consider the influence of a single governance variable (say government ownership) on firm performance may be miss-specified. Heracleous (2001a, b) also argues that private ownership is neither a necessary nor a sufficient condition for superior performance. There is much debate going on in China about the need to reduce the government shareholdings in listed firms; if the argument for the reduction in government shareholding is to improve performance of these firms, such argument is debatable.

Second, our results indicate that there are no convincing absolute relations between corporate governance and firm performance. The Chinese government is working hard to incorporate a corporate governance ethos comparable to those in the developed economies. However, we demonstrate that governance structure has no direct relationship with firm performance. We believe the focus of any effective governance structure should be the protection of investors instead of the maximization of firm performance. Thus, legal reform involving the enactment of investor protection laws and, critically, effective legal enforcement are more important than merely following a set of "good governance practices" in a perfunctory way.

Finally, we must stress that the empirical results in this study are strongly dependent on the specification of the model and the choice of the instrumental variables. Unfortunately, existing theory does not provide us with a precise model specification. This means that although the simultaneous equation method allows us to interpret the interaction of the control mechanisms in the system, the results should be interpreted cautiously, and alternative models are always possible. Moreover, the results from this study and the substitution and complementary effects of the different governance mechanisms suggest that the theoretical considerations of the corporate governance issues are complex and relatively under-explored.

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