

Does Governance Reform Help? The Impact of Split Share Structure Reform on Corporate Board Structure in Chinese Manufacturing Enterprises

Cheng Zhang^a
Kee Cheok Cheong^b
Ran Li^c
Rajah Rasiah^d
University of Malaya

Abstract: This study explores the determinants of board size and independence in the Chinese manufacturing industry during the periods before and after the split share structure reform. The results show that with the implementation of the Chinese split share structure reform, corporate governance was impacted positively in terms of the greater board independence. Meanwhile, the mainstream view that non-state enterprises are better governed than state enterprises has found no support. Overall the study suggests that one board size and one type of board independence may not fit all firms under different corporate governance environments.

Keywords: Board independence, board size, corporate governance, split share structure reform

JEL classification: G380

1. Introduction

The corporate board is the most important internal corporate governance mechanism in a company, and the determinants of board composition and the manner in which it operates have been hotly debated. Some scholars have found that board composition is primarily determined by the CEO's bargaining power with the rest of the directors (Raheja, 2005; Boone, Casares Field, Karpof, & Rajeja, 2007; Lehn, Patro, & Zhao, 2009). Others have found that board composition is endogenously determined by firm specific characteristics and the trade-off between the costs and benefits of the board's monitoring and advising roles (Arthur, 2001; Iwasaki, 2008).

China provides a rich context for this debate for several reasons. First, it has achieved sustained high growth through a system that is not consonant with mainstream (Western) thinking. This is because the state, as much as the non-state sector, is a key driver of growth. Second, in keeping with its gradualist and pragmatic stance, the government has unleashed a series of reforms as the country makes an economic transition towards the market. As a result, the corporate governance environment is constantly changing. Third,

^a Institute of Graduate Studies, University of Malaya, 50603 Kuala Lumpur, Malaysia. Email: danazhangcheng@siswa.um.edu.my

^b Institute of China Studies, University of Malaya, 50603 Kuala Lumpur, Malaysia. Email: cheongkeecheok@um.edu.my (Corresponding author)

^c Institute of China Studies, University of Malaya, 50603 Kuala Lumpur, Malaysia. Email: liran@um.edu.my

^d Faculty of Economics and Administration, University of Malaya, 50603 Kuala Lumpur, Malaysia. Email: rajah@um.edu.my

this approach has itself generated considerable debate. Scholars wedded to Western mainstream thinking believe that *ad hoc* reforms will inevitably come to grief, and that China has no choice but to converge to the Western model (Minxin, 2006). This raises the question of whether specific reforms have the desired impact. In terms of governance reforms, the question is whether the reforms strengthen governance in the manner predicted by theory. Fourth, doubts have been further raised by the fact that the Chinese reform approach has separated ownership reform from governance reforms on the premise that benefits can still accrue. This is because Western mainstream thinking is dominated by the trade-off between performance and ownership alone.

A particularly important governance reform is the split-share reform. This consists of reducing state ownership by converting a portion of the state shareholders' (non-tradable) shares to tradable shares on the stock market. This reform is the focus of this study. Its significance lies in leveling the playing field between state and non-state stakeholders and is thus a major step forward in corporate governance.

Given the above focus, the first objective of this study is to identify the determinants of board size and independence in the unique context of China's reforms by targeting its manufacturing industry. The manufacturing industry is selected because it contains a large number of enterprises affected by the above reform. Sectors like finance and energy are considered 'strategic' (vital for national security) and dominated by 100% state-owned enterprises for which this reform is irrelevant. The second objective is then to ascertain if these determinants vary between the pre-reform period and the post-reform period. Since this reform has taken the approach of reducing ownership, but not so much control, an additional objective is to compare the determinants of board size and independence in state-controlled and non-state controlled firms.

In pursuing these objectives, this paper enriches both applicable theories and practice with respect to existing empirical work. Theoretically, it adds new determinants, contextualised to China's situation, to explain corporate governance. Empirically, it pioneers research on the impact of a major corporate reform that has not yet been attempted.

This paper is structured as follows. In the next section, a brief literature review of studies of board composition and independence and their determinants is undertaken. This is followed in Section 3 by the China context which frames the themes discussed, specifically some details on the 'split share' reform, and the issue of state ownership and control under state enterprise reform. Section 4 explains the data and models used in this study. Section 5 presents the findings from the analysis of the data. Section 6 discusses the implications of these findings and draws several conclusions.

2. Literature Review and Hypotheses

As suggested by Boone et al. (2007), there are two competing views in relation to corporate board governance. The first is the inefficient board hypothesis that maintains that corporate boards are structured inefficiently by nature and regulating board composition can add value to the firms. The other is the efficient board hypothesis that states that the corporate board is structured efficiently by nature, and board composition is best endogenously determined by firm specific characteristics and other governance variables. In China, the corporate board is the key internal governance mechanism

that serves to monitor managers on behalf of shareholders. It is at the centre of the corporate governance system since it connects external governance mechanisms (such as government policies, market disciplines, shareholder requirements) with the internal ones (such as managerial incentives, employee training, operations etc). The 'guidelines for introducing independent directors to Chinese listed firms' demand that Chinese listed firms must have at least two independent directors by the end of June 2002, and at least one-third independent directors by the end of June 2003.

Board efficiency issues are mainly based on agency theory, resource dependent theory and power circulation theory (Chen, 2014, Daily & Johnson, 1997). From the agency theory perspective, a corporate board is the connection between shareholders and managers that serves the role of monitoring managers on behalf of shareholders. Specifically, the monitoring role is primarily undertaken by outside independent directors since they are independent of managers (Kim, Mauldin, & Patro, 2014). The agency theory therefore suggests that board composition is determined by the trade-offs between the costs and benefits of board monitoring (Linck, Netter, & Yang 2008).

