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The Individual Characteristics of Board Members and Internal Control Weakness:
Evidence from China

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The Individual Characteristics of Board Members and Internal Control Weaknesses:

Evidence from China

Abstract

This study examines the relationships between the individual characteristics of board members and internal control weaknesses using data from Chinese listed firms from 2007 to 2015. The results indicate that the individual characteristics of board members including education, experience, certification ,integrity and training are related to internal control deficiencies. The results also show that the individual characteristics of board chairmen are related to internal control problems. The overall results demonstrate that internal control quality is better, internal control weaknesses are reduced and weakness remediation is more likely to be applied in firms in which board members and board chairpersons have stronger qualifications. Furthermore, ownership has a moderating impact on the relationship between board characteristics and internal control.However, board behavior does not mediate the relationship between board members and internal control. Thus, it is suggested that board characteristics and internal control are directly linked. It is useful for directors to know that the characteristics of board members do make a difference.

Keywords: Individual Characteristics; Board Members; Internal Control Weaknesses; China

1. Introduction

This research investigates whether the characteristics of individual board members are associated with internal control problems[1]. The first internal control regulation in China, sometimes[2] called a Chinese version of the Sarbanes-Oxley Act of 2002 (henceforth "China SOX"), was enacted in July 2008. China SOX, a regulation adopted to enhance risk management and to prevent business disasters, became effective on January 1, 2012. This regulation requires Chinese listed firms and their auditors to evaluate the effectiveness of their internal controls and to provide opinions on internal controls in their annual reports (China SOX, p1). In particular, China SOX requires that boards of directors in China accept primary responsibility for the establishment and implementation of internal control (China SOX, p1). This requirement differs from the situations covered by US SOX[3], demonstrating that, in China, the board of directors plays an important role in internal control.

In addition, Chinese corporate governance has unique characteristics, and these characteristics have a substantial impact on internal control enforcement. First, the Chinese stock market prior to these reforms was characterized by weak legal enforcement and poor corporate governance (Chen & Chan, 2009). As an alternative mechanism, the key personnel in Chinese firms play key roles in the operation of enterprises. Second, the Chinese government greatly influences corporate governance (Chambers, 2005), and it attempts to improve internal control levels. State-owned

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[1] Internal control problems are defined as internal control weaknesses.
[2] China's Internal Control and Audit Regulatory Framework - http://www.china-briefing.com/news/2012/03/09/chinas-internal-control-and-audit-regulatory-framework.html#sthash.Q8RychAv.dpuf;
Opportunities to improve financial reporting and internal controls in China: CAS and C-SOX. http://www.pwc.com/gx/en/automotive/industry-publications-and-thought-leadership;
Wang, Liyan and Zhang, Jidong, What is the effect of China's SOX-Act? (November 1, 2009). http://ssrn.com/abstract=1542589
[3] According to US SOX, management is responsible for internal control effectiveness (SEC, 2002; Krishnan, 2005; Erickson et al., 2006).

firms and non-state-owned firms can differ in the effectiveness of their internal control. These new Chinese regulations and the country's institutional backgrounds offer an opportunity to conduct research: this research investigates how unique governance mechanisms, mixed with a socialistic market economy and state power, affect the internal control of Chinese firms, together with whether these reforms lead to improved governance for Chinese companies.

Internal control is "a process, implemented by an entity's board of directors, board of supervisors, management, and other personnel, with the aim of realizing control goals" (China SOX, p1). Individual characteristics include abilities, knowledge and skills (Hillman & Dalziel, 2003). This theoretical study supports the premise that particular features of the boards of directors are related to internal control (Hoitash et al., 2009) and management advice (Haynes & Hillman, 2010). When an organization's management and ownership are separated, an "agency problem" arises (Jensen & Meckling, 1976), in that the goals and desires of owners and managers are in conflict, and the shareholders cannot adequately monitor managerial work (Eisenhardt, 1989). The role of the boards of directors is to represent the interests of the owners and to protect the interests of the shareholders (Hart, 1993). The board plays a critical role in reducing the loss of proxy access (Dalton et al., 2007). Thus, in the areas of corporate governance and auditing, the influence of board characteristics is a vital issue.

However, relevant empirical results are scarce. Existing studies (Rice et al.,2014; Chen et al., 2015) have investigated the influence of corporate governance on internal control problems both before and after SOX Section 302 and SOX Section 404. The characteristics of boards of directors and management have been found to be correlated with the disclosure of internal control

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weaknesses (i.e., Krishnan, 2005; Zhang et al., 2007; Lin et al., 2014). However, this literature

(i.e., Krishnan, 2005; Srinivasan, 2005; Johnstone et al., 2011) has only examined some

characteristics of boards, for example, their independence, experience, expertise, turnover and

former audit partners. Furthermore, prior studies have not analyzed the mediating and moderating

effects of board behavior (independence and diligence) and ownership. Previous studies also have

not considered the individual role of the chairman.

2. Hypothesis development

Boards of directors and internal control

Hypothesis 1a.

The relationships of educational level with corporate governance and internal control have been

examined by previous research. Goll et al. (2008) found that managers with high educational

backgrounds have a better ability to manage complex environments and have stronger confidence,

study abilities and adaptation abilities. Slater and Dixon-Fowler (2010) identified that a Master of

Business Administration (MBA) education significantly improves the business quality of the

student, which benefits firm performance. Bhagat et al. (2010) provided evidence that the

educational background of a general manager can improve short-term firm performance, but it has

no effect on long-term firm performance. They found that educated managers have high-level

social network resources, and they can easily obtain professional guidance and aid. A high

educational level has a signal transmission function, which can attract more educated persons to

join firms, which in turn is beneficial to the development of internal control.

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In terms of the Chinese setting, Wang (2013) pointed out that the key personnel in Chinese private, small and medium enterprises have weaker educational backgrounds, compared to those in state-owned and large firms. The quality of the education of the former is low, and they do not know how to implement internal control. In contrast, board members in Chinese foreign-funded enterprises have a comparably high educational level and internal control effectiveness is high. Chen and Li (2005) found that accounting information quality has a significant, negative correlation with the level of education of the chairman. If the degree of education of managers is higher, then the possibility of fraud is lower, and the quality of accounting information is higher. Furthermore, Lu (2012) examined the relationship between the educational background of the chairman and internal control efficiency in China. The findings showed that degree of education is positively correlated with internal control efficiency, leading to our first hypothesis.

H1a：*The educational level of board members is positive in diminishing internal control weaknesses.*

Hypothesis 1b.

Past work has provided mixed evidence for the impact of experience on internal control. For example, Krishnan (2005) found that the past working experience of the controller is closely linked to internal control problems. Naiker and Sharma (2009) found that the experience of members of the audit committee contributes to effective internal control. Hoitash et al. (2009) noted that fewer audit committee members with supervisory and accounting experience and the delegating of financial experts without accounting experience or multiple financial experts as audit committee members are related to material weaknesses. They also found that Section 404 material

weakness disclosure is related to more audit committee members having accounting experience. In addition, the nature of material weakness varies with experience types.

On the other hand, Prawitt et al. (2009), Lin et al. (2011) and Pizzini et al. (2011) included the experience of the internal auditor to evaluate the function of internal audits. However, they did not find significant results between the experience of internal auditors and the incidence of earnings management or material weaknesses. Johnstone et al. (2011) argued that the work experience of a CFO benefits weakness remediation. Following prior studies, we investigate whether the accounting experience of the boards of directors can effectively mitigate the incidence of internal control weaknesses. Thus, we posit the following hypothesis.

H1b: The accounting experience of board members is positive in diminishing internal control weaknesses.

Hypothesis 1c.

A large body of literature has provided evidence that financial expertise is useful for internal control. For example, Krishnan (2005) examined whether audit committee quality influences internal control and found that audit committees with accounting expertise are associated with fewer internal control problems. Zhang et al. (2007) presented evidence that the disclosure of material weakness is positively associated with poorer audit committee financial expertise and is especially linked with poorer accounting and non-accounting financial expertise. Naiker and Sharma (2009) found that the expertise possessed by former partners offers significant contributions to effective internal controls. In particular, Hoitash et al. (2009) provided evidence

that only accounting financial experts are related to the disclosure of account-specific control problems, while only supervisory financial experts are related to the disclosure of management-oriented issues to personnel and information technology. Both supervisory and accounting expertise are correlated with high-level internal control, while "user" financial experts are linked to material weakness disclosure.

In terms of weakness remediation, Li et al. (2010) examined the interrelationships between the qualification of the CFO and weakness remediation. They found that qualified CFOs are not likely to be related to receiving adverse SOX 404 opinions, and a qualified CFO is required to improve opinions. Johnstone et al. (2011) further evaluated whether the financial expertise on boards would improve weakness remediation. The results showed that the accounting expertise of the CFO benefits weakness remediation. If more board members have accounting certifications, such as CA or CIA, internal control quality in this firm should be better. Consequently, the relevant hypothesis is as follows.

