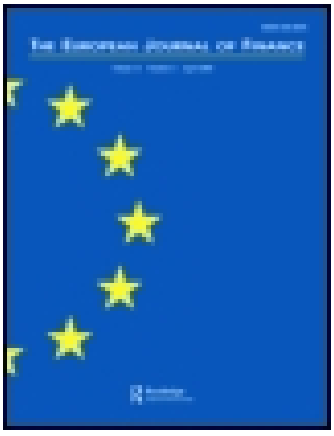

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Can independent directors improve internal control quality in China?

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Can independent directors improve internal control quality in China?

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This study conceptualises the monitoring power of independent directors (IDs) as consisting of specialist expertise or competence, incentives, balancing power and diligence. It then empirically investigates the influence of IDs' monitoring power on internal control quality (ICQ), which is proxied by the voluntary disclosure of auditors' reports on internal control and financial restatements released by China's A-share firms during 2006–2010. We find that the combined ID monitoring power index has a positive and significant effect on ICQ, which is robust to different proxies for ICQ, and that its components are also positively and significantly associated with either or (in most cases) both measures of ICQ. Overall, our evidence indicates that IDs' monitoring power plays a positive role in improving ICQ in China.

Keywords: corporate governance; independent directors; internal control quality; auditors' reports on internal control; financial restatement

JEL Classification: G18; G34; M41; M48

1. Introduction

Since the exposure of major corporate scandals such as those affecting Enron and WorldCom, securities regulators in many countries have paid close attention to how to establish an effective internal control system. For example, in July 2002, the US Congress enacted the Sarbanes–Oxley Act (SOX). Section 404 of the Act requires the managements of public firms to assess the effectiveness of their internal control and financial reporting procedures and to provide auditors' reports on the effectiveness of internal control. There is an abundance of empirical evidence demonstrating that effective internal control can enhance financial reporting quality (e.g. Doyle, Ge, and McVay 2007; Ashbaugh-Skaife et al. 2008).

In line with this recent international trend, China's regulators are hastening the construction of internal control systems in public firms. They have issued a series of rules and regulations since 2006. Along with the issuance of these regulations and the availability of related data, researchers in China are becoming increasingly interested in the factors that influence the effectiveness of internal control.

One strand of the internal control literature explores the effect of corporate governance on internal control quality (ICQ) (e.g. Bronson, Carcello, and Raghunanhan 2006; Doyle, Ge, and McVay 2007; Fang, Sun, and Jin 2009; Goh 2009; Owusu-Ansah and Ganguli 2010; Johnstone, Li, and Purley 2011). Corporate governance is a basic element of the control environment, which

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is the foundation of internal control. However, the literature focuses on the role of independent directors (IDs) in monitoring boards of directors (BoDs) and audit committees (e.g. Krishnan 2005; Zhang, Zhou, and Zhou 2007), and uses the proportion of IDs on boards and audit committees to measure their independence. Previous studies have found that other characteristics of IDs, such as educational background, work experience, diligence and reputation, have important effects on corporate performance in China (e.g. Tang, Du, and Shen 2010; Ye et al. 2011). However, no studies have tested whether these characteristics also affect ICQ. This study represents a first step towards addressing that issue.

In Western countries such as the UK, where corporate control and institutional investors perform a stronger monitoring function, IDs are less effective in carrying out monitoring functions (Guest 2009). In contrast, in China, external control mechanisms (e.g. investor protection, law and law enforcement, external auditors) are considered weak (Li et al. 2012). As a result, internal mechanisms are particularly important for effective corporate governance. IDs comprise such an internal mechanism. Under China's Company Law, a corporation is required to have both a BoD and a board of supervisors. The main functions of a board of supervisors are to review a company's financial reports; to monitor its directors and managers to ensure they are not violating the Company Law or Charter; and to require the company to correct behaviour that may harm shareholder interests. However, boards of supervisors in China are largely ineffective (Xiao, Dahya, and Lin 2004; Wu et al. 2013), which raises the expectations of the role of IDs in corporate governance and internal control.