From the resource dependent theory perspective, the corporate board is the source of expertise that serves the role of providing information and giving advice on the firm's daily operations. Specifically, inside directors have better knowledge regarding firm-specific information that can help mitigate information asymmetry problems between management and the corporate board (Kim et al., 2014). This suggests that board composition is endogenously determined by firm size, diversification and complexity (Hermalin & Weisbach, 2001).

From the perspective of power circulation theory, CEOs and directors tend to shift their coalition and power relations. Since, CEOs gain benefits from the power they wield, they tend to try limiting the role of directors who challenge their power. Under this theory, directors serve the function of monitoring managers and constrain their entrenchment behaviours, while, powerful CEOs may compromise directors' power (Daily & Johnson, 1997; Ocasio, 1994). Thus, board composition is determined by the bargaining power of the CEO (Hermalin & Weisbach, 2001).

Empirical studies of the determinants of board composition across different countries suggest that these determinants vary across different corporate governance environments and that board composition is not related to monitoring variables. Iwasaki (2008) studied the determinants of Russian board composition and found that the bargaining variable has a greater explanatory power than other variables. Chen & Al-Najjar (2012) studied the determinants of Chinese board composition before the split share structure reform, and found that board size is determined by the scope of a firm's operations while board independence is determined by government regulation.

A number of generic factors from existing theories combine with features unique to China's corporate environment to produce a set of likely determinants of board size and independence in China. As indicated, these generic factors suggested by the theories described above are monitoring, firm size and complexity, and bargaining. Features specific to China are the major role of the state, ownership concentration, a supervisory board system, CEO duality, managerial ownership incentives and product market competition.

Issues have been raised regarding the state's monitoring role in the Chinese context. China allowed state ownership to be retained in both state and non-state controlled firms

(Lau, Fan, Young, & Wu, 2007). State control would not have diminished agency problems arising from these firms, and at the same time, monitoring to prevent such problems from occurring could also have been hampered by state intervention (Wang, 2003, Hu & Leung, 2012). Both Qiang (2003) and Xu and Wang (1999) suggest that state ownership is detrimental to firm performance, and is the major cause of corporate governance inefficiency in China. Given this, it might be argued, as a first set of hypotheses, that state control might lead to efforts to reduce monitoring by reducing board size (Hypothesis 1a) and to diminish board independence (H1b) (See Table 1).

Another characteristic of Chinese listed enterprises is the highly concentrated ownership structure (Shan & Round, 2012). Ownership concentration is an effective mechanism to alleviate the agency problems between shareholders and managers. When ownership is highly concentrated, large shareholders will undertake monitoring activities, since they are more eager to get a return from their investment (Shleifer & Vishny, 1997; Gul, Kim, & Qiu, 2010; Xu & Wang, 1999). This leads to a second set of hypotheses: ownership concentration can substitute for the monitoring role played by corporate boards, hence leading to a smaller (H2a) and less independent board (H2b). A monitoring mechanism unique to China is the supervisory board. China learned from the German-Japanese model with its two-tier board¹ system in establishing the supervisory board system with the enactment of China's 1993 Company Law. Ding, Wu, Li, & Jia (2010) found that after the Chinese company law amendment in 2006, supervisory board size and its meeting frequency had a significant impact on the level of executive compensation, an indication of the supervisory board's monitoring role over managers. Hence, this study hypothesises that a supervisory board could substitute for the monitoring role played by independent directors (H3b), while a larger main board needs a larger supervisory board

Table 1. Hypothesised impact of specific variables on board size and board independence

Variable name	Variable type	Impact on:	
		Board size	Board independence
State ownership	Internal monitoring	Negative (H1a)	Negative (H1b)
Ownership concentration	Internal monitoring	Negative (H2a)	Negative (H2b)
Supervisory board	Internal monitoring	Positive (H3a)	Negative (H3b)
CEO duality	Bargaining	Negative (H4a)	Negative (H4b)
Managerial ownership	Incentive alignment	Negative (H5a)	Negative (H5b)
Product market competition	External monitoring	Negative (H6a)	Negative (H6b)
Firm size	Firm-Specific	Positive (H7a)	
Firm age	Firm-Specific		

¹ Adapted from the German-Japanese corporate governance model, the Chinese supervisory board system was established under the Chinese Company Law, 1993, which stipulated that Chinese listed firms must have a main board of directors and a supervisory board, both of which report to shareholders at the Shareholder Meeting. The key responsibility of a supervisory committee is to monitor the activities of the board and CEO, as well as to monitor financial affairs and business activities on behalf of shareholders. The monitoring role of the supervisory board was greatly expanded after an amendment was made to the Company Law in 2006.

to monitor its behaviour (H3a).

With respect to bargaining variables, a generic variable is CEO duality, that is, the CEO also assuming the position of chairperson. CEO duality strengthens the bargaining position of the CEO and makes expropriation of corporate benefits easier through reducing the effectiveness of board monitoring (Arthur, 2001). It is therefore reasonable to expect strong CEO influence reflected in a smaller board size (H4a) and a smaller number of outside independent directors (H4b).

The managerial ownership incentive is another mechanism to mitigate the agency problems between shareholders and managers. By aligning managers' interests with those of the shareholders, managers would be less inclined towards self-serving behaviour and more motivated to work towards value creation. Therefore, firms with higher managerial ownership do not require a large board or a sizable number of independent directors (Hermalin & Weisbach, 1991). Indeed, Tosi, Katz and Gomez-Mejia(1997) argued that incentive alignment is more effective than monitoring in ensuring that managers act in the interests of shareholders. Hence, this study's fifth set of hypotheses is that managerial stock ownership could lead to a smaller (H5a) and less independent board (H5b).