H1c: The accounting certification of board members is positive in diminishing internal control weaknesses.

Hypothesis 1d.

Ethical intentions and actions are positively related. PricewaterhouseCoopers (2006), for example, reported that 25% of frauds are committed by top managers. Treviño and Youngblood (1990) and Hunt and Vasquez-Parraga (1993) suggested that ethical judgments are positively related to the intention to intervene. Management integrity is a major determinant of control effectiveness

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(Krishnan, 2005). Krishnan (2005) examined the association between internal control and auditing committee quality. She found that management's tendency to engage in fraud, auditor tenure and financial stress is consistently associated with internal control weaknesses. Skaife et al. (2013) studied the relationship between ineffective internal control and insider trading, and they observed that top managers were lacking in integrity in firms that disclosed material weaknesses.

The moral quality of some directors in China is comparatively poor. The number of management who have been penalized by the Stock Exchanges or China Securities Regulatory Commission was 8 in 2007, 5 in 2008, 8 in 2009, 5 in 2010, 10 in 2011, 27 in 2012, 29 in 2013, 36 in 2014 and 20 in 2015. On the whole, the number of executive violations is increasing year by year (Jiang and Zhao, 2017) .These have been known to abuse power, and break the law, damaging the efficiency of internal control. Yu (2009) considered that philosophy of management, leadership styles, ethics, values and the effectiveness of human resources have significant, positive correlations. Cheng and Wang (2008) tested the determinants of effective internal control and found that the integrity, ethics and values of managers and the degree of attention of managers paid to the competence of employees are positively related to internal control effectiveness in China. Similarly, based on legal, reporting and operating goals, Zhang and Zheng (2010) found that the integrity, ethics, and values of managers are the determinants of internal control effectiveness. As such, we hypothesize that moral board members are less likely to be related to internal control problems. In contrast, board members who have been penalized by Stock Exchanges or China Securities Regulatory Commission due to individual violation are considered to be more likely to be correlated with more internal control weaknesses.

H1d: The integrity of board members is positive in diminishing internal control weaknesses.

Hypothesis 1e.

Prawitt et al. (2009) included the amount of time spent on training during the year as a proxy for the quality of internal audits. They found that greater professional training of internal auditors can effectively reduce the incidence of earnings management. Based on the above analysis, we hypothesize that internal control training of boards leads to fewer internal control weaknesses.

H1e: The internal control training of board members is positive in diminishing internal control weaknesses.

Board chairman and internal control

In China, internal control is a "boss" project. The entrepreneur is the key to deciding whether a company establishes a sound internal control system or not. The higher ranks of a company bear responsibility for the planning and control of enterprise operations. The chairman is the head of the internal control team and is responsible for the construction of the internal control system (China SOX, p1). The board chairman recognizes the responsibility for internal control, strengthens the establishment and implementation of the guidance and supervision of internal control, and evaluates the effectiveness of internal control in an annual internal control report. In fact, the final controller and the top executive of internal control systems in Chinese firms is the board chairman. The board chairman, as the ultimate practitioner of the enterprise system arrangements, is the determinant of whether control mechanisms exert their effects (Gupta & Govindarajan, 1986; Michel & Hambrick, 1992). The person most responsible for internal control

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in Chinese enterprises is the board chairman (Chen & Wang 2014), who is at the core of the internal control framework and has the greatest influence on the center of power (Dalton & Kesner, 1985). He or she commands and controls an enterprise to achieve its goals. The people with the power in the company are responsible for internal control, which can break through the mechanical division between corporate governance and internal control.

In terms of the relationship between the board chairman and internal control, relevant research has been limited. Most investigations have been purely theoretical studies, and the evidence has been sparse in this area. Sandberg and Hofer (1988) acknowledged that the variables at the individual level of chairman lead to the success of the business. Hambrick and Mason (1984) found a negative correlation between the lead director and abnormal accruals, but insider power is significantly positively associated with accounting information quality.

Regarding Chinese research, Wan and Qu (2012) investigated the impact of the personal characteristics of board chairs on the voluntary disclosure of revenue plans. They found that firms with older chairmen and female chairs are more likely to disclose revenue plans voluntarily. Chen and Wang (2014) examined the association between board chair characteristics and internal control. The results showed that older, longer tenured, high salaried, and highly educated board chairmen were correlate with good internal control quality.

There have been several recent cases in which the characteristics of a company chairman appeared to have been relevant to corporate governance. The chairman of Chinese Aviation Oil in Singapore failed to pay sufficient attention to risk control and had no idea about risk management and internal control, so the internal control system that the company spent heavily to build was

ineffective. Board chairs should be aware of the important role of internal control maintaining stability and sustaining development. It is only when the chairman of the board knows the importance of internal control that he or she pays more attention to internal control, as well as takes the initiative to improve internal control efficiency, which is a professional quality that modern leaders must have. The demographic characteristics of chairmen influence the behavior (Tsui & O'Reilly, 1989; Boone et al., 2007) and the function of internal control mechanisms; their personal characteristics are essential to achieving internal control goals. As key personnel, the individual characteristics of Chinese chairman may play an invaluable role in internal control (Firth et al., 2006). Thus, given the unique role of Chinese board chairmen in internal control, we expect that the individual characteristics of board chairmen are closely related to internal control, and a hypothesis follows.

H2: The individual characteristics of board chairmen are related to internal control weaknesses.

The moderating impact of the nature of the dominant shareholder

In contrast to the US, China as an emerging market provides a research opportunity regarding the influence of external governance environment on internal control. In the Chinese stock market, more than half of listed firms are state-owned enterprises. The operation of listed firms is influenced by the incentives of the government. Listed firms bear the responsibility for many tasks such as solving employment issues, economic development, social stability and taxation. Recently, the Chinese government attempted to control the risk of company development by improving the quality of internal control. The external environment influences internal control quality (Chen &

Wang, 2014). Since dominant shareholder nature influences both boards of directors and internal control, we hypothesize that dominant shareholder nature influences the relationship between the board and internal control.

H3: The nature of the dominant shareholder affects the relationship between board member characteristics and internal control weaknesses.

The mediating impact of board behavior

Extensive research has been devoted to independent directors. Beasley (1996) and Abbott et al. (2000) found that firms with more independent audit committees are negatively correlated with fraud, misleading financial statements and abnormal accruals. Similarly, Abbott et al. (2004) argued that the independence of the audit committee is not likely to be correlated with restatements. Furthermore, Krishnan (2005) tested the correlation between internal control quality and audit committee quality. She found that independent audit committees can reduce the occurrence of internal control weaknesses. Goh (2009) collected data to conduct an empirical analysis of whether the effectiveness of governance mechanisms influences weakness remediation. He concluded that the proportion of independent boards can remediate weaknesses over time.

In terms of China, Cai (2007) found that more independent directors are correlated with better operation. Yang et al. (2009) found that an independent board of directors reduces the incidence of earnings management. Hu et al. (2010) reported that a high percentage of independent directors can improve the quality of accounting information. Cheng and Wang (2008) investigated the influence of corporate governance structure on the effectiveness of internal control. They found

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that attendance at annual shareholders meeting is positively related to internal control effectiveness. In particular, Zheng (2009) examined the interaction effects among independent director systems and other governance institutions. They found that the independent director system indirectly plays a role in corporate governance and significantly improves the effectiveness of large shareholder monitoring and management compensation incentives.

The system of independent directors is beneficial to corporate social responsibility without the greater cost of external regulation (Brudney, 1982). Independent directors have independence outside of the firm and thus can effectively monitor the operations of firms and ensure that internal control is effective. Therefore, this study expects that board independence has an influence on the association between internal control and board characteristics.

To our best knowledge, only limited relevant studies have investigated how the boards of directors influence internal control. The board characteristics influence board behavior, and then the behavior of the board affects internal control. Thus, our final hypothesis is that board behavior has a mediating influence on the relationship between the board and internal control.

H4: Board behavior influences the relationship between individual characteristics and internal control weaknesses.

Following Krishnan (2005), Prawitt et al. (2009) and Lin et al. (2011), this study adopts education, training, experience, certification and integrity as individual characteristics. To answer the research question, the study first considers the impact of the education, training, experience, certification and integrity of board members on internal control quality and weakness remediation.

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Given the vital role of the board chair in internal control, we also study the relationship between

the individual characteristics of the board chairmen and internal control problems. This study also

explores the effects of the nature of dominant shareholders and board behavior on the relationship

between board characteristics and internal control problems.

