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Institutions, Board Structure, and Corporate Performance: Evidence from Chinese Firms

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Abstract

This paper investigates how institutional environment like property rights protection influences the size and composition of corporate boards, and further, how board structure impacts firm performance in China. Using a World Bank survey of 2,400 public and private firms across 18 Chinese cities, I find robust evidence that weaker helping hand from the government is associated with a higher number and proportion of outsiders on the board, after controlling for the effects of firm complexity, growth opportunities, CEO characteristics, ownership, and the potential endogeneity concern. Furthermore, the results show that when firms are operating in a weak property rights environment, more outsiders improve corporate performance.

JEL classification: G34; G3; K22; P3

Keywords: Corporate Governance; Property rights; Institutions; Board size; Board composition; Corporate performance; Corporate law

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1. Introduction

There is a growing acceptance of the view that a corporate board is an essential instrument in promoting corporate governance, firm performance and value. In theory, it helps to solve the agency problems inherent in managing an organization (Jensen, 1993; Hermalin and Weisbach, 2003). Earlier studies on the US firms suggest that smaller boards with a larger proportion of outsiders are optimal (e.g. Fama and Jensen, 1983; Lipton and Lorsch, 1992; Jensen, 1993; Yermack 1996; Hermalin and Weisbach, 2003). In this study, I am interested in the following questions regarding the size and structure of a corporate board, specifically in the context of China: What are the factors determining board size and board structure? What types of board size and structure will better promote board efficiency and corporate performance?

There exists an extensive theoretical and empirical literature on the impacts of board size and structure on corporate performance (e.g. Yermack, 1996; Campbell et al., 2001; Claessens et al., 2002; La Porta et al., 2002; Hermalin and Weisbach, 1998, 2003; Raheja, 2005; Adams et al., 2010). Until recently, however, there have been relatively few studies on the determinants of board structure (e.g. Boone et al., 2007; Linck et al., 2008; Coles et al., 2008; Lehn et al., 2009). Linck et al. (2008) find evidence that board structure across firms is consistent with the costs and benefits of the board's monitoring and advisory roles. In a similar vein, Coles et al. (2008) find that complex firms have greater advisory requirements than simple firms and thus have larger boards with more outside directors. On the other hand, R&D-intensive firms, for which the firm-specific knowledge of insiders is important, have a higher proportion of insiders on the board. Lehn et al. (2009) suggest that board size is directly related to firm size and inversely related to proxies for growth opportunities.

Economic growth and development literature has suggested that institutions are the fundamental determinants of income growth around the world, especially for countries in transition from a planned to a market economy (e.g. Acemoglu et al., 2002, 2005; Barro, 1990;

Beck et al., 2005a; Claessens and Laeven, 2003; Djankov et al., 2003; Johnson et al., 2002; La Porta et al., 1998, 2002; North, 1990). Of particular importance to economic development is the premise that institutions play an important role in securing property rights. Many studies show that property rights and contract enforcement influence corporate valuation, corporate decisions, reinvestment, R&D expenditure and thereby economic growth (e.g. Barro, 1990; Claessens and Laeven, 2003; Cull and Xu, 2005; Demirguc-Kunt and Maksimovic, 1998; Johnson et al., 2002; Knack and Keefer, 1995; King and Levine, 1993; La Porta et al., 2000; Mauro, 1995).

There is a striking paucity of studies, however, that have examined the effects of institutions on the size and composition of the company board, which is essential for the efficiency of the board, and thereby of corporate governance, firm value and long-run economic growth. Facing different institutional environments, the level of the protection of shareholders against the expropriation and entrenchment by managers varies significantly, which in turn affects the firm's needs for the monitoring and advising efforts put in by board of directors. Consequently, the institutions have direct impacts on the board structure. This paper tries to fill this void in the literature.

Since China began its enterprise reforms about two decades ago, many firms were privatized. It is therefore essential to understand the governance structure of the firms in China and also the relationship between governance structure and firm performance. Jiang and Kim (2014) provide a comprehensive and modern overview of corporate governance in China, and emphasize the importance to discuss governance features that are unique to China. Meanwhile, as the largest developing economy with the fastest economic growth, China lacks a well-developed legal and institutional environment. Do firms in China share the same board structure as firms in the western world? Does weak protection of property rights affect board characteristics? To facilitate the understanding to these questions, this study investigates the relationship between property rights protection and the size and structure of the corporate board, and the impact of board structure on board efficiency and firm performance in China.

The main data used in this paper comes from a World Bank survey of Chinese firms across 18 cities.[1] Following the recent literature on institutions (e.g. Johnson et al., 2002; Acemoglu and Johnson, 2005; Cull and Xu, 2005), I decompose institutions into two groups of firm-level variables that measure firms' perception of: 1) the extent of helping and/or grabbing hand of the government; 2) legal environment and the liability of contract enforcement. 'Helping hand' is measured by the senior manager's answers to the question: what percentage of government officials that your firm regularly interacts with are oriented towards helping, rather than hindering, firms? On the other hand, to measure contract enforcement I use one variable indicating whether a firm usually signs written contracts with its clients (*Contract enforcement*), which indicates managers' belief in the legal system and contract enforcement.

I find strong evidence that weak government helping hand (and/or strong grabbing hand)[2] is positively and significantly correlated with both the number and proportion of outsiders on the board after controlling for the effects of firm complexity, firms-specific information, CEO characteristics, ownership, and other variables. To be more specific, a one standard deviation decrease in government helping (grabbing) hand results in 7.38% increase (decrease) in the number of outsiders.

To build and substantiate the causal effects of institutions on board structure, I select instrumental variables by borrowing the idea from the literature on legal origin, colonial history and political connections. Specifically, I use *British administration* and *City population in 1918-1919* to measure legal origin and property rights protection a century ago in different Chinese cities, and *Party secretary dummy* and *Party deputy secretary dummy* to proxy for political connection. *British administration* is a dummy variable indicating whether the respective region was administered by Great Britain in the late Qing Dynasty (1884-1911). Following the spirit of Laeven and Levine

[1] The 18 cities range from developed coastal cities such as Shenzhen and Hangzhou to relatively backward cities such as Lanzhou and Guiyang, providing a rich sample of cities at different levels of institutional environment and board structure.

[2] Weak helping hand indicates strong grabbing hand from the government. These terms are used interchangeably in the paper.

(2009), and Lin, Ma, Malatesta and Xuan (2011a and 2011b), I also use industry-location median of the potentially endogenous variables (*Helping hand* and *Contract enforcement*) as the instruments. This strategy is widely used in the recent literature, such as Fisman and Svensson (2007), Laeven and Levine (2009), Lin, Lin and Song (2010), Lin, Ma, Malatesta and Xuan (2011a and 2011b). The argument is that if the endogeneity problem is specific to firms rather than industries or locations, then netting out this firm-specific component will provide a measure that solely depends on the characteristics pertaining to industries and/ or locations (Fisman and Svensson, 2007; Laeven and Levine, 2009). Detailed discussions of these instrumental variables are presented in Section 5.2.

The instrumental variables estimation suggests that the positive association between weak helping hand and the number and proportion of outsiders is consistent and robust. Furthermore, I find evidence that firms with weak property rights protection and more outsiders and listed firms with larger boards and more outsider directors have better performance.

This paper contributes to the literature in at least four ways. First, it is among the first attempts to provide evidence that institutional environment is an important determinant of the composition of board in addition to the commonly-used framework in the existing literature.[3] Through empirical analysis, I find robust and consistent evidence that the protection of property rights plays an important role in determining the board composition. Second, the paper provides evidence from both listed and non-listed companies. As nearly all of the literature has focused on the discussion of boards of publicly traded corporations due to data limitations, there is a lack of understanding of the board structure in private firms (Hermalin and Weisbach, 2003; Adams et al., 2010). This paper fills this gap. Third, it provides a new perspective of choosing possible instrumental variables and resolving the endogeneity problem in the selection of board structure and the relationship between board structure and corporate performance based on Chinese laws,

[3] Using a country-level measure of minority shareholder rights in Western European countries, Kim et al. (2007) find a positive correlation between minority shareholder rights and corporate board independence.

regulations and institutions. Finally, previous literature on Chinese corporate boards finds no relationship between the proportion of outsiders and firm performance (e.g. Bai et al., 2001). My findings, that firms facing weaker property rights protection with more outsiders and listed firms with larger boards have better corporate performance, complement such a view.

The results of this research have implications that are of potential interest to regulators, managers, shareholder activists, and investors, as well as to academic researchers. While there is an extended push by numerous international institutions, regulators and legislators towards a smaller corporate board with a greater proportion of outsiders,[4] my estimation results show strong relationship between board structure and property rights and firm characteristics, consistent with the notion of Coles et al. (2008) that any regulatory framework that imposes uniform requirements on board structure could be ill-conceived. More importantly perhaps, the interesting finding that firms with weak property rights protection and with more outsiders have better corporate performance will produce some guidelines for Chinese firms in choosing the appropriate board structure. Firms could go in this direction conditional on their heterogeneous characteristics. In addition, the result also sheds some light on firms in developing countries that are similar to China in terms of institutions and poor corporate governance.

The remainder of the paper is organized as follows. Section 2 describes briefly the institutional background of corporate governance system in China. Then Section 3 develops the conceptual framework and describes the research hypotheses. I present data and variable descriptions in Section 4, and then construct my empirical strategy and present the main empirical results in Sections 5 and 6. Concluding remarks are in Section 7.

[4] International institutions like International Monetary Fund (IMF), World Bank (WB) and Organization for Economic Co-operation and Development (OECD) have issued best practices for corporate governance, among which "disclosure," "transparency" and "shareholder value" are the core conceptions. These institutions refer to improved corporate governance standards as critical in helping emerging markets restore investor confidence and promote sustainable economic growth. With regard to Chinese domestic regulators, one example is that China Securities Regulatory Commission (CSRC) issued a guideline for the establishment of outside director system in listed companies in 2001.

2. Institutional Background

China is chosen as the context for this study as it provides an interesting experimental setting for examining the issues of institutions and corporate governance for the following reasons. Firstly, China is the largest emerging economy with the fastest economic growth rate in the world and the second largest economy in terms of GDP. Yet, it lacks a well-developed legal and institutional environment. For example, La Porta et al. (2004) ranked China among the worst countries with respect to political freedom as well as the security of property rights. The economic miracle of China without secure property rights and a well-established legal environment pose challenges to the traditional view that these are the two important preconditions for growth (Allen et al., 2005). My finding on the role of government helping hand sheds some light on this issue from microeconomic firm-level perspective.

Secondly, the Chinese corporate governance system has a number of unique characteristics. The average size of a board is small compared with that in the US firms.[5] The average board size in my sample is 5.99, which is much smaller when compared to 10.4 for the US firms, as mentioned in Coles et al. (2008). The phenomenon of smaller boards may generate some different mechanism or patterns consequently. Meanwhile, internal corporate governance is widely believed to be ineffective, and improving corporate governance should be a crucial objective of China's further economic reform. Liu and Lu (2007) empirically demonstrate that firms with lower corporate governance levels have higher levels of earnings management and suggest that such companies have high incentives to embezzle their earnings in response to a variety of regulatory loopholes. The most striking example is that the largest shareholder of Sanjiu Pharmacy extracted $301.9 million or 96% of this listed company's total equity in 2001 (Bai et al., 2004). Moreover, there is an inefficient managerial labor market, and therefore China lacks a market for corporate control as an external governance mechanism (Fan et al., 2002).