Product market competition is an external factor that can substitute for the governance role played by internal governance mechanisms (Mayer, 1997; Chou, Sibilkov & Wang, 2011). Greater product market competition could moderate managerial inefficiency, ensure the efficient use of resources (Allen & Gale,1999), and spur productivity growth (Januszewski, Ke, & Winter, 2002; Giroud & Mueller, 2010). With product market competition a substitute for internal governance mechanisms, board size (H6a) and independence (H6b) are hypothesised to be negatively related to the product market competition.

In addition, firm-specific characteristics matter. Given the scale and complexity of operations, a larger firm would need a larger board. However, little can be predicted in relating the age of the firm and the board governance variables in question. Table 1 provides a summary of the above hypotheses.

3. China's Split-Share Structure Reform

Of the numerous reforms the Chinese government launched, the split-share structure reform was one of the most important in terms of governance. It was motivated by the separation of share ownership into non-tradable shares held by the Chinese government and tradable shares held by non-government entities. The state and legal persons² were holders of non-tradable shares that could not be traded in the stock market, so that the government retained absolute control over the listed enterprises. In contrast, tradable shares were public shares that could be traded on the stock exchanges and owned by institutional and individual shareholders. Prior to reform, the former accounted for almost two-thirds of the total number of shares, leaving holders of tradable shares limited power to oppose any decisions made, should these be against their interests (Yeh, Shu, Lee, & Shu, 2009).

This separation of shares caused problems for China's capital market development

² Legal person' is a concept relative to a natural person, which refers to legal organisations including state, corporations, institutions, etc. to execute rights and obligations in law.

(Januszewski et al., 2002). Conflict between holders of non-tradable shares and tradable shares did come to a head. Firstly, the tradable shares were purchased at a premium price. Secondly, because the value of non-tradable shares was not influenced by share price and the firm's market value, there was no incentive for managers to act in the best interests of the enterprise and, hence, also the holders of tradable shares. Controlling shareholders who were politically appointed preferred to perform well for the government. Problems of diversion of enterprise assets and profits for their own interests also emerged.

On 29 April 2005, the China Securities Regulatory Commission (CSRC) made the decision to convert non-tradable shares into tradable shares in two batches in a pilot program with 46 enterprises (Firth, Lin, & Zou, 2010; Yeh et al., 2009). To advance and supervise this split share reform, the State-owned Assets Supervision and Administration Commission (SASAC, 2006) formulated specific suggestions to guide state-holding listed enterprises. By then, it was clear that holders of tradable shares and non-tradable shares had to come to a compromise. This took the form of holders of tradable shares getting additional complementary shares from holders of non-tradable shares. SASAC also insisted that for state enterprises in strategic sectors, there was to be a minimum state share proportion. This was because the state would need to retain ownership of state enterprises in strategic sectors considered crucial to the country's national and economic security (SASAC, 2006). State shareholders could purchase additional tradable shares through capital markets to consolidate their control. The release of non-tradable shares for sale was a gradual process, with no more than 5% of the general capital being allowed to be traded after 12 months, 10% after 24 months and 37.41% after 36 months (SASAC, 2005).

The objective of this reform was to let the value of shares be determined by the market, thus overcoming the original problem of non-tradable shares. Moreover, holders of non-tradable shares were given managerial incentives to ensure the enterprise performed its best. With these institutional arrangements in place, the trend towards more tradable shares accelerated, so that by 2012, only a fifth of state enterprise shares were non-tradable (Table 2).

The split share reform was set in the larger context of state enterprise reform in which

Table 2. Tradable and non-tradable shares in China's share markets (2004-2013)

Year	Total issued shares (Billion)	Tradable shares (Billion)	% of shares tradable
2004	714.94	257.71	36.05
2005	762.95	291.48	38.20
2006	1489.76	563.78	37.84
2007	2241.69	1033.15	46.09
2008	2452.29	1257.89	51.29
2009	2616.29	1975.95	75.52
2010	3318.44	2564.2	77.27
2011	3609.55	2885.03	79.93
2012	3839.50	3133.96	81.62
2013	4056.91	3674.42	90.57

Source: Securities market yearly data by China Securities Regulatory Commission (CSRC), from http://www.csrc.gov.cn/pub/csrf_en/marketdata/.

the state was more willing to reduce ownership of enterprises, but keen to retain control of enterprises³ considered to be of strategic importance. This control was exercised through providing a strategic direction to ensure enterprise compliance with state strategies. Thus, the relevant distinction between state and non-state is appropriately that of control rather than ownership. Chinese listed companies can largely be divided into state controlled and non-state controlled firms. Firms controlled by local government, central government, and State Assets Management Bureaus are state controlled with the remaining being non-state controlled firms. The government carefully selects the CEOs and top managers of state controlled firms. CEOs also have incentives to perform well, since most of them have opportunities to be promoted to higher positions in the government. For these firms, the agency problems between managers and shareholders may not be serious, with the main agency problem being between government controlling shareholders and domestic private shareholders. However, non-state controlled firms receive limited monitoring from the government. For these firms, the controlling shareholders prefer to select the CEO, chairman of the board and top managers from among themselves. Hence, the agency problem between managers and shareholders is less serious; the main agency problem is between controlling shareholders and minority shareholders.