Some recent studies provide evidence that IDs are effective in China. For example, IDs are found to increase bank performance and asset quality (Liang, Xu, and Jiraporn 2013), increase the accuracy of management forecasts (Song, Ji, and Lee 2013), perform oversight functions over executive board directors and senior management (Bo, Tao, and Sun 2013) and protect the interests of outside investors (Tang, Du, and Hou 2013). However, there is also evidence to suggest that they are ineffective. For example, Liu and Lu (2004) document that IDs find it difficult to vote against their executive director friends in China's *guanxi* culture. The existence of many highly publicised corporate scandals supports these observations (Chen, Hu, and Xiao 2010). Given the mixed evidence, there is scope for investigating the effectiveness of IDs in corporate governance. This study extends previous studies on IDs to the important issue of ICQ.

It is well known that many IDs in listed Chinese firms are academics and do not possess industry- and business-specific or specialist knowledge, which is essential for fulfilling their corporate governance roles (Li et al. 2012). For example, in the notorious Zhenzhou Baiwen case, a university English professor failed to perform his ID duties and was fined 100,000 yuan. The professor admitted to having no business knowledge, especially accounting knowledge (Chen, Hu, and Xiao 2010). Is such knowledge an important factor affecting the role an ID plays in internal control? We address this issue by exploring the relationship between the financial backgrounds of IDs and ICQ. Meanwhile, we observe that although IDs may receive compensation from the firms they serve, that compensation varies greatly, ranging from 2000 to 780,000 yuan per year in 2006. Further, the lowest paid IDs were significantly related to low attendance at meetings. This indicates that lowly paid IDs may lack the incentive to fulfil their monitoring roles. We investigate whether and to what extent IDs are incentivised to fill those roles.

The history of appointing IDs in Chinese firms is relatively short. The China Securities Regulatory Commission (CSRC) did not enact a formal, comprehensive guideline on IDs of domestically listed firms until 2001. The regulations stipulated that boards must have at least two IDs by 30 June 2002, and at least one-third of the board members should be IDs by 30 June 2003. One side effect of this compulsory requirement is that listed firms may simply

appoint IDs to comply with regulations (Chen and Al-Najja 2012). As a recent practice, IDs are also subjected to a learning process, but it is necessary to provide empirical evidence on whether increasing the proportion of IDs on a board can provide more balancing power to improve ICQ.

The corporate governance regulations require IDs to perform their duties diligently. There have been cases in which IDs have failed to do so, as in the aforementioned Zhenzhou Baiwen case. Our sample data show that although the IDs of some boards attended every board meeting, others attended only one-third. Can IDs fulfil their duties by performing their duties diligently? To answer this question, we examine the relationship between diligence and ICQ.

These observations highlight some interesting features of the IDs in listed Chinese firms. These features and the high expectations of the role of ID in corporate governance and internal control make it interesting and important to study whether IDs are truly effective and can fill their expected roles in maintaining and improving ICQ. In addition, these features both relate to and constitute IDs' monitoring power. Therefore, we construct an index of IDs' monitoring power from four dimensions: IDs' financial expertise, incentives, balancing power and diligence.

Our study empirically investigates the influence of IDs' monitoring power on ICQ as it relates to China's A-share firms. We use the voluntary disclosure of auditors' reports on internal control and financial restatements issued during 2006–2010 to proxy for ICQ. First, we examine the relation between the composite index of IDs' monitoring power and ICQ and find that the monitoring power index is positively and significantly associated with ICQ. We then examine the effect of the four dimensions of the monitoring power index on ICQ separately and find that they are related to either or (in most cases) both proxies of ICQ. In sum, this study provides empirical evidence for the positive role of IDs' monitoring power in improving ICQ.