[5] One reason is that my sample contains both public and private firms, and the board is much smaller for private firms.

Thirdly, the Company Law of PRC (CCL) does not require a mandatory establishment of a board system for each firm, except for listed companies. To be more specific, the Chinese Company Law (CCL) has different requirements on the establishment of a board system and board structure of firms, depending on the nature of the firm. According to CCL, a limited liability company, with relatively fewer shareholders, or a relatively small limited liability company, may have an executive director and no board of directors (Article 51) and the board of directors, if established by a limited liability company, shall comprise 3 to 13 members (Article 45). On the other hand, the CCL requires that a joint stock limited company shall set up a board of directors, comprising 5 to 19 persons (Article 109). In the case of wholly state-owned enterprises (SOE), it states that they shall establish a board of directors, which shall comprise 3 to 9 persons (Article 68). Furthermore, China Securities Regulatory Commission (CSRC) issued a guideline for establishment of an outside director system in listed companies in 2001. The guideline required listed firms to have at least two outside directors before June 30, 2002.[6] Table 1 presents the requirements for board structure for different types of firms. This variation motivates my use of *Listed dummy* in substantiating the effects of board size and board structure on corporate performance in section 6.3.

[Table 1 about here]

For firms with a board system, the major decisions are made by the board and ratified by the shareholders. Formally stated in CCL, which was passed in 1993 and amended in December 1999, the board of directors are responsible for the shareholders' meetings and exercise the following authorities:[7] convening and carrying out the resolutions made at the shareholders' meetings; determining the operation plans and investment plans; working out the company's annual financial budget plans and final account plans; working out the company's plans on

[6] I thank a special editor for pointing out this issue.

[7] As a matter of fact, the Company Law of the People's Republic of China has been amended on October 27, 2005. The amended Company Law of the People's Republic of China went into effect as of January 1, 2006. As our survey was conducted in 2003, I apply the 1999 version which took effect in January 2000.

merger, division, change of the company type, dissolution; making decisions on hiring or dismissing the company's manager and his remuneration; etc.

Fourthly, it is observed that former government officials and experienced managers from other companies comprise a large part of the outside members of the boards in Chinese firms. For example, among the eleven outside board members in the Industrial and Commercial Bank of China (ICBC), the world largest bank by market capitalization (as of end of 2007), it is worthwhile to note that eight are former government officials.[8] Two experienced managers (both working in Goldman Sachs, with one being its former president) and one famous economist take up the remaining three positions. My empirical results on the influence of institutional environment on board structure shed light on this phenomenon.

Finally, the survey data on Chinese firms in the sample have information on institutional environment, board characteristics, CEO characteristics, and accounting information for both public and private firms, and this facilitates my analysis.

3. Conceptual Framework and Testable Hypotheses

Agency problems exist between a firm's shareholder and management (Jensen and Meckling, 1976). One of the roles of directors is to monitor top management, hire and fire CEOs, and assess a CEO's ability. Another role is to provide advice and counsel to the managers (Mace, 1971). In conjunction with the profit maximization motive in choosing the optimal board size and composition (Pferffer, 1972), a firm also balances the costs and benefits of the monitoring and advisory roles of the board when making such a choice. Transactions cost may drive the size and composition of a board out of equilibrium. A substantial literature illustrates that boards should consist of a balanced proportion of inside and outside directors, determined by trade-offs associated with the information that the directors bring to the board (e.g. Hermalin and

[8] Three were previously working in the Ministry of Finance of PRC, two were originally high officials of the State Administration of Taxation, and one was the former Financial Secretary of Hong Kong SAR.

Weisbach, 1988; McKinght and Weir, 2008; Lehn et al., 2009). Insiders are classified as directors who are current or former executives of the firm. Outsiders could be independent or gray.

Directors exercise the monitoring function by providing and designing incentives for managers to work harder. The major advantage of larger boards is the greater collective information that the board possesses (Lehn et al., 2009). Dalton et al. (1999) suggest that larger boards provide better advice to the management. In regard to board composition, many studies suggest that outsiders provide better monitoring and advice (Fama and Jensen, 1983; Hermalin and Weisbach, 1988).

On the other hand, the cost includes information acquisition cost, communication and coordination cost, the cost of free rider problems in addition to direct wages cost. Outside directors must acquire a certain amount of firm-specific information prior to offering feasible and expert advice and counseling. This cost will be larger if a firm hires more outside directors or if it requires more firm-specific information in its operations. Communication and coordination costs increase with board size (Jensen, 1993).

To summarize, outside directors monitor top management and provide advice to the CEO on business strategy (Coles et al., 2008), while inside directors formulate strategy and convey firm-specific information to the outside directors (Lipton and Lorsch, 1992; Jensen, 1993). A firm will hire additional outside directors if the marginal benefit from monitoring and advising exceeds the marginal cost resulting from information acquisition and communication.

3.1. *Property Rights and Board Structure*

Institutional environment affects the level of protection that shareholders have against expropriation and entrenchment by managers. Thus, the institutional environment affects a firm's needs for monitoring by its board of directors. Similarly, property rights protection and contract enforcement also affect advisory needs of the firm. For example, for firms operating in

the institutional environment where local governments are more likely to expropriate profits from the firms rather than extending a helping hand, CEOs are in more need of people with political expertise for advising on how to deal with corrupt government officials. Since outsiders provide better monitoring and advising, it is likely that firms facing weaker protection of property rights will hire more outside directors.

Indeed, a common feature of corporate boards in China is that former government officials and lawyers make up a large proportion of outside directors. Agarwal and Knoebel (2001) demonstrate that the proportion of outsiders with political expertise on boards is related to the firms' need for political advice. In the similar spirit, firms may appoint directors with backgrounds in law because they need more advice on legal and contract enforcement related issues. Therefore, I propose that the number and proportion of outside directors are negatively related to the strength of the institutional environment.

On the issue of board size, the predictions are not so clear. On the one hand, small boards are more efficient in monitoring management as larger boards are subject to coordination problems and director free-riding (Lipton and Lorsch, 1992; Lorsch and MacIver, 1989; Mizruchi, 1983; Zahra and Pearce, 1989; Jensen, 1993). On the other hand, larger boards possess greater collective information and provide better advice (Dalton et al., 1999; Lehn et al., 2009). Therefore, whether the effect of institutional environment on the size of a board is positive or negative is an empirical question.

Consistent with recent institution literature (Johnson et al., 2002; Acemoglu and Johnson, 2005; Cull and Xu, 2005), and as mentioned earlier, I decompose institutional environment into the following two groups of variables that measure firms' perception of: 1) the extent of helping and/or grabbing hand of the government; 2) legal environment and the liability of contract enforcement. For firms operating in a weaker helping hand environment, shareholder's rights are less protected and they have more needs to monitor the management. CEOs are also in more need of people with political expertise on how to deal with corrupt government officials. I proxy

a helping/ grabbing hand of government by measuring a senior manager's answers to the following question concerning "helping or hindering" (*Helping hand*) in the survey: among the government officials that your firm regularly interacts with, what is the share that is oriented toward helping rather than hindering firms? The value ranges from 0 to 1, with a mean of 36.3%, a median of 30%, and a standard deviation of 31%.

China's court system is known for its weak legal protection of property rights.[9] Some argue that courts in China are not accustomed to corporate governance rules and business matters.[10] Firms, perceiving weak legal protection of property rights or contracts enforcement, may seek former lawyers or legal practitioners for legal advice. In this study, I use a dummy variable related to the legal environment and contract enforcement. This variable indicates whether a firm usually signs written contracts with its clients (*Contract enforcement*) and reflects the mangers' belief in the legal system and contract enforcement. I hypothesize that a firm perceiving weaker protection of contract enforcement will need to pursue more advice from outsiders in case of a business dispute, compared to those who do not. For robustness, I also use the share of business disputes which were finally resolved through court action over the last three years (*Court*). The value of *Contract enforcement* ranges from 0 to 1, with a mean of 93.7% and a standard deviation of 24.3%.

3.2. *Firm Complexity and the Size and Composition of the Board*

Related studies suggest that complex firms have greater advisory needs (e.g. Klein, 1998). Larger firms are likely to have more external contracting relationships, and thus require larger boards (Pfeffer, 1972). Firms with a greater scope of operations will confront a more uncertain environment, thus their CEOs would rely more on outside directors for advice (Boone et al., 2007; Coles et al., 2008).

[9] China recently passed its Property Rights Law in March 2007, after considerable controversy during the past decade.

[10] See Clarke (1996) for more details.

Although advisory costs naturally increase with a firm's complexity, the benefits from effective advising should outweigh the cost on balance. Therefore, it is predicted that the board size increases in firm complexity and advisory benefits. I proxy firm complexity through three variables: *Scope of operation*, *firm size*, and the # *Business lines*. *Firm scope* is measured by a dummy that equals 1 when the firm sells products to more than two provinces in China. Ceteris paribus, the greater the number of business operations, the larger the competitive pressures faced by the firm, and higher the exposure to uncertain environments. These firms will have a larger board size. *Firm size* is proxied by the natural logarithm of total employees in a given year. # *Business lines* indicates the number of business lines the firm possesses, which mirrors the number of segments used in Coles et al. (2008).

3.3. *Firm-Specific Information/ Growth Opportunity and the Proportion of Insiders*

Activist investors, regulators and legislators have been pushing the U.S. firms towards a board structure consisting of more outside directors. Placing insiders on the board has its own merits, however. Raheja (2005) points out that inside directors benefit the company because they bring greater firm-specific information into the board's decision-making, and thus are more helpful to firms in selecting appropriate strategies and operation plans. Meanwhile, insiders and the CEO have to deliver such information to outside directors. The information communication cost is higher if the level of firm-specific information is more pronounced.

Smith and Watts (1992) and Gaver and Gaver (1993) suggest that the cost of monitoring managers increase with a firm's growth opportunity. Furthermore, firms with more growth opportunity have more information asymmetry. Therefore, firms with more firm-specific information and growth opportunity are postulated to have greater proportion of insiders as predicted due to larger information acquisition and communication cost. This is consistent with the spirit of the arguments by Coles et al. (2008) and Lehn et al. (2009).

Following the related literature, I proxy firm specificity and growth opportunity by the following two measures: *R&D intensity (R&D)* and *Reinvestment rate (reinvestment)*.[11] *R&D intensity* is calculated by R&D expenditure normalized by total asset of the previous year. *Reinvestment rate* is measured by total reinvestment volume divided by total sales of the previous year.

3.4. *CEO Characteristics and Board Structure*

In the theoretical model of Hermalin and Weisbach (1998), the board updates its beliefs about the CEO's ability based on the firm performance. According to the beliefs, the board chooses to dismiss or maintain the incumbent CEO. The board then chooses whether or not to obtain additional, costly signals about the incumbent or replaced CEO's ability, and this decision is a function of its independence from the CEO (Adams et al., 2010). If the CEO is retained, the independence of the board will depend on the outcome of the bargaining game between the board and the CEO. Recent literature finds evidence that successful CEOs are able to bargain for less independent boards (e.g. Baker and Gompers, 2003; Bonne et al., 2007).