4. Methodology

4.1 Data and Sample

The sample for this study was 498 Chinese manufacturing firms listed on the Shanghai and Shenzhen stock exchanges during the period between 2001 to 2011, yielding 5478 observations. Firms that were not continually listed during this period were excluded. The sub-samples used in this study included the pre-reform subsample from 2001 to 2004 and the post-reform subsample from 2008 to 2011. Since it took several years for the reform to be implemented, the start date of the post-reform sub-period was set at three years after the reform to avoid possible estimation biases arising from enterprises that had not fully implemented the reform. The data were from two main sources. The corporate governance and financial data were sourced from the CSMAR database, developed by GTA Information Technology Company Limited (used also by Yeh et al. (2009) and Kang and Kim (2012)). Data on the controlling shareholders came from the SinoFin Information Services database, also used by other studies such as Chen and Al Najjar (2012).

4.2 Model

To analyse the influence of corporate governance variables on board size and board independence, the study applied both static and dynamic regression methods to double check the robustness of our results. Following Chen and Al Najjar (2012), this study applied the OLS with heteroskedasticity-corrected robust standard error as the baseline estimation method. Since our dependent variables have restricted distribution, the limited

³ According to the China Securities and Regulatory Commission, the state can control one enterprise when the state (i) holds directly or indirectly 50% of the total outstanding shares; (ii) controls directly or indirectly 30% of total voting rights; (iii) can use the voting rights to select more than 50% of board directors; (iv) has significant influence over the decision making in shareholder's meeting; and (v) other situations recognised by CSRC.

dependent variable regression method, Tobit model, was applied to check the robustness of our results. To be specific, board size has restricted distribution from 5 to 19 based on the requirement of Chinese Company Law 2005. Board independence has a distribution of more than 0, since the implementation of the ‘Guidelines for introducing independent directors’. The dynamic regression model accounted for the interdependence of board size, board independence and their past values. It was estimated by the two-step GMM system with robust standard error. The diagnostic tests, including Hansen J and AR(2), suggested that the instruments used in the model were valid and that second order serial correlation was not present.

The model discussed above is represented by the following equations.

Static models:

$$Boardsize_{it} = \beta_1 supersize_{it} + \beta_2 stateown_{it} + \beta_3 manaown_{it} + \beta_4 concen1_{it} + \beta_5 duality_{it} + \beta_6 HHI_{it} + \beta_7 lnassets_{it} + \beta_8 lnage_{it} + \beta_9 govern03_i + \beta_{10} govern08_i + u_i \quad (1)$$

$$Boardindependence_{it} = \beta_1 supersize_{it} + \beta_2 stateown_{it} + \beta_3 manaown_{it} + \beta_4 concen1_{it} + \beta_5 duality_{it} + \beta_6 HHI_{it} + \beta_7 lnassets_{it} + \beta_8 lnage_{it} + \beta_9 govern03_i + \beta_{10} govern08_i + u_{it} \quad (2)$$

Dynamic models:

$$Boardsize_{it} = \beta_1 supersize_{it} + \beta_2 stateown_{it} + \beta_3 manaown_{it} + \beta_4 concen1_{it} + \beta_5 duality_{it} + \beta_6 HHI_{it} + \beta_7 lnassets_{it} + \beta_8 lnage_{it} + \beta_9 govern03_i + \beta_{10} govern08_i + \beta_{11} Boardsize_{it-1} + \beta_{12} Boardindependence_{it} + u_{it} \quad (3)$$

$$Boardindependence_{it} = \beta_1 supersize_{it} + \beta_2 stateown_{it} + \beta_3 manaown_{it} + \beta_4 concen1_{it} + \beta_5 duality_{it} + \beta_6 HHI_{it} + \beta_7 lnassets_{it} + \beta_8 lnage_{it} + \beta_9 govern03_i + \beta_{10} govern08_i + \beta_{11} Boardsize_{it} + \beta_{12} Boardindependence_{it-1} + u_{it} \quad (4)$$

Board size (Boardsize) is measured by the total number of directors on the board. Board independence (Boardinde) is proxied by the percentage of independent directors⁴ on the corporate board. State ownership (Stateown) is measured by the percentage of shares owned by the state. Ownership concentration (concen1) is the percentage of shares owned by the largest shareholders. Supervisory board size (Supersize) is the number of directors on the supervisory board. CEO duality (duality) has the value of 1 if CEO and the Chairman of board is the same person and 0 otherwise. “Manaown” is the manager’s ownership of the company stock measured by the percentage of shares owned by the top three managers. The degree of product market competition or industry concentration is proxied by the Herfindahl–Hirschman Index (HHI). It ranges from 0 to 1 and is calculated by the sum of the squared market shares of each firm within the same industry. The market share of each firm is based on the percentage of firm sales over the industry sales. A higher HHI value means higher industry concentration and lower market competition, and *vice versa*. Firm size (lnassets) is measured by the natural logarithm of a firm’s total assets. Firm age (lnage) is the number of years since the establishment of the firm. The variable ‘govern03_i’ is the year indicator that represents the implementation of guidelines for introducing independent directors, whereby it is equal to 1 for year after 2003 and 0

⁴ According to CSRC 2001, an independent director is one who does not hold any position in the company other than director and has no relationship with the company and its major shareholders.

otherwise. The variable 'govern08_{*i*}' represents the completion of the split-share structure reform, whereby it is equal to 1 for year after 2007 and 0 otherwise.