This paper contributes to the literature in four ways. First, most studies use the proportion of IDs and financial experts on a board or audit committee as measures of the IDs' monitoring power (e.g. Krishnan 2005; Zhang, Zhou, and Zhou 2007; Fang, Sun, and Jin 2009; Goh 2009; Hoitash, Hoitash, and Bedard 2009; Johnstone, Li, and Purley 2011). This paper extends the findings of those studies by constructing and empirically testing a conceptual framework of IDs' monitoring power, consisting of the aforementioned four dimensions. The four dimensions interact with one another and combine to comprise IDs' monitoring power. We cannot achieve a full understanding of whether IDs can play their monitoring roles effectively if we consider only one or some of these dimensions. Our study represents a preliminary step towards formulating a multidimensional framework and thus enriches the theoretical literature on the role of IDs in internal control and corporate governance.

Second, this paper suggests a number of ways in which the roles of IDs in ICQ can be enhanced. For example, to improve ICQ, IDs on boards should be required to have financial expertise, low-paid IDs should be offered more compensation and some IDs should attend board meetings diligently. Meanwhile, great efforts should be made to strengthen the ID labour market and improve relevant regulations so that reputation constraints can be made effective.

Third, we identify and empirically confirm two measures that can be used to measure ICQ in a way that reflects the Chinese context: the disclosure of auditors' reports on internal control and the release of financial restatements. These proxies are more directly related to internal control compared with the traditional approach to creating an ICQ proxy by constructing an ICQ index. This study thus enriches the empirical research on ICQ.

Finally, this study provides new empirical evidence of IDs' positive role in improving ICQ based on an index of IDs' monitoring power. In addition, we offer new evidence on IDs' diligence in improving ICQ by observing whether IDs personally attend every board meeting. Because it

has long been difficult to observe the behaviour of IDs in terms of decision control, there is very limited relevant research.

The remainder of this paper is organised as follows. Section 2 provides the institutional background and a literature review. Section 3 outlines a theoretical framework of IDs' monitoring power and formulates our hypotheses. Section 4 describes the research design (including sample selection, model specification and variable measurement). Section 5 presents the empirical results. Section 6 provides robustness checks and Section 7 concludes the paper.

2. Institutional background and literature review

2.1 *Institutional background*

In recent years, internal control in China has attracted increasing attention from researchers, along with the increasing importance attached by China's regulators to the construction of an effective internal control system. In 2006, the Shanghai Stock Exchange (SSE) and Shenzhen Stock Exchange (SZSE) each issued the *Guidance on Internal Control of Public Firms*, suggesting that BoDs disclose their annual self-assessment and auditors' reports on internal control. Since then, Chinese regulators have issued a series of regulations. For example, in December 2007, the CSRC issued the *Notice on the Preparation of 2007 Annual Financial Reports by Public Firms and Other Related Issues*, which clearly encourages capable public firms such as financial companies to disclose the aforementioned reports. Five ministries, including the Ministry of Finance and the CSRC, jointly issued the *Basic Standards of Enterprise Internal Control* in May 2008. In December 2008, the SSE and SZSE each issued the *Notice on the Preparation of 2008 Annual Financial Reports by Public Firms*, requiring public firms to disclose their self-assessment reports on internal control and encouraging them to disclose their auditors' reports on internal control. Again in April 2010, the five ministries jointly issued the *Implementation Guidelines for Enterprise Internal Control*, *Guidelines for Assessment of Enterprise Internal Control* and *Guidelines for Audit of Enterprise Internal Control*. Firms cross-listed on domestic and international exchanges were required to adopt these guidelines from 1 January 2011, and firms listed on the main boards of the SSE and SZSE were required to do so from 1 January 2012. Since then, public firms have been encouraged to carry out effective self-assessments of their internal control, issue self-assessment reports on an annual basis, and appoint accounting firms to audit the effectiveness of their internal control over financial reporting and issue auditors' reports. However, during 2006–2010, the disclosure of self-assessment reports on internal control was partly mandatory, and that the disclosure of auditors' reports on internal control was voluntary.