Therefore, I hypothesize that a CEO's characteristics should have an effect on the firm's choice of board composition, in the sense that firms where the CEO has more power with longer tenure will have a smaller size with more insiders on the board. I measure CEO characteristics by *CEO ownership, CEO-Chairman dummy* and *CEO tenure*. *CEO ownership* is the percentage of stocks held by the CEO. *CEO-Chairman dummy* indicates whether the CEO is also the chairman of the board. *CEO tenure* is measured by the number of years the CEO had held the position as of the year of the turnover. The mean value is 4.6 years with a standard deviation of 3.5. In addition, in my data there is a unique question in the survey that intends to measure the autonomy of the CEO. It asks the interviewee to choose from one to eight in terms of the degree of the autonomy that the CEO possesses in three aspects: production decisions,

[11] This measure of R&D activity is used by many other researchers, for instance, Baysinger et al. (1991) and Hansen and Hill (1991).

investment decisions and labor flexibility. One indicates the strongest autonomy while eight refers to the least power. I add up the three scores, take inverse, and regard it as a new variable: *CEO autonomy power*.

3.5. *Board Structure and Corporate Performance*

Earlier studies document a negative association between board size and CEO turnover and thereby corporate performance (Yermack, 1996; Eisenberg, et al., 1998; Hermalin and Weisbach, 2003), which is consistent with the common view that communication costs and agency problems become more severe as a board grows larger. Similarly, Jensen (1993) points out that the directors are less likely to function effectively when a board has more than seven or eight directors. Moreover, there is near consensus in the popular press that effective boards will be comprised of greater proportions of outside directors (Lorsch and MacIver, 1989; Mizruchi, 1983; Zahra and Pearce, 1989). These non-management directors are believed to provide superior performance benefits to the firm as a corollary of their independence from firm management in monitoring managers.

Yet, two important issues complicate such studies dramatically, and lead to common drawbacks in these papers. The first is that the size and composition of a board are largely endogenously determined because the makeup and actions of the board are jointly endogenous (Adams et al, 2010). The second problem confronting such an approach is the heterogeneity of the firms in choosing different board structures. Different firm characteristics result in different optimization problems for the firms. As discussed earlier, more recently Boone et al. (2007), Coles et al. (2008), and Linck et al. (2008) treat board size and board structure as endogenous variables. The work that best controls for such issues is Coles et al. (2008), who interact firm characteristics (firm complexity dummy and R&D dummy) with the board characteristics to investigate the effects of board structure on firm values. The authors find that for "simple" firms,

Tobin's Q decreases in board size; while, for "complex" firms, it increases in board size.

Following and extending Coles et al. (2008), I interact measures of institutions, firm complexity and listed dummy with the size and the composition of the board to disentangle the effect of board structure on board efficiency and thereby firm performance. The major hypothesis is that when firms operate in a weak property rights environment, more outsiders improve corporate performance. I capture the performance of a firm by its return on asset (ROA). Goyal and Park (2002) document that bestowing CEO and board chairman duties on one individual affects a board's decision to dismiss an ineffective CEO; so I also control for CEO characteristics and include other control variables.

4. Data and Variables

4.1. *Sample and Firm Characteristics*

Most of the data used in the study come from the business environment and enterprise performance survey conducted jointly by the World Bank and the Enterprise Survey Organization of China in early 2003. In order to achieve a wide and balanced representation of enterprise, the sample includes 2,400 enterprises from 18 cities across five regions in China.[12] The survey includes both public and private firms, and firms with different ownership structures and sizes. The dataset includes a wealth of information about the board structure, CEO characteristics, as well as financial data. Perhaps more importantly, it covers information on the institutional environment and investment climate that I need for this study. I exclude those firms with negative assets and equities, and outliers where the number of board members is less than three or larger than nineteen in accordance with Company Law of PRC.[13] Of the 2,400 firms, about half of the firms do not have the board system. I rely on the sample of firms with board

[12] Five regions: (1) the Central Region: Changsha, Nanchang, Wuhan, and Zhengzhou; (2) the Northeast Region: Benxi, Changchun, Dalian, and Harbin; (3) the Northwest Region: Lanzhou and Xi'an; (4) the Southwest Region: Chongqing, Guiyang, Kunming, and Nanning; and (5) the Coastal Area: Hangzhou, Jiangmen, Shenzhen, and Wenzhou. Thirteen of the cities are provincial capitals, while the remaining five are major industrial cities.

[13] Detailed information about the regulation is illustrated in Section 1 and Table 1.

system in the main analysis and use the whole sample for robustness checks (section 5.3). Descriptive statistics are given in Table 2.

[Table 2 about here]

Board size is the total number of board members sitting on the board. A board member is classified as an insider, if the person is an employee, or a former employee of the company. The number of outsiders (*Outsiders*) is calculated as *Board size* minus *Insiders*. The proportion of outside directors (*Fraction of Outsiders*) is calculated as the number of outside directors divided by the total number of directors. The average board size in my sample is 5.95. Thus, as mentioned earlier, Chinese firms have much smaller boards than U.S. firms (the mean size in U.S. is 10.4 as in Coles et al. (2008)). One reason for this is that my sample contains both listed firms and private firms and I find that private firms have much smaller boards. I look at private firms as property rights might be a more important issue for private firms, since listed firms have more resources to rely on if their property rights are not well protected. The average proportion of outsiders is 0.31. This is much smaller than the findings in Bai et al. (2001) of 0.71. The inclusion of private firms in my sample also contributes to this phenomenon. Table 3 presents summary statistics of board characteristics across the 18 cities. I observe that the size of the board ranges from 5.14 in Wenzhou to 6.55 in Changchun, and the proportion of insiders ranges from 58.1% in Dalian to 87.8% in Wenzhou. The variations are substantially large.

[Table 3 about here]

I capture the performance of a firm by its return on asset (*ROA*), calculated by net income standardized by the firm's total asset in the previous year, to control for size differences.[14] The mean *ROA* is 0.039 with a standard deviation of 0.16.

[14] The measure is commonly used in the literature to capture a firm's performance (Denis and Denis, 1995; Damodaran, 2001; Anderson and Reeb, 2003).

4.2. *Other Firm Control Variables*

In addition to the variables discussed above, my analysis also includes several firm-level controls, such as ownership structure, access to finance, firm age, corporate performance in the previous year, and market competition. Market structure and access to finance are important factors in affecting a firm's needs for advice from directors. I include two measures for ownership structure: *Private ownership* and *Foreign ownership*. *Private ownership* is the percentage of total shares held by private investors (vs. government ownership). *Foreign ownership* is the percentage of total shares held by foreign investors. *Access to Finance* is a dummy variable that equals 1 if the firm has access to bank loans and 0 otherwise. Firm age is the log of the number of years since the firm's establishment (*Firm Age*). It is believed that as firms age, they become more complex and more mature in management. Therefore, firm age may also be an appropriate control variable in the analysis. I include ROA_{t-1} as a measure of the corporate performance in the previous year, calculated as the ratio of net income to book value of assets in the previous year. A widely used measure of market competition is the number of competitors (Nickell, 1996). In the survey, the relevant question concerns the number of domestic competitors faced by the firm in its main business line or service (*Competition*). The responses to the question are categorical (1 – 1~3 competitors, 2 – 4~6 competitors, 3 – 7~15 competitors, 4 – 16~100 competitors, 5 – more than 100 competitors). It is believed that whether or not a firm has access to bank finance should positively affect its advisory needs from outside directors. Finally, industry dummy variables are included in the analysis to control for possible heterogeneity arising from industry characteristics. Table 4 reports the summary statistics for the control variables averaged at the city level.

[Table 4 about here]

4.3. *City-Level Control Variables*

My analysis also includes several city-level control variables to control for the potential differences of economic development across regions. I include the natural logarithm of city GDP (*Log(GDP)*), the natural logarithm of GDP per capita (*Log(GDP per capita)*), and the number of colleges in the city (*#Colleges*). Both the *Log (GDP)* and *Log (GDP per capita)* variables indicate the size of the market facing the firms in the city concerned while the local # *Colleges* variable proxies the local science and technology infrastructure. All this information is collected from the China City Statistical Yearbook. In alternative model specifications, I include city fixed effects instead of city-level control variables to control for additional city-level omitted variables. I also try adding the interaction terms between industry and city dummies to address the concern that the estimation results could be biased due to the variations in industrial structure across cities.

5. Empirical Results: Determinants of Board Structure

5.1. *Determinants of the Size and Composition of the Board*

I construct the following baseline econometric models:

$$\begin{aligned} Log(Board\ Size)_{f,i,c} = {} & \alpha + \beta_1 Institutions_{f,i,c} + \beta_2 Firm\ Complexity_{f,i,c} + \beta_3 CEO\ Characteristics_{f,i,c} \\ & + \beta_4 Growth\ Opportunity_{f,i,c} + \beta_5 Firm\ controls_{f,i,c} + \beta_6 City\ controls_c + \varepsilon_{f,i,c} \end{aligned} \quad (1)$$

$$\begin{aligned} Log(Outsiders)_{f,i,c} = {} & \alpha + \beta_1 Institutions_{f,i,c} + \beta_2 Firm\ Complexity_{f,i,c} + \beta_3 CEO\ Characteristics_{f,i,c} \\ & + \beta_4 Growth\ Opportunity_{f,i,c} + \beta_5 Firm\ controls_{f,i,c} + \beta_6 City\ controls_c + \varepsilon_{f,i,c} \end{aligned} \quad (2)$$

$$\begin{aligned} Fraction\ of\ Ins_{f,i,c} = {} & \alpha + \beta_1 Ins_{f,i,c} + \beta_2 Institutions_{f,i,c} + \beta_3 CEO\ Characteristics_{f,i,c} \\ & + \beta_4 Firm\ C_{f,i,c} + \beta_5 Firm\ controls_{f,i,c} + \beta_6 City\ controls_c + \varepsilon_{f,i,c} \end{aligned} \quad (3)$$

where *f, i, c* indicate firm, industry and city respectively; $\varepsilon_{f,i,c}$ is the error term. The variable *Institutions* includes *Contract enforcement* and *Helping hand*. *Firm complexity* includes *Firm size*, *Scope of operation*, # *Business lines*, and *Firm complexity (dummy)*. I compute a factor score for firm complexity using firm size, scope of operation, and number of business lines. *Firm complexity (dummy)* equals one if this factor score is greater than the median value and zero otherwise. *CEO Characteristics* refers to various measures of CEO characteristics, including *CEO ownership, CEO tenure (years), CEO-Chairman (dummy), and CEO Power*. Growth Opportunity includes measures of firm-specific information and growth opportunity: *Reinvestment rate*, and *R&D intensity*. *Firm controls* include *Firm age, Private ownership, Foreign ownership,* ROA_{t-1}*, Competition, Access to Finance, and Industry Dummies*. *City-level controls* include *Log (GDP), Log (GDP per capita), # Colleges, or City dummies and Industry-city dummies*. I also include a listed dummy variable in all of the regressions, since public status is one important determinant of board size and structure as shown in Section 2.[15] Detailed definitions of the variables can be found in Sections 3, 4 and Table 2. Summary statistics are reported in Tables 2, 3 and 4.

The regressions are based on ordinary least squares (OLS). All the independent variables are winsorized at the 1st and 99th percentile values to alleviate the problem of extreme outliers. Throughout, heteroskedasticity-consistent standard errors clustered at the city-industry level are reported in brackets below the coefficients.[16] Although I have checked that multi-collinearity is not a major problem by running pair-wise correlations, since most of the correlation coefficients are under 0.1 or 0.2 as shown in correlation matrix in Table 5, I include variables into the equation group by group.