3. Research design

In this research, the data come from multiple sources. The data on internal control were

electronically collected from the China Internal Control Database [4]

(http://www.ic-erm.com/pro2.html). The data on education, experience, certification, integrity,

dominant shareholder nature, board meetings and independence were available from the China

Stock Market Accounting Research (CSMAR) Database (http://csmar.gtadata.com). The data on

training and internal control team were collected from annual reports by hand. We read through

each of the annual reports and searched key words. Reports are available from the websites of the

Shenzhen and Shanghai Stock Exchanges and the website of Juchao Information

(www.cninfo.com.cn). The other control variables are available from the CSMAR Database. If

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[4] The China Internal Control Database includes data about internal control assessment, internal control auditing, internal control deficiencies and internal control information disclosure index. It consists of six sub-databases: an internal control evaluation database, internal control auditing database, internal control evaluation weakness database, internal auditing weakness database, internal control information disclosure database and internal control index database. The data starts from 2007. It covers all listed companies in China. We obtained the data directly from the database (whether a firm disclosed control weaknesses and type). Deficiencies include design and operation deficiencies, financial reporting weaknesses and non-financial reporting weaknesses, control deficiencies, significant deficiencies and material weaknesses. Compared to other resources, this database is considered to be reliable.

The China Internal Control Database is the first and only database regarding internal control in China. It was developed by China Shenzhen DIB Company and supported by Sun Yat-sen University and the China Ministry of Finance. It provides access to functions of data searching, browsing, analyzing and exporting the internal control databases series to all subscribers. The mandatory disclosure of internal control weakness opens the door for empirical research regarding internal control in Chinese firms. Because internal control data became available to researchers, there has been a growing body of empirical research in internal control, studying the Chinese listed firms published in China's leading academic journals. For example, Lin and Rao (2009) took advantage of the internal control information provided by the internal control database and their studies found significant results. To ensure that this database is reliable, we also checked internal control self-assessment reports, internal control auditing reports, and the financial reports of some firms and it appeared that the internal control database is correct, complete and valid.

there were missing data, we manually searched for them from the Sina finance and economy

(http://finance.sina.com.cn/person/) and company website. If we still could not find relevant

information, we used Google and Baidu to search keywords (the name of company and directors).

We collected the data of the recent years before and after the implementation of China SOX from

2007 through 2015, which allowed us to consider the impact before and after China SOX came

into effect. The first year for which internal control data available is 2007 because Chinese firms

started to disclose internal control information in that year. The most recent year with available

data for this research is 2015. Our sample period is much longer than other works because we

tested nine full years, before and after China SOX. We selected sample firms from the main

boards of the Shenzhen Stock Exchange and the Shanghai Stock Exchange in China.

The sample selection steps are as follows. First, all firms that disclosed at least one internal control

weakness from 2007 to 2015 were identified in the China Internal Control Database. This

selection yielded an initial sample. Next, similar to other research (Jiang et al., 2010), we excluded

the financial and insurance industry[5], as well as cross-listed firms[6] (B shares and H shares),

because they are considered to have strong internal control and different regulation systems (Lin

& Rao, 2009; LaFond & You, 2010). After deleting financial and cross-listed observations and

eliminating missing data, there were 2187 observations. This sample consisted of Chinese listed

firms that disclosed internal control problems.

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[5] Internal control in the financial and insurance industry is more effective than in other any industry due to strict regulations (LaFond &You, 2010)

[6] Cross-listed firms face the same reporting environment as their foreign counterparts (Sun et al., 2011) and their internal control is heavily influenced by the enforcement, regulation and litigation environment of the country. The firms listed both domestically and abroad are considered to have better internal control (Accounting Department of the Ministry of Finance, China Securities Regulatory Commission, 2012). Cross-listed firms have a greater incentive to improve internal control.

With regard to the control sample, we employed a matched-pair design, which is a one-to-one matching approach. Each problem firm and non-problem firm were matched according to criteria based on industry, size (Ge & McVay, 2005) and ownership[7]. For each firm in the problem sample, a choice for the control sample was matched with a firm without problems using these three criteria. First, each problem firm was matched with a non-problem firm by industry. Ge and McVay (2005) and Fang et al. (2009) argued that internal control disclosure is different in certain industries. Second, each problem firm was matched with a non-problem firm by size. As mentioned elsewhere in this study, firm size influences internal control weaknesses. Finally, each problem firm was matched with a non-problem firm by ownership (state-owned enterprise or other). In Chinese listed firms, ownership has a great impact on internal control. This process resulted in a pool of 2187 matching firms.

4 Results

4.1 Comparison between firms with and without internal control problems

Table 1 shows the comparisons of means and medians between firms with and without internal control problems. In each panel, we present the mean and median values for both samples. Panel A presents the basic descriptive statistics for the dependent variable, which is the internal control index. According to Panel A, the matching sample has a higher internal control index (mean value =0.6457) than the initial samples (mean value =0.6178), indicating that the quality of internal control in the firms without internal control weaknesses is better than in their counterparts. This difference is significant.

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[7] We matched by size, industry and ownership so that we could then test whether differences in personal characteristics are associated with differences in internal control.

Panel B presents the comparison results of board characteristics. The results show that the variable for at least one board member with accounting experience is 20% in the matching sample, which is significantly higher than in the initial sample (12%). Non-problem firms have 11% board members with accounting certifications such as a CPA, which is higher than problem firms (8%), although the difference is only significant at the 5% level. The firms that disclosed internal control problems are less likely to have chairmen who have accounting qualifications.

Similar to Krishnan (2005), the matching sample has a larger number of directors with financial expertise. The firms without weaknesses have 7% board members who are trained, which is much higher than the firms with control weaknesses (6%) (significant at the 1% level). The average educational level of boards in matching firms is 3.5 (equivalent to between undergraduate and postgraduate), which is much higher than those in initial firms with a value of 3 (undergraduate level). Similarly, on average, the board members have more disciplinary actions in the initial sample than in the matching sample (the mean values are 0.0203 and 0.0053, respectively).

In summary, the mean values of all five individual characteristics of the board in the matching sample are significantly different from the initial sample, in the direction consistent with our hypotheses. We also create an index of characteristics that provides equal weighting to the individual characteristics, namely, experience, certification, training and education. The mean characteristic of problem firms is 0.9016 while the value is 1.0882 in non-control problem firms, indicating that board members with better characteristics are less likely to be attached to firms with internal control weaknesses.

Regarding chairmen, as seen in Panel C, the mean for experience in the matching samples is 8.9% and that for the initial sample is 6.6%. The percentage of board chairmen with professional certification is 0.044(0.043 for the initial sample), and 14% (12% for initial sample) of chairs have been trained in the non-problem firms. On average, the educational level of the matching samples is 3.47, which is higher than the initial sample with 3.45, although the difference is not significant. Additionally, board chairmen lack integrity in only 8.32% of matching samples, compared to 8.41% in problem firms. Thus, the results of experience, certification, training and integrity of chairs are in line with expectations, suggesting that, on average, board chairmen in non-weakness firms have more professional experience, certification, training, and integrity. In other characteristics, the average age of the chair in non-problem firms is slightly older than in problem firms (log value 3.9353 and 3.9274). Similarly, the mean values of chairmen compensation and stock holding in matching samples are 8.6822 and 4.8756, which are much larger than in the initial samples (7.7056 and 4.8234). The results are consistent with Ashbaugh-Skaife et al. (2007), who argued that a large number of stock options can cause a CEO to not want to disclose internal control weaknesses. The descriptive statistics suggest that the chairmen of non-problem firms are slightly older, have higher compensation and hold more stocks. However, the differences in education, gender and business are not significant between the two samples.

INSERT TABLE 1

4.2 Correlation matrix

Table 2 lists correlation analysis results between the independent variables employed in our regression analyses. It exhibits correlations among the independent variables employed in board

member samples. The table shows that all of the intercorrelation coefficients are less than 0.7, suggesting that multicollinearity is not a concern (Tabachnich & Fidell, 2001). We also checked the variance inflation factors (VIFs) of the independent variables, which are less than 2, indicating that multicollinearity is not a severe issue.

INSERT TABLE 2

4.3 Main multivariate regression analysis

4.3.1 Board members

Panel A of Table 3 evaluates hypothesis 1. The five individual characteristics measure the education, experience, certification, training and integrity of board members. The model is significant[8], as indicated by log likelihood and F values (-2089.82 (p<0.001) and 12.63). The pseudo R^2 and adjusted R^2 are 0.3107 and 0.0829, respectively.

Hypothesis 1a expects that the accounting experience of board members is related to internal control weaknesses. Consistent with this hypothesis, the results in Column 1 show that the experience data of board members are significantly negatively related to internal control weakness (p-value <0.01). This finding is consistent with Krishnan (2005), Naiker and Sharma (2009), Hoitash et al. (2009) and Johnstone et al. (2011).

Hypothesis 1b anticipates that the accounting certification of board members is related to internal control weaknesses. We find that the coefficient of certification is negative and significant, indicating that board members with more accounting certifications, such as CA and CIA, are

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[8] We conduct the regression by including characteristics separately, and the results still hold.

closely related to the incidence of internal control problems. This result is consistent with our hypothesis and the prior literature (Zhang et al., 2007; Hoitash et al., 2009; Naiker & Sharma, 2009), indicating that expertise on boards can detect material weaknesses.