5. Findings

Table 3 shows the descriptive statistics of the full sample. In order to remove the effect of outliers and extreme values, all the variables used in this study were winsorized at 1 % in each tail of the distribution. The dependent variable, board size, has an average of around 9 to 10 people. The average proportion of independent directors is about 31%, which is a bit lower than the CSRC expected minimum of 33.3% of independent directors. This suggests that the Chinese corporate board is still dominated by insiders and that only about 3 out of 10 directors are independent, whereas in the developed countries, like the US, the corporate board is dominated by outsiders (Boone et al., 2007). The supervisory board in China has about 4 people, almost similar to the number of independent directors. On average, state ownership of about 27% is still retained in Chinese listed firms. The average ownership held by the largest shareholder is about 42%. Eleven out of 100 firms have the CEO duality phenomenon. The study also examined the correlations between the examined variables. We found the highest correlation coefficient to be 0.58, that between ownership concentration and firm age. The variance inflation factor has a mean value of 1.45, suggesting that multicollinearity is not a serious problem in this study.

5.1 Variations across Time Periods and Type of Firms

Given the centrality of the split-share reform and the debate over the effectiveness of state-controlled and other enterprises, it is important to compare differences in the target variables, including board size, board independence and their determinants pre- and post-reform, and also between state-controlled and other firms. The numbers in Table 4 reveal major changes that had taken place after the split share reform and between state-controlled and private-controlled firms. All the these differences are significant at the 0.001 level.

On one hand, board size and supervisory board size decreased after the reform, while the percentage of independent directors increased. The reduction in supervisory board

Table 3. Descriptive statistics

Stats	N	Mean	Std deviation	Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum
Boardsize	5478	9.3764	1.9409	5	9	9	11	15
Boardinde	5478	0.3151	0.1042	0	0.3333	0.3333	0.3636	0.5000
Supersize	5478	4.1993	1.2965	3	3	4	5	8
Stateown	5478	0.2722	0.2556	0	0	0.2667	0.5065	0.7500
Manaown	5478	0.0006	0.0027	0	0	0.0000	0.0002	0.0233
Concen1	5478	0.4266	0.1750	0.0945	0.2818	0.4190	0.5687	0.7844
Duality	5478	0.1194	0.3243	0	0	0	0	1
Inassets	5478	21.4664	1.0912	18.9644	20.7431	21.3867	22.0709	24.7779
Inage	5478	8.2414	0.4576	6.8814	8.0124	8.3257	8.5755	9.0094
HHI	5478	0.1586	0.1867	0.0269	0.0508	0.0947	0.1637	1

Table 4. T-test of mean differences

Target variables and determinants	Pre- vs. Post-reform			State-controlled vs. Private		
	Pre-reform	Post-reform	Mean difference	State-control	Private-control	Mean difference
boardsize	9.6000	9.1500	0.4528***	9.4538	9.0995	0.3543***
boardinde	0.2438	0.3614	-0.1176***	0.3109	0.3302	-0.0193***
supersize	4.3500	4.0500	0.2967***	4.2583	3.9883	0.2700***
stateown	0.3900	0.1300	0.2602***	0.2982	0.1792	0.1190***
manaown	0.0005	0.0008	-0.0003***	0.0005	0.0011	-0.0006***
concen1	0.5288	0.3525	0.1763***	0.4352	0.3960	0.0392***
concen5	0.6171	0.4702	0.1468***	0.5445	0.5252	0.0194***
duality	.1124	.1325	-0.0201	0.1100	0.1530	-0.0430***
HHI	0.1431	0.1734	-0.0304***	0.1578	0.1615	-0.0037***
Inassets	21.1538	21.7916	-0.6379***	21.5159	21.2894	0.2265***
Inage	7.8698	8.5748	-0.7050***	8.2317	8.2761	0.0444***

members occurred with greater board independence, suggesting that the latter had become more important as a monitoring mechanism. On the other hand, state ownership and ownership concentration all decreased significantly after reform, indicating that the ownership decentralised from the state and large shareholders to individual shareholders. Other variables, including CEO duality, managerial ownership and product market competition did not change much.

Between state-controlled and other firms, major differences in the target variables and determinants also existed. Not unexpectedly, state-controlled firms had larger boards, but a smaller percentage of independent directors. The supervisory board sizes were significantly larger while CEO duality much less important. These opposing factors do not make it easy to pronounce which type of firms had better governance, and certainly cannot support the often-made statement that state-controlled firms were poorly governed.

5.2 Regression Analysis of the Relationship Between Corporate Governance and Board Composition

The regression analysis of corporate governance and board composition is shown in three parts. Section 5.2.1 illustrates the determinants of board size and independence using the full sample, followed by Sections 5.2.2 and 5.2.3 that exhibit the comparative analysis of the sub-samples. The results are summarised in Table 5, which highlights the variables that are significant and the sign of the coefficients.

5.2.1 Overall Determinants of Board Size and Independence

Overall, the determinants of board size and board independence in the Chinese manufacturing industry are illustrated in Table 6. The estimation using OLS, Tobit and GMM methods showed consistent results, suggesting that our results are reliable.

To be specific, supervisory board size is positively related to board size and negative related to board independence. This finding is consistent with the argument of Chen and Al Najjar (2012) that the supervisory board's key function of monitoring and advising determines the positive relationship between supervisory board size and board size,

Table 5. Summary of findings

	Board size					Board independence				
	Full	Pre-	Post-	State	Private	Full	Pre-	Post-	State	Private
Supersize	+	+	+	+	+	-	-	-	-	-
Stateown	+	+	+	+	+	-	+	+	+	+
Manaown	-	-	+	-	+	-	+	-	-	-
Concen1	-	-	-	-	-	+	-	+	+	-
Duality	-	-	-	-	-	+	+	-	+	+
Inassets	+	+	+	+	+	+	+	+	+	+
Inage	-	-	-	-	-	+	+	+	+	+
HHI	-	-	-	-	+	-	-	-	-	-
Govern03	-	-	-	-	-	+	+	+	+	+
Govern08	-	-	-	-	-	+	+	+	+	+

“+” indicates positive effect; “-” indicates negative effect.