[Table 5 about here]

[15] I thank one special editor for this suggestion. I also tried dropping the listed firms from the sample, and all of the empirical results are maintained. The results are further discussed in Section 5.3.

[16] I also try by clustering the standard errors at the city level, and find all of my results are robust to this clustering method. The results are not tabulated for brevity and are available upon request.

5.1.1. *Determinants of Board Size*

Table 6 reports the regressions of *Log (Board size)* on measures of institutions, firm complexity, CEO characteristics, as well as the control variables. Models 1 and 2 are the basic regressions with only measures of institutions and control variables. Model 1 includes city-level controls while model 2 includes city dummies. In both of the models, I find no significant relationship between both measures of property rights and the size of board. The coefficients of *Contract enforcement* and *Helping hand* are not significant at the 10% level. This finding is not surprising. As I mentioned earlier in Section 3.1, that the prediction of the relationship between board size and institutions is not clear. I hypothesize that firms located in regions with weak protection of property rights need more advising and monitoring from the board. Nevertheless, on the one hand, larger boards are better at processing collective information and thereby better at advising. On the other hand, smaller boards are better at monitoring.

[Table 6 about here]

Since the inclusion of city dummies could control for unobservable city-level variables, I regard Model 2 as my benchmark regression, and include city dummies instead of city-level control variables in Models 3 to 7. In Model 8, I add industry-city dummies to control for the additional concern that the results could be biased due to the variations in industrial structure across cities.[17] Model 3 tests the relationship between firm complexity and board size. My prediction that board size and firm complexity are positively correlated is strongly confirmed. The coefficient estimate of *Firm Size* is positive and highly significant at the 1% level. The significance is maintained after controlling for CEO characteristics in Model 4. The directions for the other two measures are positive, although not significant at conventional levels. The correlation among the three measures of firm complexity might reduce the significance, and I will use one single item based on factor analysis to release such a concern. Model 5 uses the

[17] I thank the referee for this suggestion.

dummy variable for firm complexity instead of the three separate measures and also controls for CEO power.[18] *Firm complexity (dummy)* equals one if this factor score based on firms size, scope of operation, and number of business lines is greater than the median value, and zero otherwise. I find that the coefficient of *Firm complexity (dummy)* is significantly positive at the 1% level. In terms of magnitude, I find that the results are also of economic significance. Specifically, the board size is 12.01% larger for complex firms compared to simple firms, holding other variables constant.[19] Model 6 controls for growth opportunity, and Model 7 further controls for measures of institutions. Model 8 controls for industry-city dummies. In all the three models, the significance of *Firm complexity* remains at the 1% level. These results are consistent with my hypothesis that firms that have greater advisory needs require larger boards, which also confirms the findings of Coles et al. (2008) and Lehn et al. (2009).

The results on some other variables are also interesting. Firstly, I find *CEO-Chairman (dummy)* reduces the size of the board, significantly at the 1% level. To be more specific, a firm with a CEO who is also the chairman of the board reduces the number of directors by about 7.4%. Secondly, CEO ownership is negatively and significantly correlated with the size of the board. These findings are consistent with the conjecture regarding the private benefit and bargaining power of the CEO. Thirdly, I find firms with larger proportion of foreign and private ownership have smaller boards. Finally, listed dummy is positive and significant across all the models, indicating that listed firms indeed have larger board size, which is consistent with the regulations as discussed in Section 2.

5.1.2. *Determinants of the Number of Outsiders*

The hypothesis is that firms with weaker protection of property rights need more monitoring

[18] Model 5 removes the measures of CEO ownership and CEO tenure, as I find the correlation between CEO autonomy power and the two variables to be substantially high.

[19] Note that the dependent variable is in the log form, and therefore, the interpretation of the results is in percentage change of the dependent variable for the change in independent variable.

and advising, which results in more outside directors and a larger proportion of outsiders. Moreover, firms with a higher level of complexity needs more advising, and thereby have a larger number of outsiders.

Table 7 reports the results. As in Section 5.1.1, I include the variables step by step. In the basic regressions depicted in Models 1 and 2, I find that *Helping hand* is negatively and significantly related to the number of outsiders at the 1% significance level, which is consistent with my prediction. Specifically, a one standard deviation decrease in government helping (grabbing) hand results in 7.38% (=0.2381*0.31) increase (decrease) in the number of outsiders. Therefore it is not only statistically but also economically significant. The significance and magnitude are similar for city-level controls and city dummies as indicated in Models 1 and 2. The significance remains after controlling for firm complexity, CEO power and growth opportunity, as well as other control variables (Model 7), and reduces to 5% level after also controlling for industry-city dummies (Model 8).

[Table 7 about here]

The coefficient of the other measure of property rights *Contract enforcement*, however, is not significant at the 10% level. This interesting finding might suggest that government helping hand, rather than contract enforcement, plays an important role in determining the number of outside directors on the board. This is consistent with the finding of Acemoglu and Johnson (2005) that the risk of expropriation is the more severe impediment to economic development. Another possible explanation is that in the face of weak contract enforcement, firms may not benefit by hiring lawyers or legal practitioners as outside directors. In terms of weak government helping hand, however, firms may gain much more through political connections by placing former government officials on the board. This is consistent with Li et al. (2008) who find that political connections have a positive effect on firm performance in China, and is also consistent with the phenomenon that the proportion of former government officials as outside directors is much

higher than the proportion of former legal practitioners. Moreover, *Contract enforcement* might be one part of helping hand. For countries like China, which have poor legal protection and contract enforcement, government helping hand can act as a substitute. In addition, the low variation in *Contract enforcement* across cities as indicated in Table 4 might also be a source of the insignificance of *Contract enforcement* in determining board size and board structure.

Models 3 to 6 test the relationship between the number of outsiders and firm complexity, CEO power, as well as growth opportunity. I find strong evidence consistent with my hypotheses. Specifically, I find a positive and significant association between measures of firm complexity and the number outsiders, which confirms the conjecture that complex firms have more advising needs. Measures of CEO power are negatively and significantly associated with the number of outsiders, consistent with conventional wisdom that the board has fewer outsiders when the CEO has more power (Baker and Gompers, 2003). With regard to growth opportunity measures, the variable *Reinvestment rate* is negatively related to the number of outside directors, and is significant at the 5% level (Model 6). This supports the view that for firms with more firm-specific information and growth opportunity, the information acquisition and communication cost associated with a larger number of outsiders is higher, and therefore, it is more optimal to have more insiders. The significance is reduced to 10% level when including more control variables, as it is possible that reinvestment rate might correlate with institutions and city unobservable variables. Across all the models, listed dummy is positive and significant at 1% level, consistent with that CSRC requires listed firms to have at least two outsiders does not have explicit requirement for private firms.

5.1.3. *Determinants of the Proportion of Insiders*

The results are shown in Table 8. I find a positive and significant relationship between *Helping hand* and the proportion of insiders at the 1% significance level, which is consistent with my

hypothesis. Since the proportion of insiders equals to one minus the proportion of outsiders, the results indicate a negative relationship between *Helping hand* and the proportion of outsiders. The significance is maintained after controlling for measures of growth opportunity, CEO power, and firm complexity as well as the other variables in Model 7, and reduces to 5% level after controlling for industry-city fixed effects in Model 8. Economically, one standard deviation decrease (increase) in helping hand decreases (increases) the fraction of insiders by 3.27 percentage point (=0.1055*0.31), holding others constant.

[Table 8 about here]

My hypothesis regarding firm-specific information and growth opportunity is supported. To be more specific, I find a positive and significant association between *Reinvestment rate* and the proportion of inside directors across all the models. In terms of magnitude, a one standard deviation increase in reinvestment rate results in a 2.89 percentage point (=0.0871*0.332) increase in the proportion of insiders.

Moreover, I find strong support for the hypothesis of CEO power. Throughout Models 4 to 8, my measures of CEO power have positive and consistently significant effects on the proportion of inside directors. For example, CEO-Chairman dummy is significant and positive at the 1% level in all the five models. Firms where the CEO is also the chairman of the board have about 15 percentage point higher proportion of insiders. The findings are consistent with my prediction that firms where CEOs have more power are inclined to place more insiders on the board, and this supports the private benefit of CEO hypothesis. Furthermore, I find that firms with foreign investment have larger proportion of outside directors than domestic firms, which is supported by all the models and is significant at the 5% level. This is consistent with the finding in Huang and Zhu (2014) that the involvement of foreign institutional investors improves corporate governance in China. In addition, listed dummy is negative and significant in all the models, again consistent with the CSRC regulation as discussed in Section 2.

To sum up, the regression results confirm my expectations regarding the effects of institutions on board size and structure. I find that government help is negatively correlated with both the number and proportion of outsiders on the board after controlling for the effects of firm complexity, firms-specific information, CEO characteristics, ownership, and other variables. Complex firms have larger boards and more outsiders. Firms with more firm-specific information and growth opportunity have a larger proportion of insiders and smaller number of outside directors. Listed firms have larger board size, the number of outsiders, and higher fraction of outsiders. Moreover, firms whose CEOs are more powerful have smaller boards with a larger proportion of insiders due to the private benefit of CEOs.

5.2. *Endogeneity Problem and Instrumental Variable (IV) Estimation*

The previous subsection has obtained encouraging findings about the negative relationship between government helping hand and the number and proportion of outsiders. The findings, however, are based on correlations, and no causal links have been established. The estimation could be biased if institutions and board structure are endogenous. One possibility is that firms with more outside directors (mostly former government officials and lawyers) may perceive that the institutional environment that they are confronting is better. This feedback effect might bias the results downward. Measurement error and omitted variable problems might further exacerbate the bias. It is also possible that institutions and board structure are determined simultaneously by other factors.

In order to remedy the potential endogeneity and/or measurement problem, I instrument the measures of institutions. An instrumental variable must: 1) correlate with the independent variable being instrumented: *Contract enforcement* and *Helping hand*; and 2) have no independent effect on the residual of the dependent variable, except through its effect on the instrumented

variables (Angrist et al., 1996; Murray, 2006; Angrist and Pischke, 2009).

According to this criterion, my identification strategy is to use three sets of instrumental variables. The first set follows the spirit of theoretical and empirical literature on law, institutions and growth, which shows that historically determined differences in legal and colonial traditions help explain international differences in institutional environment today (La Porta et al, 2003). Moreover, legal origin and colonial history can be thought of as exogenous because it was imposed by a colonial power in many emerging countries (La Porta et al., 1999; Acemoglu and Johnson, 2005; Acemoglu et al., 2001 and 2002). Specifically, I use two variables: *British administration* and *City population in 1918-1919*. *British administration* is a dummy variable indicating whether the respective region was administered by Great Britain in the late Qing Dynasty (1884-1911). The instrument was used in Lu and Tao (2009).[20] In my sample, eight cities were under the sovereign control of Great Britain.[21] In those areas, the common law system, which is believed to lead to more effective contract enforcement and protection of property rights, was applied to settle lawsuits. Thus, we expect these eight cities to have better protection of property rights. Indeed, Changsha has the largest value of *Contract enforcement*, and Hangzhou has the second largest value of *Helping hand*, as shown in Table 4. *City population in 1918-1919* refers to a log of the number of city population in 1918-1919. As argued in Lu et al. (2010), the period of 1918-1919 in China was characterized by frequent regional wars between a number of "warlords", and the local governments had the right to set the tax levels. Thus, the larger population could reflect better protection of property rights.