For H1c, the result shows that education is significantly negatively related to internal control weakness disclosure. Mirroring Cooper and Slagmulder (2004) and Hartmann et al. (2008), this evidence indicates that having fewer educated board members leads to more internal control problems, consistent with our hypothesis and providing evidence to support the theory that formal education contributes to thoughtful decisions and creative solutions regarding the organization.

For H1d, we find that, as expected, the percentage of lack of integrity is significantly positively related to ICW, indicating that the firms that disclosed internal control deficiencies are more likely to have more board members who have had disciplinary actions taken against them. The result is consistent with Skaife et al. (2013), who noted the lack of integrity of top managers in firms with material weaknesses. This finding provides support for the requirements raised by SOX 404 requiring auditors to issue adverse internal control reports about unethical work environments.

H1e is that internal control training of board members is related to internal control problems. The results show that the coefficient on training is significant, which is consistent with the prior research findings of Krishnan (2005) and Ge and McVay (2005).

Combined, Table 3 Panel A suggests that individual characteristics, namely the experience, certification, education, integrity and training of board members, are significantly related to the likelihood of internal control problems. The results support Hypothesis 1.The experience and

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integrity of board members are also significantly related to internal control quality (internal control index/ICI). For control variables, independence, corporate governance (non-duality and management's characteristics), firm characteristics (firm size) and financial condition are significantly related to internal control weaknesses.

INSERT TABLE 3

4.3.2 Board chairmen

Table 3 Panel B shows that the accounting experience of chairmen is moderately, significantly and negatively related to internal control weaknesses. The coefficients of integrity and accounting experience of chairs are also significant when the dependent variable is the internal control index. Among other characteristics, compensation has a significant coefficient, suggesting that the compensation of chairmen exercises a strong influence on internal control quality, consistent with Hoitash et al. (2009). However, the coefficient of gender is positive, which is contrary to Ahern and Dittmai (2012) and Giannetti et al. (2013). This difference could exist because the majority of board chairmen are men in our sample.The results in Panel B suggest that individual characteristics of board chairmen are related to internal control weaknesses. Thus, our second hypothesis is supported suggesting that Chinese chairmen play a vital role in internal control. In summary, the results in Table 3 support the first hypothesis for board members and Hypothesis 2 for chairmen. The results confirm that individual characteristics including the education, experience, certification, integrity and training of board members, have strong relationships with whether the firm discloses internal control weaknesses. The characteristics of chairmen are also significantly associated with internal control. China SOX requires boards of directors to accept the

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full responsibility and managers to take charge of internal control. The results of the full samples demonstrate that Chinese internal control regulations are appropriate because both board members and top management have great influence on internal control. It is necessary for Chinese firms to raise the quality of board members and for top management to have a high-quality internal control system.

4.3.3 Dominant shareholder nature

Table 4 reports that the coefficient on the combined index of characteristics is significant and negative, indicating that the individual characteristics of board members are strongly related to internal control weakness disclosure. The coefficient on the testing variable characteristics*owner is significant, indicating that the dominant shareholder nature has a moderating effect on the relationship between internal control and board characteristics. The ownership itself also has a strong relationship with the disclosure behavior of internal control in Chinese firms. This result suggests there is a significant difference between state-owned firms and non-state -owned firms in whether they disclose internal control weaknesses and in the relationship between board characteristics and internal control. The results indicate that the relationship between board characteristics and internal control is more significant in non-state-owned firms than in state-owned firms. This result is consistent with Lu (2012), who argued that, compared to state-owned firms, board members in non-state owned firms have greater influences on internal control. Therefore, board characteristics in non-state-owned firms have more significant relationships with internal control weaknesses. Hence, we can conclude that Hypothesis 3 is accepted.

INSERT TABLE 4

4.3.4 Board behavior

Panel A of Table 5 reports the results of the mediating effect of board diligence measured by the number of board meetings. The results show that in both models with and without board meetings, the coefficients on board members' characteristics are significant. A relationship between board characteristics and control problems is expected to be insignificant when we include meetings in the model. We anticipate that the characteristics affect board diligence, and then diligence influences control weaknesses. However, the significance of board characteristics remains. The results indicate that board diligence does not influence the relationship between the board and internal control. As is shown in Table 5, the frequency of board meetings does not affect internal control weaknesses.

Panel B reports the results of the influence of independence on the relationship between internal control weaknesses and board characteristics. The results show that the coefficients on the characteristics of board members remain significant after we add independence to the model. This finding indicates that independence does not influence the relationship between internal control weakness and the characteristics of board members, leading us to reject Hypothesis 4. However, the coefficient on independence is negatively and significantly related to internal control problems, indicating that a board composed of more independent directors is more effective in reducing

internal control weaknesses[9]. This finding suggests that independent directors are effective in China.

In summary, the results in Table 5 show that the behavior of board members, including board diligence (frequency of board meetings) and independence, have no mediating effects on the relationship between board characteristics and internal control. This finding could occur because board characteristics have more direct influence on internal control. Thus, our last hypothesis is not confirmed.

INSERT TABLE 5

4.4 Additional analyses

4.4.1 Robustness test to address endogeneity

Endogeneity is always an issue in empirical papers (Heckman, 1979). It is the possibility that the dependent variable might influence the independent variables. It is a potential problem that could occur in the main model. We use two approaches to address this concern. First, the standard textbook solution to endogeneity is to implement some types of instrumental variables estimation procedure. Following Lin et al. (2014), we use two-stage least squares, instrumental variable (2SLS-IV) regressions to estimate the relation between board characteristics and internal control. We use two instrumental variables, including lagged board characteristics by one year and the median of board characteristics score by industry. Table 6 Panel A presents the results of this test.

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[9] We also run a different model including the existing variables, independence, and each of the existing variables multiplied by independence to determine whether independence influences the relationship between board characteristics and internal control. The results are the same.

When we control for endogeneity using the two-stage least-squares model, *characteristics* is significantly positively associated with the internal control index in both models. The results using these instrumental variables confirm the initial findings.

Second, the firms that disclosed internal control weaknesses might have been firms with low-quality board members. The choice of board members of a firm is exogenous. The presence of any self-selection can introduce bias to the regression model from the perspective of econometrics (Maddala, 1983). Following Srindhi et al. (2011), to account for selection bias, this study performs a regression based on the sample consisting of the firms that changed boards of directors. A total of 1209 firms changed at least one of their board members from 2007 to 2015 in my sample. The results in Panel B indicate that the coefficient on characteristics (education, experience, certification and lack of integrity) remain significant in the model, suggesting that with an increase in board member quality, these firms have fewer internal control problems. This finding indicates that the results have not been affected by endogeneity.

Overall, we employ two-stage regressions and changing text in the sensitivity analysis to address endogeneity and self-selection issues. All of the results remain qualitatively similar to the findings reported in the original samples, indicating that endogeneity is not likely to be a significant problem in this study. However, we acknowledge that this issue cannot be completely ruled out. We leave a more thorough examination to future research.

INSERT TABLE 6

4.4.2 The impact of fixed effects at the firm-level

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We control for potential cross-relations within firms by reporting the results after controlling for fixed effects at the firm-level. Table 7 shows that education, certification and experience are significantly negatively related to internal control weaknesses. Lack of integrity has a strong positive relationship with control weaknesses, suggesting that fixed effects at the firm-level do not influence the results. Additionally, it is difficult to control all of the variables at the firm level because it is impossible to control for all of the corporate governance variables and corporate characteristics, indicating that the results are robust.

INSERT TABLE 7

4.4.3 The impact of China SOX

We compare the difference before and after the implementation of China SOX. We assume that the firms have a greater incentive to improve internal control after the enactment of new regulations. The samples are divided into two subsamples before and after 2012 because, in 2012, China SOX had started to implement the mandatory disclosure requirements.

The regression analyses were re-run on these two groups: 2007-2011 and 2012-2015. These tests analyze the change in the main results when the implementation requirements of China SOX changes in 2012. Table 8 shows that the 2007-2011 sample firms provide a similar significant result to the 2012-2015 sub-samples. It can be seen that internal control weaknesses are influenced by the experience, integrity, certification and education of boards of directors, while in 2012-2015, experience, training, integrity and education are related to internal control weakness disclosures. Overall, the results are similar before and after the implementation of China SOX. The results

show that the characteristics of board members in Chinese listed firms are significantly related to internal control disclosure behavior before and after China SOX. The reason could be that board members do play a vital role in internal control no matter China SOX was issued or not. Another explanation could be the impact of China SOX implementation got adopted well since voluntary disclosure stage before it came into existence. This is interesting and would provide avenues for future research.