*, **, ***, represents $p < 0.05$, $p < 0.00$, $p < 0.001$

Table 6. Determinants of board size and board independence

	Board size			Board independence		
	OLS	Tobit	GMM	OLS	Tobit	GMM
Supersize	0.425***	0.432***	0.195***	-0.00329***	-0.00338***	-0.000819
Stateown	0.340**	0.346**	0.0131	-0.000524	-0.000177	-0.00209
Manaown	-7.131	-6.567	-5.721	-0.566*	-0.558	-0.661***
Concen1	-1.452***	-1.491***	-0.419	0.0136	0.0146	-0.0107
Duality	-0.119	-0.127	-0.103	0.00171	0.00167	0.00287
Inassets	0.407***	0.413***	0.107**	0.00331***	0.00345***	0.00456**
Inage	-0.471***	-0.468***	-0.208*	0.0209***	0.0227***	-0.00122
HHI	-0.488***	-0.509***	-0.227*	-0.0117*	-0.0119*	-0.0211***
Govern03	-0.0405	-0.0409	0.172	0.178***	0.188***	0.0421***
Govern08	-0.284***	-0.292***	0.0691	0.0103***	0.00973***	0.00446*
L1.boardsize			0.632***			
Boardinde			-6.410***			
L1. boardinde						0.204***
Boardsize						-0.00648*
constant	3.495***	3.313***	4.236***	-0.0672	-0.0946**	0.221***
N	5478	5478	4980	5478	5478	4980
adj. R ²	0.166			0.534		
Hansen J			0.145			0.132
AR(2)			0.273			0.558

*, **, ***, represents $p < 0.05$, $p < 0.00$, $p < 0.001$

since a large board of directors needs a large supervisory board. Due to the overlapping functions between independent directors and supervisory board, the supervisory board tends to substitute independent directors. But inconsistent with their findings, we found that state ownership is an important contributor towards board size and is not substituted

by independent directors. This is because state shareholders want more directors on the board to delegate the government's interests as board independence is emphasised by government regulations as a symbol of good corporate governance, thus, state ownership cannot substitute board independence.

We also found that managerial ownership reduces board independence. This is possibly because managers tend to entrench themselves, whereas independent directors can constrain management entrenchment. Hence, board independence reduces with managerial ownership. Furthermore, we found that ownership concentration reduces board size significantly. This is because the large shareholders usually involve themselves in the managing process, and tend to substitute the corporate board in monitoring managerial behaviours and advising them. The industry concentration was found to negatively affect both board size and board independence. This can be explained by industry concentration associated with less market competition, lessening the value of a good governance system, when there is no competition. Thus, board size and board independence are reduced with industry concentration. Finally, the government regulation of 'guidelines for introducing independent directors' was found to significantly improve board independence, which confirmed the important role the government plays in the corporate governance system. The split-share structure reform significantly reduced board size and improved board independence, suggesting that the reform tends to transform Chinese corporate board to be more outsider-dominant.

5.2.2 Determinants of Board Size and Independence: Pre-reform and Post-reform

Splitting the sample into a pre- and post-reform period and estimating the determinants of board size and independence for each period reveal some changes between the periods. Table 7 illustrates the differences of the investigated factors between the pre-reform and post-reform period.

Firstly, the impact of state ownership is seen to contribute to board independence significantly before the reform, and board size significantly after the reform. Before the reform, state ownership accounted for 39% on average, since the Chinese government is the key promoter of board independence. Thus, state ownership improved board independence significantly before the reform. After reform, when the state ownership is decentralised to individual shareholders to a large extent, the influence of state ownership on board independence is also reduced. But the significant improvement in board size after reform, means that state shareholders need more directors to delegate their interests.

Secondly, ownership concentration was negatively related to board independence before the reform, but the relationship is not found to be significant after the reform. This can be explained by the different degrees of ownership concentration before and after the reform. Before the reform, the ownership held by the largest shareholders was concentrated at around 52.8%, hence, they were able to substitute independent directors to monitor managerial behaviours; after the reform, as ownership was dispersed, its influence over the corporate board was also reduced.

Thirdly, the substitution effect between managerial ownership and board independence was significant after the reform. It suggests that after the reform, the incentive alignment between managers and shareholders alleviated agency problems,

Table 7. Determinants of board size and board independence: pre- and post-reform

	Board size		Board independence		
	Pre-reform	Post-reform	Pre-reform	Post-reform	
Supersize	0.453***	0.359***	-0.00839***	-0.00288**	
Stateown	0.254	0.757***	0.0754***	0.00149	Differ
Manaown	-18.26	2.402	1.318	-1.099***	Differ
Concen1	-1.634***	-1.141***	-0.245***	0.000717	Differ
Duality	-0.151	-0.00243	0.00353	-0.00435	
Inassets	0.397***	0.421***	0.0203***	0.000675	Differ
Inage	-0.236*	-0.581***	0.0446***	0.0111*	
HHI	-0.506*	-0.346*	-0.00990	-0.0190***	Differ
constant	1.951	3.867**	-0.398***	0.267***	
N	1992	1992	1992	1992	
adj. R ²	0.131	0.186	0.148	0.013	