The second set of instruments follows the idea of Laeven and Levine (2009), and Fisman and Svensson (2007). Fisman and Svensson (2007) use industry-location averages as instruments in

[20] During late Qing Dynasty (1984-1911), China's territory was partitioned among several foreign powers after it was defeated in a series of wars. The foreign powers established their own sovereign authorities and imposed their own civil, legal, and military administration. Specifically at the end of the 19th century, Great Britain governed regions along the Yangtze River (Guizhou, Sichuan, Hubei, Hunan, Jiangxi, Anhui, Jiangxu, Henan, and Zhejiang), France governed Yunan, Hainan, Guangxi, and the majority of Guangdong, Germany obtained the control of Shandong, Japan governed Fujian, and Russia controlled Xinjiang, Mongolia, and the three north-eastern provinces (Qian, 1948).

[21] The cities are Changsha, Nanchang, Wuhan, Zhengzhou, Chongqing, Guiyang, Hangzhou, and Wenzhou.

order to overcome an endogeneity problem that is similar to the one that I have encountered. Their argument is that if the endogeneity problem is specific to firms rather than industries or locations, then netting out this firm-specific component will provide a measure that solely depends on the characteristics pertaining to industries and/ or locations (Fisman and Svensson 2007). This strategy is widely used in the recent literature, such as Laeven and Levine (2009), Lin, Lin and Song (2010), Lin, Ma, Malatesta and Xuan (2011a and 2011b). Following in this vein, I use industry-location median of the potentially endogenous variables (*Helping hand* and *Contract enforcement*) as the instruments.[22]

Li et al. (2008) argue that in China the Communist Party membership helps firms to get access to finance and provides them with more confidence in the protection of property rights and contract enforcement. I therefore use the Communist Party leadership of the CEO: *Party secretary dummy* and *Party deputy secretary dummy* as additional instrumental variables. The information is contained in the survey data, and the two variables are also used as instruments in Lin et al. (2010).

In order to statistically verify the validity of my instruments, I rely on three tests. Firstly, I use the Hansen J test for the overidentifying restrictions. I refer to this test as "Overidentifying test" and report the P-value of the test. As shown in Table 9, I cannot reject the null hypotheses that the instruments are valid for all the nine models, suggesting overidentification is not a problem in these models. Secondly, I employ an F-test of the excluded exogenous variables in the first-stage regressions. I report the P-value of the F-test in Table 9. The null hypothesis is rejected at the 1% level in all model specifications, which implies that my instruments can explain the differences in instrumented variables. Finally, I exploit the recent development in the imperfect instrumental variable literature and adopt the Fractionally Resampled Anderson-Rubin (FAR) test developed by Berkowitz et al. (2012) to draw valid inferences in a setup that allows for

[22] This way, because we have already controlled for sector dummies and city information (or city dummies), it is unlikely that our institutional indicators are correlated with firm-specific determinants of board size and structure.

instruments that do not perfectly satisfy the orthogonality condition.[23] The results are reported in the last third row of Table 9. I find that all of my instrumental variable estimations are robust to the FAR test at 10% significance level, which alleviates the concern that the instruments might not satisfy the strict exogeneity condition.

[Table 9 about here]

Note there is a concern that when including city fixed effects, the first set of instrumental variables (British administration and City population in 1918-1919) are at the city level and could not be used. Therefore, I firstly report the IV regressions with city-level controls and a full set of instrumental variables, and then report IV results with city dummies and only the second and third sets of instrumental variables. The standard two step least squares (2SLS) are used and the results are reported in Table 9. Specifically, in Models 1, 2, 4, 5, 7, and 8, I include city-level controls and a full set of instruments. In Models 3, 6 and 9, I include city dummies instead of city-control variables, and only use the second and third groups of instruments (industry-location median of the potentially endogenous variables, and the Communist Party leadership of the CEO).

As shown in Table 9, my results are robust to instrumental variable analysis. The coefficients of *Helping hand* are negative and statistically significant in the regressions of *Log (outsiders)* and the *Fraction of outsiders*. The significance is maintained after controlling for the effects of firm complexity, CEO characteristics, Growth opportunity as well as other control variables and city dummies. Firms that express less confidence in the government's helping hand are more likely to have a larger number of outsiders and a larger proportion of outside directors. The reduction in the level of significance of these predicted values from the 1% level to the 5% level (Models 5 and 7) compared to OLS estimates is attributable to the endogeneity problem. That these variables remain significant after correcting for this problem confirms the robustness of my

[23] One issue worth noting is that it is really difficult to find strictly exogenous variables in the setting of cross-sectional data. I thank the referee for pointing out this issue and suggesting the imperfect IV literature.

hypothesis regarding the causal relationship between institutions and board structure. More interestingly perhaps, I find the coefficients to be larger when compared to OLS results, which suggests that the endogeneity problem, together with measurement error, tend to attenuate the effects of *Helping hand* on *Log (outsiders)* and the *Fraction of outsiders*. To get a sense of the quantitative effect of helping hand on the proportion of outsiders, one standard deviation decrease in government helping (grabbing) hand brings about a 16.9 percentage point (=0.5459*0.31) increase (decrease) in the proportion of outsiders (Model 7). The effects are substantially large given the mean value of the proportion of outsiders is 30.7%.

Also consistent with previous findings, complex firms have larger boards. Firms with more firm-specific information and more growth opportunity have fewer outsiders. Firms whose CEOs have more power are inclined to have a smaller number and proportion of outside directors. Furthermore, firms with more foreign investment tend to have smaller boards with a larger proportion of outsiders, and firms with more private ownership are also likely to have smaller boards. In addition, listed firms have larger board size, larger number of outsiders, and higher fraction of outsiders.

5.3. *Further Robustness Checks*

The major variables measuring institutions come from the managers' responses to the questions in the World Bank survey. In order to better understand whether the responses reflect the actual institutional environment in which firms operate, I run a one-way ANOVA test to see whether the variables are clustered by cities. The results are shown in Appendix T1. From the table, I find that all the F-statistics are significant at the 1% level, which provides evidence that the variables are indeed clustered across the 18 cities in the sample.

One concern is that the previous findings could be driven by the inclusion of state-owned firms. This might happen because SOEs could enjoy better property rights protection but there

is no requirement of board or outsiders in the board. To show the robustness, I try two ways: 1) adding SOE dummy; 2) only focusing on the non-SOE firms.[24] In the untabulated results, I firstly include SEO dummy and find that the previous findings are robust (*Log (board size, Log (outsiders)*, and *Fraction of outsiders*). I then try dropping 64 SOE firms in the sample and once more the results are maintained.

Another concern is that the findings could be driven by the inclusion of listed firms, due to the requirement by Chinese Corporate Law (CCL) and China Securities Regulatory Commission (CSRC).[25] There might be heterogeneous effects across listed and non-listed firms. In all of the previous results, I have included a listed dummy to capture such effects. And indeed Listed (dummy) is positively and significantly correlated with *Log (board size), Log (outsiders)*, and *Fraction of outsiders*. I also reestimate the main regressions with dropping the 44 listed firms in the sample. I focus on the non-listed firms for two major reasons. The one reason is that property rights might be a more important issue for private firms, since listed firms have more channels and resources to rely on if their property rights are not well protected. The other reason is that there are only 44 listed firms in the sample, and it is difficult to draw any statistical inferences using regression methods. Focusing merely on the non-listed firms, I find all of the results are consistent and robust.[26]

As discussed in Section 2, Chinese Corporate Law (CCL) does not mandatorily require every private or wholly SOE firms to establish a board system. In my sample, about half of the firms do not have the board system. In the previous analysis, I merely look at the firms whose board system has been already established. For robustness, I also utilize the full sample and launch the Heckman selection model and Tobit regressions in view of the obvious left censoring problem. The results are qualitatively similar and I do not report them in the paper for brevity.

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[24] I am grateful for this suggestion provided by the referee.

[25] To be more specific, as discussed in Section 2, for the year of our data - 2002, CSRC requires each listed firm to establish board system, and the size is required to be between five and nineteen. For private firms, it is not required to establish a board system according to CCL, and the size is required to be between three and nine if a board system is established. In 2001, CSRC required each listed firm to have at least two outsiders before June 30, 2002.

[26] The results are not tabulated and are available upon request.

In addition, previously I did not find a significant relationship between *Contract enforcement* and board structure. I now try an alternative measure of the protection of contract, *Court*, measured by the share of business disputes which were finally resolved through court action over the last three years. The variable reflects the firms' confidence in the legal system. I run similar regressions as previously described and do not find significant results either.

6. Board Structure and Corporate Performance

In this Section, I estimate the effect of board size and board structure on corporate performance for various types of firms, following and extending the idea of Coles et al. (2008). I capture the performance of a firm by its return on asset (ROA).

6.1. *Effect of Board Size on Corporate Performance: Complex versus Simple Firms*

I construct the following model specification to study the effect of board size on ROA.

$$ROA = \alpha + \beta_1 Log(Board\ size) + \beta_2 Log(Board\ size) \times Firm\ complexity\ (dummy) + \beta_3 Firm\ controls + \beta_4 City\ controls + \varepsilon \quad (4)$$

β_1, the coefficient of *Log (Board size)* in the above model captures the effect of board size on *ROA* for simple firms. β_2, the coefficient of $Log(Board\ size) \times Firm\ complexity\ (dummy)$, indicates the incremental effect of board size on *ROA* for complex firms.

The first column of Table 10 reports the results for the above specification. I find that β_2 is not statistically significant at the 10% level.

[Table 10 about here]

6.2. *Effect of Number of Outsiders on Corporate Performance: Helping Hand versus Grabbing Hand*

I argued earlier that firms facing a weak helping hand stand to benefit from having more outside directors on the board because shareholders need more monitoring and CEOs have a greater need for advice from directors with political expertise. So we expect firms in the grabbing hand environment with more outside directors to have better corporate performance. I test this empirically using the following specification:

$$ROA = \alpha + \beta_1 Log(Outsiders) + \beta_2 Log(Outsiders) \times Weak\ helping\ hand\ (dummy) + \beta_3 Firm\ controls + \beta_4 City\ controls + \varepsilon \quad (5)$$

Weak helping hand (dummy) is a dummy variable with one indicating the value of helping hand that is less than the median value of the sample, and zero otherwise.

The second column in Table 10 presents the estimation results. I find that β_2 is positive and statistically significant at the 5% level, indicating that firms facing grabbing hand from the government with larger number of outside directors indeed have better corporate performance.

6.3. *Effect of Board Size, Number of Outsiders on Corporate Performance: Listed versus Private Firms*

As I discuss previously, listed firms have larger boards with more outsiders, mandated by the CCL and CSRC. I employ such a variation to study the effect of board size, number of outside directors on corporate performance. The specifications are similar to Section 6.1 and 6.2, and I replace *Firm complexity (dummy)* and *Weak helping hand (dummy)* by a *Listed (dummy)* in equations (4) and (5).

The regression results are reported in the third and fourth columns in Table 10. Throughout the specifications, I find evidence that listed firms with larger boards and more outsiders

perform better as measured by ROA.

Summing up, I estimate the effects of board size and board structure on corporate performance for various types of firms, by interacting board structure with types of firms. I find evidence that when firms operate in a weak property rights environment more outsiders improve performance. Listed firms with larger boards and more outsider directors also have better performance.