INSERT TABLE 8

4.4.4 Alternative measures

Finally, we re-run the regression with alternative measurements. Education is a dummy variable equal to 1 if the educational level is a Master's or a PhD, and 0 otherwise. Lack of integrity, as a dummy variable, equals 1 if at least one of the directors has a violation history. Certification is an indicator variable. If one director has an accounting certification, we assign a 1, and a 0 otherwise. We perform the same measurement for the characteristics of management. For independence, it equals 1 if the percentage of independent board members is greater than one-third and 0 otherwise.

Table 9 shows that the education, certification, experience and integrity of board members are significantly related to internal control weaknesses. This finding suggests that the relationships between internal control problems and board characteristics remain significant by alternative measurements of the variables. Our results are robust in this matter.

INSERT TABLE 9

5. Conclusion

In conclusion, this research examines the influences of board characteristics on specific internal control problems and weakness remediation before and after the enactment of China SOX. China's new regulations and unique setting provide a good research opportunity. Most American papers (e.g., Krishnan, 2005; Zhang et al., 2007; Lin et al., 2011) have studied the associations among audit committees, management and internal control. According to China SOX, the boards of directors accept the main responsibility for internal control. Therefore, we hypothesize that the education, training, experience, certification and integrity of board members are related to internal control weaknesses. We also expect that dominant shareholder nature and board behavior have an influence on the correlation between the board and internal control.

H1 (board member characteristics) and H2 (characteristics of chairmen) are supported to some extent. The findings suggest that the individual characteristics (education, experience, certification, integrity and training) of Chinese board members and board chairmen are related to internal control weaknesses and weakness remediation. Their relationships are direct and are not affected by board behavior but are influenced by ownership nature. The results provide strong evidence that board members play an invaluable role in Chinese internal control.

In light of the current debate on the quality of Chinese boards of directors and the effectiveness of China SOX, our findings provide market regulators and stakeholders in China and other countries with timely evidence regarding the likely outcomes of similar standards in their jurisdictions. Our study indicates that requiring boards of directors to accept responsibility for internal control with the help of the boards of supervisors and management could benefit internal control.

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This thesis offers several caveats to the above findings. First, the analysis is restricted to listed firms in China. Future research might further examine the hypotheses using data from non-listed firms when the data become available. In regard to the nature of ownership, we only consider state-owned firms and non-state firms. Following Jiang et al. (2010), future studies could further examine local government and central government and family and non-family firms to establish the differences between them in terms of internal control. Another concern is the possibility that our results are confounded by endogeneity. While it is difficult to completely eliminate this concern, the results from a two-stage-least-squares regression indicate that endogeneity is not likely to be a significant problem. Some unobserved factors relating to internal control might have influenced the reported results. For example, there are many monitors of internal control. To mitigate this issue, this study controls for top management and possible determinants identified in previous research (e.g., Doyle et al., 2007). However, other factors, including firm culture, the boards of supervisors, human capital, social capital and diverse characteristics of the boards of directors and managers, concentration of ownership, and the tradability of shares, should also be controlled for. These aspects are left for future research. Finally, it is difficult to say whether a firm has no internal control problems if it does not disclose internal control weaknesses. A firm that does not disclose internal control could have two explanations: one is it does not have internal control weaknesses, and the other is that it does not want to disclose when it has internal control problems. It is difficult to control for the incentives of whether the firms disclose or not, particularly in the Chinese setting. Some firms have internal control deficiencies but they do not discover or disclose them, which cannot be observed (Naiker & Sharma, 2009). In fact, the choice to disclose and the actual presence of weakness are two different things. This fact is a limitation of

our study. Despite these limitations, this research provides important original and explicatory findings on the relationship between board characteristics and internal control weaknesses in Chinese listed firms, based on the background of China SOX. More questions can be explored in further research in China and other countries with similar institutional backgrounds.

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Table 1

Comparison between firms with and without internal control problems

Panel A

Descriptive statistics on internal control index

Variable	Initial Sample					Predicted difference	Matching Sample				
	Mean	Median	Std. Dev.	25%	75%		Mean	Median	Std. Dev.	25%	75%
Internal control	0.6178	0.6516	0.1364	0.6339	0.6581	<	0.6457[a]	0.6527[a]	0.0689	0.6417	0.6592

Panel B

Descriptive statistics on characteristics of board members

Variable	Initial Sample					Predicted difference	Matching Sample				
	Mean	Median	Std. Dev.	25%	75%		Mean	Median	Std. Dev.	25%	75%
Experience	0.1221	0	0.3275	0	0	<	0.2007[a]	0[a]	0.4003	0	0
Certification	0.0776	0	0.1611	0	0.11	<	0.1081[b]	0.09[a]	0.1362	0	0.17
Training	0.0553	0	0.2287	0	0	<	0.0709[a]	0[s]	0.2567	0	0
Education	3.2134	3.11	0.5377	3	3.6	<	3.5426[a]	3.56[a]	0.5832	3	4
Lack of integrity	0.0203	0	0.1033	0	0	>	0.0053[a]	0[a]	0.0527	0	0
Characteristics	0.9016	0.72	0.4657	0.6	0.902	<	1.0882[a]	0.882[a]	0.5414	0.72	1.4

Panel C

Descriptive statistics on characteristics of board chairmen

Variable	Initial Sample					Predicted difference	Matching Sample				
	Mean	Median	Std. Dev.	25%	75%		Mean	Median	Std. Dev.	25%	75%
Experience	0.0658	0	0.2481	0	0	<	0.0887[a]	0[a]	0.2844	0	0
Certification	0.0430	0	0.2029	0	0	<	0.0444[a]	0[a]	0.2059	0	0
Training	0.1152	0	0.193	0	0	<	0.1381[a]	0[a]	0.3451	0	0
Education	3.4472	4	0.8444	3	4	<	3.4737	4	0.8391	3	4
Lack of integrity	0.0841	0	0.2777	0	0	>	0.0832[a]	0[a]	0.2763	0	0
Ln(Age)	3.9274	3.9318	0.1398	3.8502	4.0254	<	3.9353[a]	3.9318[a]	0.1421	3.8501	4.0431
Gender	0.7590	1	0.4278	1	1	>	0.7462	1	0.4353	0	1
Ln(Compensation)	7.7056	7.7056	11.6952	0	13.0085	<	8.6822[a]	12.2215[a]	5.9934	0	13.1224
Ln(Stockholdings)	4.8234	0	6.9318	0	11.0241	<	4.8756	0[a]	6.9676	0	10.9383
Business	0.7875	1	0.4084	1	1	>	0.7797[b]	1	0.4058	1	1

The t-test of means use the pooled method when the underlying variances are equal and the Satterthwaite method when they are unequal.

a, b, or c significantly different from Material Weakness group at a one-tailed p-value 0.01, 0.05, or 0.10, respectively, under a t-test (shown on mean value above) or Wilcoxon rank-sum test (shown on median value above).