Meanwhile, a great deal of regulatory effort has been made in China to encourage IDs to exert their influence over the corporate governance and internal control of public firms. For example, in August 2001, the CSRC issued *A Guiding Opinion on Establishing an Independent Directors System in Public Firms* (hereafter *A Guiding Opinion*), which requires at least one-third of board directors in public firms to be independent and at least one to be a financial expert. Further, it requires that if a board has a compensation, audit and/or nomination committee, at least half of the members of that committee should be independent. The CSRC also issued the *Code of Corporate Governance for Public Firms in China* (hereafter, the *Code*) in July 2002. The *Code* requires IDs to account for the majority of the members of these special, nomination and compensation committees and to chair their committees. Furthermore, it stipulates that at least one ID on an audit committee should be a financial expert. One of audit committee's main responsibilities is to examine the internal control system. This indicates that all audit committee members, including

IDs, should play their monitoring roles to ensure the effectiveness of the internal control system. In 2007, the SZSE issued the *Notice on the Preparation of 2007 Annual Financial Reports by Public Firms*, requiring public firms to disclose self-assessment reports on their internal control and IDs to express separate opinions on these reports. This shows that China's regulators entrust IDs with the duty of supervising public firms to improve their internal control and believe they should play an important role in doing so.

2.2 *Literature review*

Before the enactment of SOX, research on the role of BoDs in monitoring internal control was mainly normative due to the lack of relevant public data. For example, in analysing the ineffectiveness of internal control, Jensen (1993) argues that a corporate board's size is an important factor that decreases its effectiveness and ICQ. Section 404 of SOX requires public firms and their auditors to report on the effectiveness of their internal control of financing reports and disclose related material weaknesses. The publicly available data provide researchers with the opportunity to examine the effectiveness of internal control from a corporate governance perspective. Using the corporate governance indices, Doyle, Ge, and McVay (2007) and Hoitash, Hoitash, and Bedard (2009) find that the higher the board quality, the higher the ICQ. Fang, Sun, and Jin (2009) find that public firms with higher proportions of IDs are more likely to disclose internal control information.

Another stream of literature explores the effect of IDs on ICQ by analysing the monitoring role of IDs in audit committees. Krishnan (2005) finds internal control weaknesses and the proportion of IDs and financial experts on audit committees to be negatively related prior to SOX. Krishnan and Visvanathan (2007) examine this relationship in the post-SOX period and find similar results. In addition, they find that firms issue fewer financial restatements if they have a higher proportion of IDs and financial experts on their audit committees. Zhang, Zhou, and Zhou (2007) find that firms are more likely to be identified with internal control weaknesses if their audit committees have less financial expertise and the proportion of IDs on an audit committee is positively but insignificantly associated with the probability of disclosure of internal control weakness.

Moreover, prior studies find that firms with more IDs can remedy material internal control weaknesses more quickly (Goh 2009; Johnstone, Li, and Purley 2011), are more likely to disclose internal control reports voluntarily (Owusu-Ansah and Ganguli 2010) and have fewer internal control weaknesses (Chen et al. 2011). However, each of these studies investigates one ID characteristic rather than systematically combining ID characteristics and analysing their cumulative effect on ICQ.

3. Theoretical analysis and hypothesis formulation

According to agency theory, compared with executive directors, IDs can monitor managerial inertia and thereby mitigate the owner–manager agency problem (Fama and Jensen 1983). Beasley's (1996) empirical results show that firms with higher proportions of IDs experience higher earnings quality. These studies suggest that increasing IDs' monitoring power can enhance financial reporting quality and decrease agency costs.

Securities regulators in China and elsewhere recently initiated a series of reforms to improve the monitoring power of IDs in the hope of embedding it into internal control. For example, regulators such as the Securities and Exchange Commission (SEC) in the USA mandate that most board directors should be independent, and more importantly IDs should

serve on audit and compensation committees. As discussed in Section 2, China has issued similar regulations. ICQ is a function of the internal control environment, which includes BoDs and audit committees (Krishnan 2005). Audit committees directly monitor internal control and are responsible for overseeing ICQ, and BoDs assume ultimate responsibility and provide incremental oversight over internal control as part of their fiduciary duties (Goh 2009). Consequently, as board members and the main members of audit committees, IDs assume their natural duties to improve ICQ. Given the separation of ownership and control, management often has self-interested incentives that may not necessarily serve the best interests of shareholders. When internal control deficiencies are detected, management may not be willing to invest the time and resources necessary to ameliorate them because such efforts divert attention and resources away from their core business. IDs with strong monitoring power can pressure management into investing in remedying efforts, resulting in faster repair and thereby improving ICQ. Hence, we posit the following overall hypothesis:

H1: IDs' monitoring power is positively related to ICQ, other things being equal.