7. Concluding Remarks

Using data on China, I investigate how property rights affect board structure, and how board structures affect corporate performance. The World Bank survey data on 2,400 firms in 18 Chinese cities in 2003 is unique and provides detailed information on board structure, managers' perceived degree of property rights protection, the service quality of local governments, CEO characteristics, as well as firm ownership and financial data. Overall, I find that weak helping hand from the government exerts positive effects on both the number and the proportion of outsiders on the board, after controlling for the effects of firm complexity, firms-specific information/ growth opportunity, CEO characteristics, ownership, and other variables. The result is supported by the estimation both with and without the use of instrumental variables. Furthermore, I find that weak property rights protection firms with more outsiders and listed firms with larger boards and more outsider directors have better corporate performance.

This study is among the first attempts to empirically examine the effects of property rights protection on corporate board structures. It contributes to the recent emerging literature that emphasizes the importance of economic institutions. It also adds to the vast literature on corporate board, which has focused mostly on publicly traded firms. I also look at private firms as property rights might be a more important issue for private firms, since listed firms have more

channels and resources to rely on if their property rights are not well protected. An important policy implication is that institutions not only matter to economic growth, but also to the internal corporate governance. Across all the models, I do not find any significant effects of contract enforcement on board size and structure, indicating that for countries like China with poor legal protection and contract enforcement, government helping hand can act as a substitute, and firms may gain much more benefits through political connections by placing former government officials on the board.

Moreover, my estimation results show strong relationships between board structure and firm characteristics, which confirms the suggestion in Coles et al. (2008) that any regulatory framework that imposes uniform requirements on board structure could be ill-conceived. In addition, the finding that in a weak property rights environment, firms with more outsiders have better corporate performance, will provide insights for Chinese firms in choosing appropriate board structures in addition to taking into account their own heterogeneity. This will also shed some light on firms in other developing countries with poor institutions and corporate governance that are similar to China.

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Table 1
Different Requirements on the Establishment of Board System and Board Structure by Chinese Corporate Law (CCL) and China Securities Regulatory Commission (CSRC)

The requirements are based on the regulations in year 2002.

Firm nature	Board	Required board size range (if there is a board)	Outsiders
Listed firm	Required by CCL	5-19	At least 2, as required by CSRC
Non-listed firm	Not required	3-13	Not required
Wholly SOE	Not required	3-9	Not required

Table 2
Summary statistics

The summary statistics are based on the observations in year 2002. Board size is the number of board members. Insiders is the number of employee directors. Outsiders is the board size after subtracting the number of insiders. Insider fraction is the ratio of number of insiders to board size. Contract is a dummy variable which equals 1 if the firm has signed at least one formal contract with a client. Helping Hand measures the helping hand from government, which is based on the firm's response to the question "Among government officials that your firm regularly interacts with, what share of their contact is oriented toward helping rather than hindering firms?" Firm size is the natural logarithm of number of employees. Scope of operation is measured by a dummy that equals 1 when the firm sells products to more than two provinces in China. # Business lines measures the number of business lines the firm possesses. CEO ownership indicates the percentage of stock CEO holds of the company. CEO tenure is measured by the number of years the CEO had held the position as of the year of the turnover. CEO-Chairman dummy indicates CEO is also the chairman of the board. R&D intensity is the ratio of research and development (R&D) expenditure to book value of assets. Private ownership is the percentage of total shares held by private investors. Foreign ownership is the percentage of total shares held by foreign investors. ROA_{t-1} is the ratio of net income to book value of assets in the previous year. Firm age is the number of years since establishment. Access to Finance is a dummy variable, which equals one if the firm has at least one bank loan and zero otherwise. # Colleges measures the number of colleges in the city where the firm is located. All variables are winsorized at the 1^{st} and 99^{th} percentile values.

	Obs	Mean	SD	Min	Median	Max
Board Characteristic						
Board size	1148	5.945	2.429	3	5	19
Insiders	1148	3.958	2.481	0	4	19
Outsiders	1148	1.987	2.461	0	1	14
Fraction of insiders	1148	0.693	0.330	0	0.8	1
Property Rights						
Contract enforcement	1141	0.937	0.243	0	1	1
Helping hand	1080	0.363	0.310	0	0.3	1
Firm Complexity						
Firm size	1146	5.127	1.485	0	5.011	10.154
Scope of operation	1130	0.648	0.478	0	1	1
# Business lines	1129	1.314	0.749	1	1.072	6.410
CEO Characteristics						
CEO ownership	1111	0.123	0.215	0	0	1
CEO tenure (years)	1015	4.634	3.459	1	4	30
CEO-Chairman (dummy)	1142	0.471	0.499	0	0	1
CEO autonomy power	1148	0.185	0.107	0.042	0.143	0.333
Growth Opportunity						
Reinvestment rate	1035	0.192	0.332	0	0	1
R&D intensity	1126	0.010	0.026	0	0	0.156
Other Firm-Level Controls						
Private ownership	1148	0.756	0.374	0	1	1
Foreign ownership	1148	0.139	0.291	0	0	1
Listed (dummy)	1148	0.045	0.208	0	0	1
Wholly SOE (dummy)	1148	0.065	0.247	0	0	1
Firm age	1148	11.375	11.879	2	7	52
ROA_{t-1}	1113	0.039	0.156	-0.570	0.012	0.736

Acess to finance	1148	0.303	0.460	0	0	1
City-Level Controls						
Log (GDP)	1148	6.529	0.661	4.970	6.574	7.722
Log (GDP per capita)	1148	0.910	0.620	0.049	0.831	2.784
# Colleges	1148	23.760	13.248	1	26	48

Table 3
Board characteristics across cities

The summary statistics are based on the observations in year 2002. Board size is the number of board members. Insiders is the number of employee directors. Outsiders is the board size after subtracting the number of insiders. Insider fraction is the ratio of number of insiders to board size.

City	Board size	Insiders	Outsiders	Fraction of insiders
Benxi	6.067	5.100	0.967	0.848
Changchun	6.554	4.609	1.946	0.729
Changsha	6.145	4.177	1.968	0.719
Chongqing	6.260	3.875	2.385	0.652
Dalian	5.462	2.954	2.508	0.581
Guiyang	5.944	3.833	2.111	0.692
Haerbin	5.362	3.879	1.483	0.737
Hangzhou	6.388	3.838	2.550	0.601
Jiangmen	4.804	3.543	1.261	0.762
Kunming	6.172	4.397	1.776	0.716
Lanzhou	5.154	3.949	1.205	0.763
Nanchang	6.362	4.551	1.812	0.736
Nanning	5.404	4.018	1.386	0.774
Shenzhen	6.177	2.747	3.430	0.480
Wenzhou	5.140	4.520	0.620	0.878
Wuhan	6.196	3.815	2.380	0.668
Xian	6.265	4.338	1.926	0.694
Zhengzhou	5.509	3.792	1.717	0.717

Table 4
Property rights, firm complexity, growth opportunity and CEO characteristics across cities

The summary statistics are based on the observations in year 2002. Contract is a dummy variable which equals 1 if the firm has signed at least one formal contract with a client. Helping Hand measures the helping hand from government, which is based on the firm's response to the question "Among government officials that your firm regularly interacts with, what share of their contact is oriented toward helping rather than hindering firms?" Firm size is the natural logarithm of number of employees. I compute a factor score for firm complexity based on firm size, scope of operation, and number of business lines. Firm complexity (dummy) equals one if this factor score is greater than the median value and zero otherwise. CEO ownership indicates the percentage of stock CEO holds of the company. CEO tenure is measured by the number of years the CEO had held the position as of the year of the turnover. Private ownership is the percentage of total shares held by private investors. Foreign ownership is the percentage of total shares held by foreign investors.

City	Contract enforcement	Helping hand	Firm size	Firm complexity dummy	CEO ownership	CEO tenure	Private ownership	Foreign ownership
Benxi	0.833	0.357	5.104	0.433	16.796	5.000	0.821	0.041
Changchun	0.967	0.451	5.280	0.750	9.545	5.250	0.715	0.147
Changsha	1.000	0.369	4.989	0.516	12.094	4.820	0.767	0.095
Chongqing	0.927	0.408	5.501	0.729	10.171	4.000	0.765	0.119
Dalian	0.938	0.255	5.375	0.677	5.137	4.959	0.534	0.375
Guiyang	0.962	0.206	4.919	0.611	16.121	3.743	0.794	0.027
Haerbin	0.966	0.414	4.518	0.431	19.290	4.646	0.800	0.103
Hangzhou	0.936	0.507	5.813	0.800	13.380	4.506	0.757	0.192
Jiangmen	0.935	0.532	5.214	0.478	8.689	5.326	0.496	0.448
Kunming	0.914	0.453	4.850	0.397	5.735	3.489	0.646	0.093
Lanzhou	0.842	0.263	4.161	0.513	14.466	5.571	0.793	0.109
Nanchang	0.957	0.401	5.173	0.594	16.047	5.859	0.757	0.116
Nanning	0.929	0.249	4.606	0.404	10.932	4.125	0.884	0.071
Shenzhen	0.923	0.364	5.826	0.633	5.833	4.319	0.794	0.143
Wenzhou	0.920	0.215	5.004	0.640	24.200	4.943	0.905	0.061
Wuhan	0.957	0.323	5.068	0.663	12.180	4.304	0.780	0.115
Xian	0.912	0.268	4.933	0.603	7.717	4.046	0.799	0.103
Zhengzhou	0.943	0.308	4.750	0.434	22.720	4.976	0.828	0.120

Table 5
Correlation matrix of firm-level independent variables

The correlation matrix is based on the observations in year 2002. Contract is a dummy variable which equals 1 if the firm has signed at least one formal contract with a client. Helping Hand measures the helping hand from government, which is based on the firm's response to the question "Among government officials that your firm regularly interacts with, what share of their contact is oriented toward helping rather than hindering firms?" Firm size is the natural logarithm of number of employees. Scope of operation is measured by a dummy that equals to 1 when the firm sells products to more than two provinces in China. # Business lines measures the number of business lines the firm possesses. CEO ownership indicates the percentage of stock CEO holds of the company. CEO tenure is measured by the number of years the CEO had held the position as of the year of the turnover. CEO-Chairman dummy indicates CEO is also the chairman of the board. R&D intensity is the ratio of research and development (R&D) expenditure to book value of assets. Private ownership is the percentage of total shares held by private investors. Foreign ownership is the percentage of total shares held by foreign investors. ROA_{t-1} is the ratio of net income to book value of assets in the previous year. Firm age is the number of years since establishment. Access to Finance is a dummy variable, which equals one if the firm has at least one bank loan and zero otherwise. * indicate significance at 5%.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Contract enforcement	1															
2	Helping hand	0.0473	1														
3	Firm size	0.0610*	0.0973*	1													
4	Scope of operation	0.1295*	0.0126	0.2696*	1												
5	# Business lines	0.0119	-0.024	0.0732*	0.0640*	1											
6	CEO ownership	0.053	0.0191	-0.2181*	-0.0407	-0.0393	1										
7	CEO tenure (years)	-0.0046	-0.0062	-0.0415	-0.0960*	-0.0085	0.1659*	1									
8	CEO-Chairman (dummy)	-0.0308	0.0269	-0.1615*	-0.1001*	-0.0361	0.3839*	0.1549*	1								
9	CEO autonomy power	0.0595*	-0.0347	-0.0267	-0.0127	0.002	0.2258*	0.1398*	0.2564*	1							
10	Reinvestment rate	0.0449	0.1070*	0.0463	0.1056*	-0.0195	0.1008*	-0.0013	0.0272	0.001	1						
11	R&D intensity	0.0402	0.06	0.054	0.1461*	-0.0017	0.0327	0.018	0.0066	-0.0056	0.0788*	1					
12	Firm age	-0.008	-0.028	0.3422*	0.1054*	0.0641*	-0.1115*	-0.034	0.0738*	0.0069	-0.0115	-0.0157	1				
13	Private ownership	-0.0051	-0.0588	-0.2885*	-0.0461	-0.0227	0.2511*	0.0192	0.1580*	0.0225	0.0967*	0.0147	-0.1193*	1			
14	Foreign ownership	-0.0126	0.0858*	0.0991*	0.0077	-0.038	-0.1429*	0.0474	-0.1462*	-0.0371	-0.1250*	0.0419	-0.1361*	-0.6687*	1		
15	ROA_{t-1}	-0.0097	0.0543	0.0272	0.0566	-0.0118	0.0591	0.0239	-0.0064	-0.0711*	0.1469*	0.1415*	-0.0942*	0.0405	0.0224	1	
16	Acess to finance	0.0531	0.0547	0.3602*	0.2007*	0.0248	-0.0621*	-0.0662*	-0.1315*	-0.0704*	0.1196*	0.048	0.0775*	-0.0752*	0.0345	0.0416	1

Table 6
Do weak property rights and complex firms have larger boards?