Table 2: Correlations between variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1.Education	1.000	**0.112**	0.010	**-0.052**	**0.051**	-0.001	0.070	0.026	**0.010**	**0.081**	0.074	-0.068	0.025	0.004	0.027	0.072	0.027	-0.010	**0.047**	-0.001	**0.043**	0.012
2.Certification	**0.112**	1.000	**0.065**	-0.016	**0.039**	**-0.019**	**-0.003**	0.000	**0.005**	0.042	**0.051**	**-0.011**	-0.002	-0.005	0.006	0.041	-0.028	-0.002	0.019	0.002	**0.047**	0.003
3.Experience	0.010	**0.065**	1.000	-0.018	**0.083**	**-0.074**	0.018	**0.002**	**0.041**	-0.004	**0.045**	-0.031	**-0.031**	0.008	**0.065**	**0.028**	-0.015	-0.006	-0.002	-0.007	0.007	**-0.054**
4.Lack of integrity	**-0.052**	-0.016	-0.018	1.000	0.005	**-0.045**	0.021	0.021	0.031	**0.014**	**-0.044**	-0.031	0.013	-0.005	**-0.060**	**-0.035**	-0.024	**0.211**	-0.007	-0.002	-0.010	0.003
5.Training	**0.051**	**0.039**	**0.083**	0.005	1.000	**-0.032**	-0.005	-0.001	0.004	0.016	**-0.026**	-0.002	**-0.028**	-0.009	0.001	0.024	-0.022	-0.004	**0.110**	-0.004	0.008	-0.003
6.Ownership	-0.001	**-0.019**	**-0.074**	**-0.045**	**-0.032**	1.000	-0.051	-0.042	**-0.206**	0.088	0.094	0.171	-0.044	-0.004	**-0.037**	0.007	0.049	**-0.040**	0.006	-0.017	**0.005**	**0.020**
7.Independence	0.070	**-0.003**	0.018	**0.021**	-0.005	-0.051	1.000	**0.054**	0.045	**0.057**	0.122	-0.028	0.042	-0.006	0.031	0.123	**0.020**	0.033	0.002	**0.042**	0.037	-0.019
8.Meeting	0.026	0.000	**0.002**	0.021	-0.001	-0.042	**0.054**	1.000	**0.044**	0.082	**0.206**	**0.052**	**0.146**	**0.025**	0.002	**0.195**	0.036	0.006	0.008	-0.016	**0.019**	0.005
9.Nonduality	**0.010**	**0.005**	**0.041**	0.031	0.004	**-0.206**	0.045	**0.044**	1.000	**0.038**	**0.160**	**-0.256**	0.043	**-0.016**	0.006	0.142	0.001	0.031	**-0.047**	-0.010	**-0.012**	**-0.025**
10.Firmage	**0.081**	0.042	-0.004	**0.014**	0.016	**0.088**	**0.057**	**0.082**	**0.038**	1.000	**0.123**	**-0.013**	0.050	0.040	**-0.025**	0.125	0.000	0.012	0.015	**-0.026**	-0.015	0.006
11.Size	0.074	**0.051**	**0.045**	**-0.044**	**-0.026**	**0.094**	0.122	**0.206**	**0.160**	**0.123**	1.000	**-0.026**	0.056	**-0.016**	**0.150**	**0.642**	**0.156**	0.034	0.048	-0.006	0.047	**-0.009**
12.Leverage	-0.068	**-0.011**	-0.031	-0.031	-0.002	**0.171**	-0.028	**0.052**	**-0.256**	**-0.013**	**-0.026**	1.000	-0.021	-0.002	**-0.100**	**-0.036**	0.010	-0.036	**-0.044**	-0.014	**-0.029**	0.002
13.Restructure	0.025	-0.002	**-0.031**	0.013	**-0.028**	-0.044	0.042	**0.146**	0.043	0.050	0.056	-0.021	1.000	0.017	-0.002	0.076	-0.002	**-0.024**	0.025	**-0.024**	0.002	**0.032**
14.Growth	0.004	-0.005	0.008	-0.005	-0.009	-0.004	-0.006	**0.025**	**-0.016**	0.040	**-0.016**	-0.002	0.017	1.000	0.013	-0.009	-0.006	-0.003	-0.008	-0.001	-0.013	-0.024
15.Financial health	0.027	0.006	**0.065**	**-0.060**	0.001	**-0.037**	0.031	0.002	0.006	**-0.025**	**0.150**	**-0.100**	-0.002	0.013	1.000	**0.087**	0.022	0.009	0.027	0.005	0.000	0.012
16.Audit fee	0.072	0.041	**0.028**	**-0.035**	0.024	**0.007**	0.123	**0.195**	0.142	0.125	**0.642**	**-0.036**	0.076	-0.009	**0.087**	1.000	**0.300**	0.038	**0.002**	-0.008	0.004	0.008
17.Big 4	0.027	-0.028	-0.015	-0.024	-0.022	**0.049**	**0.020**	**0.036**	0.001	0.000	**0.156**	0.010	-0.002	-0.006	0.022	**0.300**	1.000	0.000	0.008	-0.003	-0.004	0.024
18.lack of integrity-m	-0.010	-0.002	-0.006	**0.211**	-0.004	**-0.040**	0.033	0.006	0.031	0.012	0.034	-0.036	**-0.024**	-0.003	0.009	**0.038**	0.000	1.000	0.024	-0.001	0.010	**-0.024**
19.Training-m	**0.047**	0.019	-0.002	-0.007	**0.110**	0.006	0.002	0.008	**-0.047**	0.015	0.048	**-0.044**	0.025	-0.008	0.027	**0.002**	0.008	0.024	1.000	**0.038**	**0.129**	**0.042**
20.Education-m	-0.001	0.002	-0.007	-0.002	-0.004	-0.017	**0.042**	-0.016	-0.010	**-0.026**	-0.006	-0.014	**-0.024**	-0.001	0.005	-0.008	-0.003	-0.001	**0.038**	1.000	-0.008	0.017
21.Certification-m	**0.043**	**0.047**	0.007	-0.010	0.008	**0.005**	0.037	**0.019**	**-0.012**	-0.015	0.047	**-0.029**	0.002	-0.013	0.000	0.004	-0.004	0.010	**0.129**	-0.008	1.000	**-0.028**
22.Experience-m	0.012	0.003	**-0.054**	0.003	-0.003	**0.020**	-0.019	0.005	**-0.025**	0.006	**-0.009**	0.002	**0.032**	-0.024	0.012	0.008	0.024	**-0.024**	**0.042**	0.017	**-0.028**	1.000

Table 2 reports the correlation coefficient between the independent variables. Spearman correlations are presented above the diagonal. Pearson correlations are presented below the diagonal. A correlation coefficient in bold indicates that correlation is statistically significant at the 10 percent level or better.

Table 3
Regression models of internal control weakness on explanatory variables and control variable
Panel A
Board members

Variables	Sign	Coef.	Z	Sign	Coef.	T
	DV=ICW			DV=ICI		
Education	-	-1.0035	-13.97***	+	-0.0027	-0.96
Certification	-	-1.6617	-6.41***	+	-0.0168	-1.53
Experience	-	-0.7593	-7.00***	+	0.0230	5.24***
Lack of integrity	+	2.5882	4.01***	-	-0.1301	-6.59***
Training	-	-0.2050	-1.24*	+	0.0100	1.52
Ownership	-	0.1492	1.76	+	-0.0032	-0.89
Independence	-	-2.5082	-4.80***	+	-0.0005	-0.02
Meeting	-	0.0948	0.84	+	0.0035	0.75
Non-duality	-	0.9747	9.68***	+	-0.0172	-4.30***
Firm age	+	0.0188	0.23	-	-0.0048	-1.36
Size	+	0.2764	6.56***	-	0.0087	5.10***
Leverage	+	-0.0388	-1.56	-	0.0008	0.76
Restructure	+	0.0952	1.07	-	0.0054	1.46
Growth	-	0.0013	0.38	+	-0.0003	-2.43**
Financial health	-	-0.3094	-2.51**	+	0.0429	8.35***
Audit fee	-	-0.0237	-0.28	+	-0.0054	-1.59
Big4	-	-0.0750	-0.33	+	0.0011	0.11
Lack of integrity-m	+	-0.3252	-1.73*	-	-0.0099	-1.15
Training-m	-	-0.5917	-5.08***	+	0.0067	1.43
Education-m	-	-5.9374	-22.85***	+	1.20e-07	0.60
Certification-m	-	-2.1377	-8.32***	+	0.0255	2.68***
Experience-m	-	-0.0242	-0.31	+	0.0037	1.15
Constant	?	17.3559	13.05***	?	0.4949	11.65***
Industry indicators	Included			Included		
Year indicators	Included			Included		
Observations	4374			4374		
Log likelihood/F	-2089.82			12.63		
Pseudo R²/Adj R²	0.3107			0.0829		

This table reports coefficients and *t/z*-statistics, ***, **, and * denote significance at the 1%, 5%, and 10% levels in a two-tailed test, respectively.

Panel B
Board chairmen

Variables	Sign	Coef.	Z	Sign	Coef.	T
		DV=ICW			DV=ICI	
Lack of integrity	+	-0.0632	-0.46	-	-0.0211	-3.65***
Education	-	-0.0275	-0.60	+	0.0012	0.62
Certification	-	0.0465	0.22	+	-0.0109	-1.26
Experience	-	-0.4233	-1.89*	+	0.0437	5.51***
Training	-	-0.1724	-1.41	+	-0.0042	-0.83
Age	-	-0.3366	-1.20	+	0.0130	1.13
Gender	-	0.3427	1.72*	+	0.0007	0.08
Compensation	-	-0.0359	-5.01***	+	-0.0003	-1.09
Stockholdings	-	-0.0008	-0.13	+	-0.0001	-0.32
Business	+	-0.0188	-0.19	-	0.0011	0.27
Ownership	-	0.0561	0.64	+	-0.0051	-1.39
Independence	-	-2.5817	-4.90***	+	-0.0056	-0.27
Meeting	-	0.0962	0.85	+	0.0040	0.85
Non-duality	-	0.9397	9.25***	+	-0.0165	-4.12***
Firm age	+	0.0138	0.17	-	-0.0052	-1.51
Size	+	0.2839	6.67***	-	0.0086	5.03***
Leverage	+	-0.0402	-1.60	-	0.0009	0.87
Restructure	+	0.1226	1.37	-	0.0042	1.15
Growth	-	0.0007	0.24	+	-0.0003	-2.35**
Financial health	-	-0.3107	-2.50**	+	0.0421	8.21***
Audit fee	-	-0.0465	-0.55	+	-0.0056	-1.65*
Big 4	-	-0.0181	-0.08	+	0.0012	0.13
Lack of integrity-m	+	-0.3417	-1.77*	-	-0.0096	-1.11
Training-m	-	-0.5497	-4.66***	+	0.0074	1.56
Education-m	-	-6.0229	-23.00***	+	0.0000	0.59
Certification-m	-	-2.12336	-8.25***	+	0.0219	2.30**
Experience-m	-	-0.0229287	-0.29	+	0.0033	1.02
Education-b	-	-1.0047	-13.93***	+	-0.0031	-1.10
Certification-b	-	-1.6145	-6.21***	+	-0.0200	-1.82*
Experience-b	-	-0.7578	-6.93***	+	0.0211	4.81***
Lack of integrity-b	+	2.6362	4.02***	-	-0.1247	-6.32***
Training-b	-	-0.1531	-0.92	+	0.0098	1.48
Constant	?	19.5582	11.52***	?	0.4547	7.48***
Industry indicators	Included			Included		
Year indicators	Included			Included		
Number of obs	4374			4374		
Log likelihood/F	-2068.8437			10.95		
Pseudo R^2/Adj R^2	0.3176			0.0910		

This table reports coefficients and *t/z*-statistics, ***, **, and * denote significance at the 1%, 5%, and 10% levels in a two-tailed test, respectively.