What comprises IDs' monitoring power? This question can be addressed by answering the following specific questions. First, do IDs have sufficient financial expertise to discover or disclose material internal control weaknesses? This depends on their professional competence, such as whether they have educational backgrounds or work experience in accounting and finance. Second, do IDs have sufficient incentives to discover and disclose material internal control weaknesses, or to express objective and separate opinions? IDs' incentives may be derived from the economic compensation provided by firms and reputation constraints from the market. Third, do IDs have balancing power on their BoDs to ensure that their separate opinions on improving ICQ are accepted? This requires IDs to have sufficient seats on their BoDs, i.e. the proportion of IDs should reach a certain level. Finally, do IDs diligently participate in the decision-making processes of their BoDs, and do they personally attend every board meeting? This question relates to their diligence. Taken together, these four dimensions constitute a framework of the role of IDs in internal control (Figure 1). We shed light on the extent to which each dimension contributes to improving ICQ and develop a hypothesis for each dimension in the following section.

Whether individual IDs can effectively exert their power of decision control depends on the ability they have accumulated from their past education and work experience. In response to the financial scandals exposed in the USA towards the end of the twentieth century, the Blue Ribbon

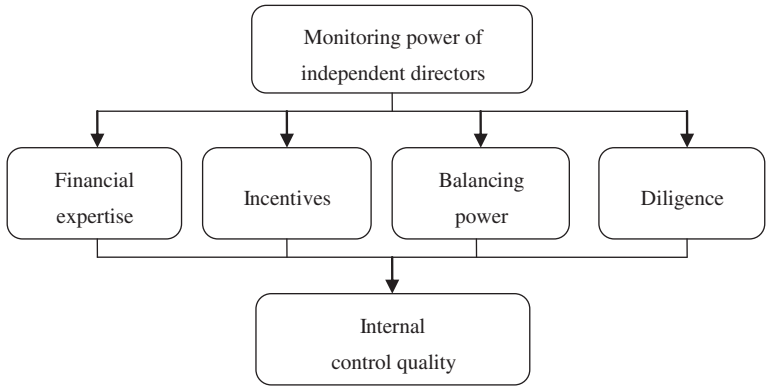

Figure 1. A framework of IDs' role in internal control.

Committee on Improving the Effectiveness of Corporate Audit Committees released a report on 8 February 1999 (Blue Ribbon Committee 1999), suggesting that the New York Stock Exchange and National Association of Securities Dealers require public firms with market capitalisation above $200 million to install audit committees with one member having accounting expertise and other members being financially literate. Increasing the number of directors with financial backgrounds was expected to enhance the overseeing of financial reports and internal control. After the eruption of the Enron scandal in 2001, the US Congress enacted SOX, which mandates that public firms disclose whether there are financial experts on their audit committees. *A Guiding Opinion* issued by the CSRC stipulates similar regulations (see Section 2). Empirical studies provide evidence of the role of IDs with financial backgrounds in areas such as constraining earnings management (Hu and Tang 2008) and decreasing financial restatements (Abbott, Parker, and Peters 2004). Therefore, we argue that IDs with financial backgrounds are more competent than those without financial backgrounds in executing their duties to improve ICQ. This reasoning leads us to the following hypothesis:

H1−a: Compared with other public firms, firms that have IDs with financial backgrounds have higher ICQ, other things being equal.