*, **, ***, represents $p < 0.05$, $p < 0.00$, $p < 0.001$

Table 8. Determinants of board size and board independence: State-controlled and Private-controlled enterprises

	Board size		Board independence		
	State-control	Private-control	State-control	Private-control	
Supersize	0.389***	0.534***	-0.00250**	-0.00537***	
Stateown	0.0986	0.981***	0.00987	0.00328	Differ
Manaown	-12.74	6.762	-0.632*	-0.719	Differ
Concen1	-1.114***	-2.770***	0.0214*	-0.0277	Differ
Duality	-0.117	-0.0909	0.000276	0.00375	
Inassets	0.424***	0.338***	0.00379***	0.00229	
Inage	-0.431***	-0.626***	0.0224***	0.0161*	
HHI	-0.586***	0.0770	-0.00633	-0.0221	Differ
Govern03	-0.0467	-0.204	0.184***	0.147***	
Govern08	-0.310***	-0.295*	0.0123***	0.00939*	
constant	2.929**	6.163***	-0.109**	0.0533	
N	4282	1196	4282	1196	
adj. R ²	0.148	0.230	0.554	0.436	

thus, leading to substitution of the independent directors' monitoring role. Furthermore, we found that industry concentration substituted board independence after reform, which means that market competition played a more significant role after reform.

5.2.3 Determinants of Board Size and Independence: State and Private Enterprises

Splitting the sample into state and private enterprises, the variations of the investigated effects are shown in Table 8.

We found that the state ownership improved board size significantly in private enterprises, suggesting that although the state is not the dominated shareholder in private enterprises, its impact on private enterprises is still significant. The ownership

concentration positively affects board independence in state enterprises, suggesting that when the largest shareholder is the state, it tends to improve board independence. However, the incentive alignment through managerial ownership significantly reduced board independence in state enterprises, which means that managers in state enterprises have more opportunities to impede monitoring. The industry concentration reduced board size only in state enterprises, which means that industry concentration results in less market competition, thus impeding board size more significantly in state enterprises.

6. Conclusion

This study used data from a sample of 498 firms in the Chinese manufacturing industry over a period of eight years to estimate the relationship between board governance variables (board size and independence) and their determinants. The objectives were to identify the major determinants of board size and independence, to ascertain the impact, if any, of the split-share structure reform in 2005, and to empirically verify if the oft-cited allegations of poor governance, state-appointed management and self-serving behaviour of state-controlled firms have substance. In doing so, it has extended empirical research on China that has hitherto neither dealt with this topic nor incorporated external governance as a determinant of board governance.

In addressing the first objective, this study confirms the role of monitoring variables, which is in accord with some research (Raheja, 2005; Boone et al., 2007; Lehn et al., 2009) but finds bargaining variables to be unimportant, contradicting the findings of others (Arthur, 2001; Iwasaki, 2008). An important finding pertains to China's use of a supervisory board, which functions as an alternative to independent directors, an established institution in other countries.

Comparing estimates before and after the split-share reform, what has emerged is the more important role played by regulations emanating from governance reforms that complemented the split-share reform. These regulations have displaced the internal monitoring factors in ensuring adequate governance through the mandating of independent directors. Thus, China's governance reforms have moved the country towards rules-based governance, and closer to the mainstream governance model of the advanced West.

Finally, in addressing board governance of state-controlled and other firms, the argument that state involvement, whether through ownership or control, leads to more self-serving behaviour has found no support. If this is the case with state control, it would also be true of state ownership, which, as the data show, has shrunk substantially to represent no more than a small fraction of firms. Also the unimportance of bargaining variables for state-controlled firms suggests that the bargaining power of managers of these firms has not undermined their governance.

References

- Allen, F. & Gale, D. (1999). *Corporate governance and competition*, Center for Financial Institutions Working Papers from Wharton School Center for Financial Institutions, University of Pennsylvania. Available: <http://EconPapers.repec.org/RePEc:wop:pennin:99-28>
- Arthur, N. (2001). Board composition as the outcome of an internal bargaining process: empirical evidence. *Journal of Corporate Finance*, 7, 307-340