Table 4
Dominant shareholder nature (ownership)

Variables	Expected Sign	Coef.	Z
Characteristics	-	-0.7315	-6.76***
Characteristics*owner	-	-4235	-2.72***
Ownership	-	0.5311	3.14***
Independence	-	-2.5113	-4.94***
Meeting	-	0.1103	1.00
Non-duality	-	0.9663	9.91***
Firm age	+	-0.0004	-0.00
Size	+	0.2449	6.00***
Leverage	+	-0.0310	-1.29
Restructure	+	0.0688	0.80
Growth	-	0.0015	0.52
Financial health	-	-0.3230	-2.72***
Audit fee	-	0.0180	0.22
Big4	-	-0.1523	-0.68
Lack of integrity-m	+	-0.0573	-0.31
Training-m	-	-0.0573	-0.31
Education-m	-	-6.2265	-23.54***
Certification-m	-	-2.1856	-8.78***
Experience-m	-	-0.0069	-0.09
Constant	?	15.4973	11.94***
Industry indicators		Included	
Year indicators		Included	
Observations		4374	
Log likelihood		-2189.8847	
Pseudo R^2		0.2777	

This table reports coefficients and *z*-statistics, ***, **, and * denote significance at the 1%, 5%, and 10% levels in a two-tailed test, respectively.

Table 5
Board behavior
Panel A
Frequency of board meetings

Variables	Sign	Model 2-1-1 Coef.	Model 2-1-1 Z	Model 2-1-2 Coef.	Model 2-1-2 Z
Education	-	-1.0117	-14.14***	-1.0117	-14.14***
Certification	-	-1.6178	-6.28***	-1.6138	-6.26***
Experience	-	-0.7632	-7.05***	-0.7632	-7.05***
Lack of integrity	+	2.5155	3.90***	2.5062	3.89***
Training	-	-0.1981	-1.20	-0.1981	-1.20
Meeting	-			0.0741	0.66
Ownership	-	0.1546	1.84*	0.1596	1.89*
Non-duality	-	0.9755	9.70***	0.9764	9.71***
Firm age	+	0.0105	0.13	0.0079	0.10
Size	+	0.2696	6.47***	0.2666	6.36***
Leverage	+	-0.0382	-1.54	-0.0390	-1.57
Restructure	+	0.0949	1.08	0.0895	1.01
Growth	-	0.0013	0.42	0.0012	0.40
Financial health	-	-0.3028	-2.47**	-0.2025	-2.47**
Audit fee	-	-0.0247	-0.30	-0.0283	-0.34
Big4	-	-0.0656	-0.28	-0.0632	-0.27
Lack of integrity-m	+	-0.3467	-1.87*	-0.3452	-1.87
Training-m	-	-0.5860	-5.04***	-0.5873	-5.05***
Certification-m	-	-2.1365	-8.37***	-2.1363	-8.38***
Experience-m	-	-0.0161	-0.21	-0.0173	-0.22
Education-m	-	-5.9682	-22.90***	-5.9647	-22.89***
Constant	?	16.9743	12.83***	16.9309	12.78***
Industry indicators		Included		Included	
Year indicators		Included		Included	
Observations		4374		4374	
Log likelihood		-2101.593		-2101.3763	
Pseudo R^2		0.3068		0.3069	

This table reports coefficients and z-statistics, ***, **, and * denote significance at the 1%, 5%, and 10% levels in a two-tailed test, respectively.

Panel B
Independence

Variables	Sign	Model 2-2-1		Model 2-2-2	
		Coef.	Z	Coef.	Z
Education	-	-1.0117	-14.14***	-1.0035	-13.97***
Certification	-	-1.6178	-6.28***	-1.6661	-6.43***
Experience	-	-0.7632	-7.05***	-0.7594	-7.00***
Lack of integrity	+	2.5155	3.90***	2.5995	4.02***
Training	-	-0.1981	-1.20	-0.2049	-1.24
Independence	-			-2.4926	-4.77***
Ownership	-	0.1546	1.84*	0.1428	0.09
Non-duality	-	0.9755	9.70***	0.9736	9.67***
Firm age	+	0.0105	0.13	0.0221	0.27
Size	+	0.2696	6.47***	0.2802	6.69***
Leverage	+	-0.0382	-1.54	-0.0377	-1.52
Restructure	+	0.0949	1.08	0.1021	1.16
Growth	-	0.0013	0.42	0.0012	0.41
Financial health	-	-0.3028	-2.47**	-0.3099	-2.52**
Audit fee	-	-0.0247	-0.30	-0.0190	-0.23
Big4	-	-0.0656	-0.28	-0.0781	-0.34
Lack of integrity-m	+	-0.3467	-1.87*	-0.3271	-1.75*
Training-m	-	-0.5860	-5.04***	-0.5901	-5.07***
Certification-m	-	-2.1365	-8.37***	-2.1374	-8.31***
Experience-m	-	-0.0161	-0.21	-0.0225	-0.29
Education-m	-	-5.9682	-22.90***	-5.9416	-22.86***
Constant	?	16.9743	12.83***	17.4055	13.10***
Industry indicators		Included		Included	
Year indicators		Included		Included	
Observations		4374		4374	
Log likelihood		-2101.593		-2090.1724	
Pseudo R^2		0.3068		0.3106	

This table reports coefficients and *z*-statistics, ***, **, and * denote significance at the 1%, 5%, and 10% levels in a two-tailed test, respectively.

Table 6
Endogeneity tests
Panel A
Two-Stage least squares test[10]

		IV= Characteristics_lag		IV= Characteristics_ind	
Variables	Sign	Coef.	Z	Coef.	Z
Characteristics	+	0.0316	3.91 ***	0.1054**	2.34
Ownership	+	-0.0148	-2.60 ***	-0.0091	-1.33
Independence	+	0.0296	1.88*	0.0313	1.92 *
Meeting	+	-0.0026	-0.33	0.0002	0.02
Non-duality	+	0.0356	5.62***	0.0350	5.34 ***
Firm age	-	0.0292	5.19 ***	0.0261	4.27 ***
Size	-	0.0275	10.70***	0.0271	10.17 ***
Leverage	-	-0.0240	-14.66***	-0.0237	-13.97 ***
Restructure	-	0.0267	4.42 ***	0.0299	4.57***
Growth	+	-0.0006	-3.10 ***	-0.0006	-3.01 ***
Financial health	+	0.0305	3.53 ***	0.0254***	2.69
Audit fee	+	0.0095	1.80*	0.0058	0.99
Big4	+	-0.0226	-1.43	-0.0141	-0.83
Lack of integrity-m	-	-0.0207	-1.46	-0.0159	-1.06
Training-m	+	0.0447	5.70 ***	0.0376	4.11***
Education-m	+	4.70e-07	1.39	5.11e-07	1.46
Certification-m	+	-0.0407	-2.50**	-0.0468	-2.72 ***
Experience-m	+	0.0076	1.40	0.0102	1.75*
Constant	?	-0.1397	-2.40 **	0.1537	-2.53 **
Industry indicators		Included		Included	
Year indicators		Included		Included	
Observations		4374		4374	
Wald X^2		900.55***		834.90***	
R^2		0.1672		0.1111	

The table presents results for instrumental variable approach. Constant and year fixed effects are included in all the columns. ***, **, and * denote significance at the 1%, 5%, and 10% levels in a two-tailed test, respectively.

[10] The F-statistics of first stage results are193.66 and 9.76 respectively.