The dependent variable is log of board size. I compute a factor score for firm complexity based on firm size, scope of operation, and number of business lines. Firm complexity (dummy) equals one if this factor score is greater than the median value and zero otherwise. Heteroskedasticity-consistent standard errors clustered at the city-industry level are reported in brackets below the coefficients. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

	Log (board size)							
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Institutions								
Contract enforcement	0.0525	0.0490					0.0191	0.0125
	[0.046]	[0.045]					[0.052]	[0.061]
Helping hand	0.0172	0.0004					0.0313	0.0344
	[0.039]	[0.041]					[0.040]	[0.045]
Firm Complexity								
Firm size			0.0787***	0.0752***				
			[0.011]	[0.011]				
Scope of operation			0.0426	0.0415				
			[0.028]	[0.027]				
# Business lines			0.0130	0.0217				
			[0.015]	[0.013]				
Firm complexity (dummy)					0.1201***	0.1168***	0.1122***	0.0837**
					[0.027]	[0.029]	[0.031]	[0.035]
CEO Characteristics								
CEO ownership				-0.0024***				
				[0.001]				
CEO tenure (years)				-0.0007				
				[0.003]				
CEO-Chairman (dummy)				-0.0741**	-0.1094***	-0.0946***	-0.0953***	-0.0957***
				[0.030]	[0.025]	[0.027]	[0.028]	[0.032]

CEO autonomy power					-0.0616	-0.1127	-0.1008	-0.0878
					[0.110]	[0.118]	[0.119]	[0.131]
Growth Opportunity								
Reinvestment rate						-0.0637*	-0.0621*	-0.0690
						[0.038]	[0.037]	[0.042]
R&D intensity						0.4505	0.5254	0.6978*
						[0.362]	[0.362]	[0.415]
Other Firm-Level Controls								
Private ownership	-0.1233***	-0.1096***	-0.0185	0.0453	-0.0759**	-0.0675*	-0.0659	-0.0339
	[0.039]	[0.040]	[0.039]	[0.040]	[0.038]	[0.038]	[0.040]	[0.045]
Foreign ownership	-0.1367**	-0.1090**	-0.0648	-0.0450	-0.1207**	-0.1215**	-0.1029*	-0.0932
	[0.053]	[0.055]	[0.056]	[0.058]	[0.053]	[0.056]	[0.056]	[0.064]
Listed (dummy)	0.3897***	0.3993***	0.3007***	0.2553***	0.3704***	0.3877***	0.3876***	0.3697***
	[0.042]	[0.043]	[0.043]	[0.045]	[0.042]	[0.043]	[0.046]	[0.052]
Firm age	0.0504***	0.0493***	0.0210	0.0272*	0.0504***	0.0547***	0.0583***	0.0679***
	[0.015]	[0.015]	[0.014]	[0.016]	[0.015]	[0.015]	[0.015]	[0.016]
ROA_{t-1}	0.1677***	0.1608***	0.1169*	0.1092*	0.1334**	0.1330**	0.1625**	0.1823**
	[0.059]	[0.058]	[0.061]	[0.065]	[0.059]	[0.067]	[0.069]	[0.086]
Acess to finance	0.1007***	0.1063***	0.0493*	0.0475	0.0820***	0.1064***	0.0966***	0.0856**
	[0.028]	[0.028]	[0.028]	[0.031]	[0.025]	[0.027]	[0.030]	[0.034]
City-Level Controls								
Log (GDP)	0.0810***							
	[0.028]							
Log (GDP per capita)	-0.0404							
	[0.027]							
# Colleges	0.0003							
	[0.001]							
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No

City dummies	No	Yes	Yes	Yes	Yes	Yes	Yes	No
Industry-city dummies	No	No	No	No	No	No	No	Yes
Constant	1.3218***	1.8354***	1.4900***	1.4466***	1.9435***	1.8881***	1.8292***	0.9994***
	[0.164]	[0.093]	[0.095]	[0.106]	[0.085]	[0.095]	[0.095]	[0.107]
N	1,043	1,043	1,077	926	1,107	998	941	941
Adjusted R^2	0.145	0.161	0.207	0.240	0.191	0.201	0.203	0.213

Table 7
Do weak property rights and firm complexity drive more outsiders on the board?

The dependent variable is log of the number of outsiders on the board. I compute a factor score for firm complexity based on firm size, scope of operation, and number of business lines. Firm complexity (dummy) equals one if this factor score is greater than the median value and zero otherwise. Heteroskedasticity-consistent standard errors clustered at the city-industry level are reported in brackets below the coefficients. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

	Log (outsiders)							
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Institutions								
Contract enforcement	0.1262	0.1294					0.1245	0.0243
	[0.077]	[0.080]					[0.089]	[0.121]
Helping hand	-0.2381***	-0.2289***					-0.1840***	-0.1627**
	[0.068]	[0.066]					[0.061]	[0.075]
Firm Complexity								
Firm size			0.0260	0.0189				
			[0.021]	[0.020]				
Scope of operation			0.0936*	0.1094*				
			[0.056]	[0.056]				
# Business lines			-0.0228	-0.0185				
			[0.036]	[0.035]				
Firm complexity (dummy)					0.1047*	0.1078**	0.0583	0.0595
					[0.053]	[0.053]	[0.056]	[0.068]
CEO Characteristics								
CEO ownership				-0.0038***				
				[0.001]				
CEO tenure (years)				0.0066				
				[0.007]				
CEO-Chairman (dummy)				-0.3657***	-0.3831***	-0.3928***	-0.3647***	-0.3375***

				[0.053]	[0.047]	[0.052]	[0.054]	[0.063]
CEO autonomy power					-0.2653	-0.4402**	-0.3253*	-0.2556
					[0.189]	[0.199]	[0.194]	[0.231]
Growth Opportunity								
Reinvestment rate						-0.1709**	-0.1356*	-0.1561*
						[0.068]	[0.071]	[0.080]
R&D intensity						1.3974	0.8591	0.9936
						[0.863]	[0.873]	[0.920]
Other Firm-Level Controls								
Private ownership	-0.0416	-0.0471	-0.0045	0.1557*	0.0241	-0.0784	-0.0025	0.0214
	[0.090]	[0.090]	[0.086]	[0.084]	[0.081]	[0.080]	[0.087]	[0.102]
Foreign ownership	0.3825***	0.3689***	0.3745***	0.4060***	0.3173**	0.1665	0.2603*	0.2783*
	[0.141]	[0.140]	[0.115]	[0.138]	[0.127]	[0.130]	[0.136]	[0.158]
Listed (dummy)	0.6326***	0.5920***	0.5482***	0.4867***	0.5532***	0.6027***	0.5536***	0.5237***
	[0.118]	[0.118]	[0.103]	[0.127]	[0.115]	[0.121]	[0.123]	[0.146]
Firm age	-0.1136***	-0.1344***	-0.1359***	-0.1105***	-0.1184***	-0.1254***	-0.1202***	-0.1119***
	[0.031]	[0.033]	[0.031]	[0.032]	[0.029]	[0.028]	[0.031]	[0.036]
ROA_{t-1}	0.0867	0.1481	0.0561	0.1435	0.0716	0.1014	0.1853	0.0855
	[0.143]	[0.148]	[0.146]	[0.163]	[0.141]	[0.156]	[0.159]	[0.182]
Acess to finance	0.0942	0.0807	0.0485	0.0250	0.0214	0.0655	0.0518	0.0543
	[0.060]	[0.063]	[0.054]	[0.065]	[0.057]	[0.061]	[0.064]	[0.076]
City-Level Controls								
Log (GDP)	0.2677***							
	[0.042]							
Log (GDP per capita)	-0.0009							
	[0.036]							
# Colleges	-0.0014							
	[0.002]							

Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
City dummies	No	Yes	Yes	Yes	Yes	Yes	Yes	No
Industry-city dummies	No	No	No	No	No	No	No	Yes
Constant	-0.6396*	0.7396***	0.5649*	0.4722*	0.9014***	1.0753***	0.7927***	0.8989***
	[0.373]	[0.271]	[0.299]	[0.285]	[0.286]	[0.142]	[0.295]	[0.196]
N	1,043	1,043	1,077	926	1,107	998	941	941
Adjusted R^2	0.194	0.208	0.188	0.252	0.250	0.236	0.273	0.255

Table 8
Do property rights and growth opportunity affect the proportion of insiders on the board?