- Boone, A. L., Casares Field, L., Karpoff, J. M., & Raheja, C. G. (2007). The determinants of corporate board size and composition: An empirical analysis. *Journal of Financial Economics*, 85, 66-101.
- Chen, C. H., & Al-Najjar, B. (2012). The determinants of board size and independence: Evidence from China. *International Business Review*, 21, 831-846.
- Chen, M.-Y. (2014). Determinants of corporate board structure in Taiwan. *International Review of Economics & Finance*, 32, 62-78.
- Chou, J., Ng, L., Sibilkov, V., & Wang, Q. (2011). Product market competition and corporate governance. *Review of Development Finance*, 1, 114-130.
- Daily, C.M. & Johnson, J.L. (1997). Sources of CEO Power and Firm Financial Performance: A Longitudinal Assessment. *Journal of Management*, 23, 97-117.
- Ding, S., Wu, Z., Li, Y., & Jia, C. (2010). Executive compensation, supervisory board, and China's governance reform: a legal approach perspective. *Review of Quantitative Finance and Accounting*, 35, 445-471.
- Firth, M., Lin, C., & Zou, H. (2010). Friend or foe? The role of state and mutual fund ownership in the split share structure reform in China. *Journal of Financial and Quantitative Analysis*, 45, 685-706.
- Giroud, X., & Mueller, H. M. (2010). Does corporate governance matter in competitive industries? *Journal of Financial Economics*, 95, 312-331.
- Guest, P. M. (2008). The determinants of board size and composition: Evidence from the UK. *Journal of Corporate Finance*, 14, 51-72.
- Gul, F. A., Kim, J.-B., & Qiu, A. A. (2010). Ownership concentration, foreign shareholding, audit quality, and stock price synchronicity: Evidence from China. *Journal of Financial Economics*, 95, 425-442.
- Hermalin, B.E., & Weisbach, M.S. (1991). The effects of board composition and direct incentives on firm performance. *Financial management*, 20, (4), 101-112.
- Hermalin, B.E., & Weisbach, M.S. (2001). *Boards of directors as an endogenously determined institution: A survey of the economic literature*. Working paper no 8161. National Bureau of Economic Research.
- Hu, F., & Leung, S. C. (2012). Top management turnover, firm performance and government control: Evidence from China's listed state-owned enterprises. *The International Journal of Accounting*, 47, 235-262.
- Iwasaki, I. (2008). The determinants of board composition in a transforming economy: Evidence from Russia. *Journal of Corporate Finance*, 14, 532-549.
- Januszewski, S. I., K Ke, J., & Winter, J. K. (2002). Product market competition, corporate governance and firm performance: an empirical analysis for Germany. *Research in Economics*, 56, 299-332.
- Kang, Y.-S., & Kim, B.-Y. (2012). Ownership structure and firm performance: Evidence from the Chinese corporate reform. *China Economic Review*, 23, 471-481.
- Kim, K., Mauldin, E., & Patro, S. (2014). Outside directors and board advising and monitoring performance. *Journal of Accounting and Economics*, 57, 110-131.
- Lau, C.-M., Fan, D.K.K., Young, M.N., & Wu, S. (2007). Corporate governance effectiveness during institutional transition. *International Business Review*, 16, 425-448.
- Lehn, K. M., Patro, S., & Zhao, M. (2009). Determinants of the size and composition of US corporate boards: 1935-2000. *Financial Management*, 38, 747-780.
- Linck, J., Netter, J., & Yang, T. (2008). The determinants of board structure. *Journal of Financial Economics*, 87, 308-328.
- Mayer, C. (1997). Corporate governance, competition, and performance. *Journal of Law and Society*, 24, 152-176.
- Minxin, P. (2006). *The dark side of China's rise* [Online]. Available: <http://foreignpolicy.com/2009/10/20/the-dark-side-of-chinas-rise/>.

- Ocasio, W. (1994). Political dynamics and the circulation of power: CEO succession in U.S. industrial corporations, 1960-1990. *Administrative Science Quarterly*, 39, 285-312.
- Qiang, Q. (2003). Corporate governance and state-owned shares in China listed companies. *Journal of Asian Economics*, 14, 771-783.
- Raheja, C.G. (2005). Determinants of board size and composition: a theory of corporate boards. *Journal of Financial and Quantitative Analysis*, 40 (2), 283-306.
- Shan, Y.G., & Round, D.K. (2012). China's Corporate governance: emerging issues and problems. *Modern Asian Studies*, 46, 1316-1344.
- Shleifer, A. & Vishny, R. W. (1997). A survey of corporate governance. *The Journal of Finance*. 52 (2), 737-783.
- State-Owned Assets Supervision and Administration Commission. (2005). *Guo wu yuan guo zi wei guan yu guo you kong gu shang shi gong si gu quan fen zhi gai ge de zhi dao yi jian (State-owned Assets Supervision and Administration Commission of the State Council' guidances for state-holding listed enterprises' split-share reform)* [Online]. Available: <http://www.sasac.gov.cn/n1180/n1566/n258222/n259203/1784481.html> [Accessed 25 Aug, 2013].
- (2006). *Guo wu yuan guan yu tui jin guo you zi ben tiao zheng he guo you qi ye chong zu zhi dao yi jian de tong zhi (The State Council' guidance on advancing the adjustment of state capital and restructuring of state enterprises)*.
- Tosi, H. L., Katz, J. P., & Gomez-Mejia, L.R. (1997). Disaggregating the agency contract: The effects of monitoring, incentive alignment, and term in office on agent decision making. *Academy of Management Journal*, 40, 584-602.
- Wang, J. (2003). *Governance role of different types of state-share holders: evidence from China's listed companies*. Hong Kong: Hong Kong University of Science and Technology.
- Xu, X., & Wang, Y. (1999). Ownership structure and corporate governance in Chinese stock companies. *China Economic Review*, 10, 75-98.
- Yeh, Y.-H., Shu, P.-G., Lee, T.-S., & Su, Y.-H. (2009). Non-tradable share reform and corporate governance in the Chinese stock market. *Corporate Governance: An International Review*, 17, 457-475.

Appendix

a. Correlation matrix

	1	2	3	4	5	6	7	8	9	10
1 Boardsize	1									
2 Boardinde	-0.0947	1								
3 Supersize	0.3292	-0.0847	1							
4 Stateown	0.1127	-0.1992	0.1546	1						
5 Manaown	-0.0205	0.003	-0.0379	-0.1423	1					
6 Concen1	0.0152	-0.3611	0.0356	0.5443	-0.1097	1				
8 Duality	-0.0549	0.016	-0.0557	-0.0993	0.0839	-0.1045	-0.0986	1		
9 Inassets	0.2235	0.1738	0.1175	0.0143	-0.0047	0.055	0.0731	-0.0671	1	
10 Inage	-0.0779	0.4648	-0.038	-0.4663	0.0194	-0.5849	-0.5321	0.0606	0.1551	1
11 HHI	-0.0767	0.0193	-0.0747	-0.0988	-0.0124	-0.0939	-0.1149	0.068	-0.0185	0.0563