Panel B
The firms that changed board members

Variables	Sign	Coef.	Z
Education	-	-1.1420	-7.97***
Certification	-	-4.0292	-5.74***
Experience	-	-0.8859	-4.02***
Lack of integrity	+	2.3747	2.40**
Training	-	-0.0074	-0.02
Ownership	-	0.2550	1.53
Independence	-	-2.4619	-2.49**
Meeting	-	0.3507	1.52
Non-duality	-	0.5017	2.40**
Firm age	+	0.2605	1.38
Size	+	0.1085	1.35
Leverage	+	-0.0402	-0.90
Restructure	+	-0.1903	-1.07
Growth	-	0.0029	0.53
Financial health	-	-0.5551	-2.61***
Audit fee	-	0.1680	1.00
Big4	-	-0.1125	-0.27
Lack of integrity-m	+	-0.2497	-0.18
Training-m	-	-0.6353	-2.71***
Education-m	-	-6.2889	-10.76***
Certification-m	-	-2.5664	-4.68***
Experience-m	-	0.0218	0.14
Constant	?	22.6765	7.06***
Industry indicators		Included	
Year indicators		Included	
Observations		1209	
Log likelihood		-552.58214	
Pseudo R^2		0.3386	

This table reports coefficients and *z*-statistics, ***, **, and * denote significance at the 1%, 5%, and 10% levels in a two-tailed test, respectively.

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Table 7
The impact of fixed effects at the firm-level

Variables	Sign	Coef.	Z
Education	-	-1.0068	-15.72***
Certification	-	-0.7525	-3.16***
Experience	-	-0.7818	-8.12***
Lack of integrity	+	2.6503	4.56***
Training	-	0.0539	0.37
Ownership	-	0.0314	0.43
Independence	-	-1.9039	-4.17***
Meeting	-	0.1906	1.90*
Non-duality	-	0.7818	9.60****
Firm age	+	0.1480	2.04**
Size	+	0.2503	7.29***
Leverage	+	0.0112	0.52
Restructure	+	0.2301	2.99***
Growth	-	0.0018	0.67
Financial health	-	-0.3433	-3.10***
Audit fee	-	0.0645	0.90
Big4	-	-0.0084	-0.04
Integrity-m	+	-0.3159	-1.59
Training-m	-	-0.4890	-4.74***
Education-m	-	-0.9482	-13.56***
Certification-m	-	-2.2143	-9.16***
Experience-m	-	-0.0497	-0.72
Industry indicators	Included		
Year indicators	Included		
Observations	4374		
Log likelihood	-2513.9823		

Table 7 reports the results of the impact of fixed effects at the firm-level. This table reports coefficients and *z*-statistics, ***, **, and * denote significance at the 1%, 5%, and 10% levels in a two-tailed test, respectively.

Table 8
The impact of China SOX on models for different periods

Variables	Sign	Before (07-11) Coef.	Before (07-11) Z	After (12-15) Coef.	After (12-15) Z
Education	-	-1.3663	-12.94***	-0.8277	-7.45***
Certification	-	-4.3664	-7.79***	-0.4988	-1.62
Experience	-	-0.8874	-5.75***	-0.7066	-4.09***
Lack of integrity	+	4.2078	3.47***	1.3947	1.65*
Training	-	-0.0498	-0.18	-0.4844	-2.09**
Ownership	-	0.1298	1.08	0.2833	2.01**
Independence	-	-4.8059	-6.06***	-1.3522	-1.79*
Meeting	-	0.7990	4.89***	-0.1871	-1.09
Non-duality	-	0.3073	2.12**	1.6193	10.53***
Firm age	+	0.1957	1.69*	-0.5374	-3.75***
Size	+	0.1400	2.28**	0.5790	9.01***
Leverage	+	-0.0979	-3.01***	0.0106	0.23
Restructure	+	0.9487	7.48***	-0.0494	-0.36
Growth	-	-0.2095	-4.89***	0.0035	1.22
Financial health	-	-0.5984	-3.40***	-0.4605	-2.41**
Audit fee	-	-0.1728	-1.44	-0.3200	-2.49**
Big4	-	0.4556	1.27	0.0406	0.14
Lack of integrity-m	+	0.2293	0.18	-0.1022	-0.46
Training-m	-	-0.0884	-0.55	-1.3439	-7.09***
Education-m	-	-8.9761	-18.44***	-3.4071	-16.10***
Certification-m	-	-1.4928	-4.00***	-4.0553	-8.55***
Experience-m	-	0.1228	1.09	-0.3563	-3.02***
Constant	?	-3729.429	-17.75***	8.0635	4.53***
Industry indicators		Included		Included	
Year indicators		Included		Included	
Observations		2260		2114	
Log likelihood		-1005.971		-934.0812	
Pseudo R^2		0.3578		0.3625	

This table reports coefficients and *z*-statistics, ***, **, and * denote significance at the 1%, 5%, and 10% levels in a two-tailed test, respectively.

Table 9
Alternative measures

Variables	Sign	Coef.	Z
Education	-	-1.2351	-14.14***
Certification	-	-0.9190	-12.72***
Experience	-	-0.6680	-6.76***
Integrity	+	2.7387	4.69***
Training	-	0.0067	0.05
Ownership	-	0.0676	0.86
Independence	-	-0.4094	-5.59***
Meeting	-	0.1623	1.56
Non-duality	-	0.9510	10.28***
Firm age	+	0.0550	0.73
Size	+	0.3054	7.84***
Leverage	+	-0.0511	-2.14**
Restructure	+	0.2119	2.59***
Growth	-	0.0017	0.73
Financial health	-	-0.4225	-3.67***
Audit fee	-	-0.0677	-0.88
Big4	-	-0.0128	-0.06
Integrity-m	+	-0.3257	-1.79*
Training-m	-	-0.5000	-4.75***
Education-m	-	-3.7249	-13.58***
Certification-m	-	-0.8323	-10.79***
Experience-m	-	-0.0471	-0.66
Constant	?	-4.8598	-5.09***
Industry indicators		Included	
Year indicators		Included	
Observation		4374	
Pseudo R^2		0.2077	
Log likelihood		-2402.1588	

Table 9 reports the results of alternative measures. This table reports coefficients and *z*-statistics, ***, **, and * denote significance at the 1%, 5%, and 10% levels in a two-tailed test, respectively.

Appendix

Variable definitions

Variable	Descriptions
Depend variables	
ICI	The log of internal control index/10.
ICW	Equals to 1 of this firm disclosed internal control weaknesses or remediated internal control problems.
Independent variables	
<u>**Board's characteristics**</u>	
Education	1=high school and below; 2=college, 3=undergraduate, 4=postgraduate, 5= Ph.D.
Lack of integrity	Measured by the percentage of directors with disciplinary actions.
Training	1 if the board has internal control training in the current year, 0 otherwise.
Certification	The percentage of board members who have accounting certification.
Experience	1 if a board member is responsible for financial and accounting issues, 0 otherwise.
Characteristics	The characteristics index based on average weighting of education, certification, experience and training.
<u>**Chair's characteristics**</u>	
Education	1=high school and below; 2=college, 3=bachelor level, 4=master, 5= Ph.D.
Certification	1= the chair has accounting certification, 0 otherwise.
Experience	1 if a chair is responsible for financial and accounting issues, 0 otherwise.
Lack of integrity	1= the chair has individual history of disciplinary actions, 0 otherwise.
Training	1 the chairperson has internal control training in the current year, 0 otherwise.
Control variables	
<u>**Chair's characteristics**</u>	
Age	The log of the age of board chairmen.
Gender	1=if the chair is female, 0 otherwise.
Compensation	The log of salary of chairman.
Stockholdings	The log of the number of shares of chair.
Business	1=if the chair also works in other firms, 0 otherwise.
<u>**Corporate governance**</u>	
Non-duality	1=if the chairman and general manager are not the same person, 0 otherwise.
Independence	The percentage of independent directors
Meeting	The log of the numbers of board meetings in the last year.
<u>**Firm characteristics**</u>	
Firm age	The log of the number of years.
Firm size	Natural logarithm of total assets.
<u>**Ownership structure**</u>	
Ownership	1= state-owned firms, 0 otherwise.
<u>**Financial condition**</u>	
Financial health	If the firm reports a positive net profit, I assign one, and zero otherwise.
Growth	The growth rate of operating revenue.
Restructuring	1=restructuring this year, 0 otherwise.
Leverage	Debt/total assets.
<u>**Audit status**</u>	
Audit quality	Equal to 1 if company auditor is one of big 4 auditors, and 0 otherwise.
Audit effort	Natural logarithm of audit fee.

Management's characteristics	
Education-m	1=a manager is responsible for financial and accounting issues, 0 otherwise.
Lack of integrity-m	Measured by the percentage of managers with disciplinary actions.
Training-m	1 = at least one manager has internal control training in the current year, 0 otherwise.
Certification-m	The percentage of management who has accounting certification.
Experience-m	1= a manager is responsible for financial and accounting issues, 0 otherwise.
Others	
Industry and year	Dummies

Highlights

- The first study to examine the association between board characteristics and control weaknesses
- Focuses on Chinese issues
- Based on an emerging economy and a non-U.S. single-country