The dependent variable is the proportion of insiders on the board. I compute a factor score for firm complexity based on firm size, scope of operation, and number of business lines. Firm complexity (dummy) equals one if this factor score is greater than the median value and zero otherwise. Heteroskedasticity-consistent standard errors clustered at the city-industry level are reported in brackets below the coefficients. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

	Fraction of insiders							
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Institutions								
Contract enforcement	-0.0508	-0.0513					-0.0536	-0.0188
	[0.031]	[0.033]					[0.036]	[0.048]
Helping hand	0.1055***	0.0961***					0.0763***	0.0705**
	[0.027]	[0.026]					[0.025]	[0.030]
Growth Opportunity								
Reinvestment rate			0.0871***	0.0696**	0.0772***	0.0780***	0.0642**	0.0682**
			[0.028]	[0.030]	[0.028]	[0.028]	[0.028]	[0.032]
R&D intensity			-0.0876	-0.3312	-0.2589	-0.2492	-0.2344	-0.2707
			[0.423]	[0.409]	[0.369]	[0.372]	[0.376]	[0.393]
CEO Characteristics								
CEO ownership				0.0012**				
				[0.000]				
CEO tenure (years)				-0.0019				
				[0.003]				
CEO-Chairman (dummy)				0.1551***	0.1550***	0.1540***	0.1532***	0.1396***
				[0.021]	[0.020]	[0.020]	[0.022]	[0.025]
CEO autonomy power					0.1444*	0.1470*	0.1676*	0.1484
					[0.082]	[0.083]	[0.085]	[0.100]
Firm Complexity								
Firm complexity (dummy)						-0.0151	-0.0046	-0.0129

						[0.026]	[0.027]	[0.032]
Other Firm-Level Controls								
Private ownership	0.0144	0.0179	0.0238	-0.0207	0.0081	0.0065	0.0016	-0.0077
	[0.037]	[0.037]	[0.037]	[0.037]	[0.034]	[0.034]	[0.035]	[0.040]
Foreign ownership	-0.2136***	-0.2084***	-0.1546**	-0.1536**	-0.1368**	-0.1387**	-0.1615**	-0.1776**
	[0.064]	[0.065]	[0.065]	[0.065]	[0.060]	[0.060]	[0.063]	[0.072]
Listed (dummy)	-0.1395***	-0.1182**	-0.1213**	-0.0928*	-0.1084**	-0.1055**	-0.1070**	-0.0989*
	[0.051]	[0.050]	[0.048]	[0.048]	[0.047]	[0.048]	[0.050]	[0.059]
Firm age	0.0546***	0.0633***	0.0679***	0.0583***	0.0586***	0.0595***	0.0567***	0.0542***
	[0.013]	[0.013]	[0.014]	[0.013]	[0.013]	[0.013]	[0.012]	[0.015]
ROA_{t-1}	-0.0195	-0.0466	-0.0304	-0.0612	-0.0197	-0.0212	-0.0634	-0.0220
	[0.066]	[0.068]	[0.073]	[0.078]	[0.072]	[0.071]	[0.074]	[0.083]
Acess to finance	-0.0236	-0.0176	-0.0256	-0.0159	-0.0097	-0.0070	-0.0061	-0.0117
	[0.025]	[0.026]	[0.026]	[0.029]	[0.026]	[0.026]	[0.026]	[0.031]
City-Level Controls								
Log (GDP)	-0.1041***							
	[0.020]							
Log (GDP per capita)	-0.0112							
	[0.019]							
# Colleges	0.0011							
	[0.001]							
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
City dummies	No	Yes	Yes	Yes	Yes	Yes	Yes	No
Industry-city dummies	No	No	No	No	No	No	No	Yes
Constant	1.2318***	0.7259***	0.7411***	0.7836***	0.6706***	0.6682***	0.6632***	0.5692***
	[0.175]	[0.119]	[0.095]	[0.074]	[0.115]	[0.116]	[0.147]	[0.085]
N	1,043	1,043	1,004	863	998	998	941	941
Adjusted R^2	0.169	0.184	0.182	0.230	0.238	0.237	0.250	0.233

Table 9
Property rights and board structure: instrumental variable analysis

The dependent variable is either log of board size (Models 1 to 3), log of outsiders (Models 4 to 6), or the proportion of outsiders (Models 7 to 9) on the board. I use three groups of instruments. The main instrumental variables are British administration and city population in 1918-1919. Following Fisman and Svensson (2007), I also use industry-location median of the potentially endogenous variables (Helping hand and Contract enforcement) as the instruments. In addition, the Communist Party leadership of the CEO: Party secretary or Party deputy secretary dummies are used as additional instrumental variables. In Models 3, 6 and 9, I include city dummies instead of city-control variables, and only use the second and third group instruments (industry-location median of the potentially endogenous variables, and the Communist Party leadership of the CEO). I compute a factor score for firm complexity based on firm size, scope of operation, and number of business lines. Firm complexity (dummy) equals one if this factor score is greater than the median value and zero otherwise. Heteroskedasticity-consistent standard errors clustered at the city-industry level are reported in brackets below the coefficients. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

	Log (board size)			Log (outsiders)			Fraction of outsiders		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Institutions									
Contract enforcement	-0.2972*	-0.1662	-0.2019	-0.2613	-0.1452	0.3861	-0.2021	-0.3279	0.2267
	[0.178]	[0.175]	[0.175]	[0.386]	[0.448]	[0.253]	[0.744]	[0.778]	[0.145]
Helping hand	0.1499	0.0854	0.0289	-1.2947**	-1.5615**	-0.1899***	-0.5459**	-0.6762**	-0.0811***
	[0.125]	[0.128]	[0.240]	[0.550]	[0.739]	[0.059]	[0.245]	[0.333]	[0.025]
Firm Complexity									
Firm complexity (dummy)		0.1171***	0.1222***		0.0620	0.0466	0.0359	0.0184	0.0022
		[0.031]	[0.032]		[0.069]	[0.055]	[0.048]	[0.045]	[0.028]
CEO Characteristics									
CEO-Chairman (dummy)		-0.1157	-0.0815		-0.6686**	-0.3493*		-0.2833**	-0.2347**
		[0.118]	[0.116]		[0.300]	[0.192]		[0.140]	[0.111]
CEO autonomy power		-0.0986***	-0.0981***		-0.3177***	-0.3612***		-0.1374***	-0.1620***
		[0.028]	[0.027]		[0.077]	[0.053]		[0.035]	[0.026]
Growth Opportunity									
Reinvestment rate		-0.0536	-0.0573		-0.0108	-0.1404**		-0.0030	-0.0758***
		[0.038]	[0.044]		[0.118]	[0.069]		[0.061]	[0.021]
R&D intensity		0.6144*	0.5676		1.4003	0.8114		0.5141	0.1719
		[0.363]	[0.356]		[1.048]	[0.862]		[0.464]	[0.360]

Other Firm-Level Controls									
Private ownership	-0.1338***	-0.0905**	-0.0688*	-0.0625	-0.0068	0.0010	-0.0230	-0.0071	-0.0000
	[0.042]	[0.040]	[0.040]	[0.095]	[0.093]	[0.084]	[0.046]	[0.044]	[0.034]
Foreign ownership	-0.1613***	-0.1461***	-0.1063*	0.4536***	0.4146**	0.2649**	0.2432***	0.2237***	0.1791***
	[0.053]	[0.054]	[0.058]	[0.152]	[0.168]	[0.134]	[0.075]	[0.074]	[0.065]
Listed (dummy)	0.3856***	0.3799***	0.3878***	0.6946***	0.6646***	0.5538***	0.1595***	0.1609***	0.1293**
	[0.044]	[0.046]	[0.047]	[0.122]	[0.134]	[0.120]	[0.052]	[0.057]	[0.052]
Firm age	0.0460***	0.0578***	0.0547***	-0.1190***	-0.1009***	-0.1159***	-0.0600***	-0.0534***	-0.0427***
	[0.015]	[0.016]	[0.015]	[0.031]	[0.032]	[0.030]	[0.016]	[0.017]	[0.015]
ROA_{t-1}	0.1449**	0.1484**	0.1478**	0.1680	0.1234	0.2029	0.0497	0.0213	0.0845
	[0.068]	[0.072]	[0.071]	[0.156]	[0.186]	[0.157]	[0.078]	[0.107]	[0.089]
Acess to finance	0.1061***	0.0919***	0.1008***	0.1261*	0.0908	0.0470	0.0322	0.0271	0.0126
	[0.028]	[0.029]	[0.029]	[0.066]	[0.068]	[0.061]	[0.029]	[0.032]	[0.025]
City-Level Controls									
Log (GDP)	0.0728***	0.0471*		0.2821***	0.2689***		0.1026***	0.1088***	
	[0.027]	[0.027]		[0.054]	[0.071]		[0.031]	[0.036]	
Log (GDP per capita)	-0.0316	-0.0280		0.0092	-0.0155		0.0206	0.0053	
	[0.028]	[0.026]		[0.054]	[0.072]		[0.034]	[0.038]	
# Colleges	0.0007	0.0008		-0.0008	-0.0016		-0.0006	-0.0010	
	[0.001]	[0.001]		[0.003]	[0.004]		[0.002]	[0.002]	
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City dummies	No	No	Yes	No	No	Yes	No	No	Yes
F-test (P-value)	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
Overidentification test (P-value)	0.6752	0.679	0.2934	0.5837	0.3588	0.1677	0.7871	0.6130	0.1413
FAR test (P-value)	0.0807	0.0299	0.0305	0.0161	0.0049	0.0028	0.0359	0.0514	0.0454
N	1,043	941	941	1,043	941	941	1,043	941	941
Adjusted R^2	0.089	0.172	0.186	0.021	0.059	0.267	0.041	0.167	0.192

Table 10
Property rights, board structure and corporate performance

The dependent variable is return on asset, the ratio of net income to book value of assets. The variable is intended to measure the corporate performance of the firm. Listed dummy is a dummy variable with one indicating the firm is a publicly listed firm. I compute a factor score for firm complexity based on firm size, scope of operation, and number of business lines. Firm complexity (dummy) equals one if this factor score is greater than the median value and zero otherwise. Weak helping hand (dummy) is a dummy variable with one indicating the value of helping hand is less than the median value and zero otherwise. The regressions are based on OLS. Heteroskedasticity-consistent standard errors clustered at the city-industry level are reported in brackets below the coefficients. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

	ROA			
	Model 1	Model 2	Model 3	Model 4
Log (Board size)	0.0065		0.0096	
	[0.016]		[0.016]	
Log (Board size) × Firm complexity (dummy)	0.0090			
	[0.008]			
Log (Outsiders)		-0.0200		0.0102
		[0.025]		[0.020]
Log (Outsiders) × Weak helping hand (dummy)		0.0897**		
		[0.045]		
Log (Board size) × Listed (dummy)			0.0196*	
			[0.010]	
Log (Outsiders) × Listed (dummy)				0.0490*
				[0.027]
CEO Characteristics				
CEO ownership	0.0007**	0.0006	0.0007**	0.0007**
	[0.000]	[0.000]	[0.000]	[0.000]
CEO tenure (years)	-0.0005	-0.0011	-0.0006	-0.0006
	[0.002]	[0.002]	[0.002]	[0.002]
CEO-Chairman (dummy)	-0.0030	0.0005	-0.0044	-0.0035
	[0.012]	[0.013]	[0.012]	[0.013]
Other Firm-Level Controls				
Private ownership	0.0070	0.0280	0.0108	0.0071
	[0.031]	[0.029]	[0.032]	[0.032]
Foreign ownership	0.0454	0.0569	0.0499	0.0433
	[0.041]	[0.040]	[0.042]	[0.042]
Firm age	-0.0261***	-0.0241***	-0.0249***	-0.0236***
	[0.008]	[0.008]	[0.008]	[0.008]
Acess to finance	-0.0125	-0.0109	-0.0124	-0.0101
	[0.013]	[0.012]	[0.012]	[0.012]
Industry dummies	Yes	Yes	Yes	Yes
City dummies	Yes	Yes	Yes	Yes
N	821	787	821	821
Adjusted R^2	0.039	0.044	0.041	0.039

Appendix T1
One-way ANOVA test of major variables by city

This table reports one-way ANOVA test results for major variables that are used in this paper. The null hypothesis, denoted H_0, for the overall F-test for the test is that all 18 cities of the variables produce the same response, on average. Rejection of H_0 indicates evidence of clustering of the variables by city.

	Mean Square		F Statistic	P-Value
	Between Cities	Within Cities		
Contract enforcement	0.425	0.101	4.19	0.000
Helping hand	1.171	0.089	13.10	0.000
Board size	0.521	0.144	3.63	0.000
Outsiders	3.319	0.574	5.78	0.000
Fraction of insiders	0.528	0.103	5.14	0.000