The second dimension of IDs' monitoring power is whether IDs have sufficient incentives to monitor internal control and improve its quality. IDs, who are neither corporate owners nor controllers, are participants with specific human capital and delegated as management monitors. Their incentives to do so derive from rewards and constraints. Bhagat and Tookes (2012) argue that as the shareholders' legal fiduciaries, IDs are expected to expend independent time and effort in their roles, and consequently, they should be compensated directly for their activities. IDs are typically experts who have garnered achievements or social influence in a certain field. As the value of their human capital is high, compensation is required for their invested human capital to ensure their contribution. When their benefits do not match their risks, they have insufficient incentives to monitor corporate management (Jensen 1993). In China, IDs receive compensation from their employers according to the relevant regulations and are thus motivated to exert their influence more effectively. Their active role in increasing ICQ is affected when the financial reward is insufficient. Consequently, the greater the IDs' compensation, the more efforts they invest in ICQ.

Another source of IDs' incentives is reputation constraints. According to agency theory, the multiple directorships of an ID send a strong signal to the market that the ID is of high quality (Fama and Jensen 1983). When IDs cannot perform their due diligence, their reputation is damaged and they can find it difficult to find jobs with other firms. Therefore, IDs actively perform their overseeing function under the constraints of reputation. Meanwhile, IDs with high reputations usually have more opportunities for employment. If an organisation's internal control is weak, the ID's reputation is likely to be seriously damaged. The more directorships an ID has, the greater is his or her reputation (Vafeas 1999). Taking Japan's public firms in the textile industry as examples, Miwa and Ramseyer (2000) find that the tougher the reputation constraints placed on IDs, the better their performance in their monitoring roles. In short, IDs can perform their monitoring roles more objectively and effectively under reputation constraints (Ye et al. 2011). Therefore, we hypothesise that:

H1−b1: IDs' compensation is positively related to ICQ, other things being equal.
H1−b2: IDs' reputation is positively related to ICQ, other things being equal.

The literature considers board independence to be one of the most effective factors for controlling firm behaviour. Board independence depends mostly on whether a corporate board has a sufficient number of IDs and hence whether it can effectively balance its decision-making process. Only when the proportion of IDs reaches a certain level can they exert their monitoring power objectively and independently and have their opinions supported by the board. Empirical studies demonstrate that corporate boards with higher proportions of IDs can more easily withstand external interference and hence offer more transparent financial information (Raheja 2005; Mallin and Ow-Yong 2012). Sawicki (2009) confirms that the increase in IDs, as a factor for improving corporate governance, is linked to higher dividend pay-outs, suggesting that improved shareholder protection enhances minority shareholders' ability to extract cash from corporate insiders. Increasing the proportion of IDs helps to decrease both the information asymmetry between controlling and minority shareholders and the occurrence of financial fraud (Beasley 1996; Chen et al. 2011). Therefore, we argue that increasing the proportion of IDs on a board increases the board's independence and thereby contributes to ICQ. This reasoning leads us to hypothesise that:

H1−c: The proportion of IDs on a BoD is positively related to ICQ.

IDs' diligence can directly influence their monitoring role in improving ICQ. This influence is mainly reflected in the time and energy that IDs invest. Board meetings represent an important opportunity for IDs to participate in the decision-making process and supervise. Therefore, the higher the proportion of board meetings that IDs attend, the more time and energy they invest, and thus the more effectively they supervise. Likewise, low diligence decreases the effectiveness of IDs' supervision and thus counteracts the improvement of ICQ. This reasoning leads us to the following hypothesis:

H1−d: The proportion of board meetings that IDs attend is positively related to ICQ, other things being equal.

4. Research design

4.1 *Models and variables*

We test the hypothesis that ICQ is a function of IDs' monitoring power (including competence, incentives, balancing power and diligence) and other control variables. Following Doyle, Ge, and McVay (2007), Hoitash, Hoitash, and Bedard (2009) and Johnstone, Li, and Purley (2011), we use model (1) to test H1 and model (2) to test H1-a, H1-b1, H1-b2, H1-c and H1-d.

$$\text{Logit}\left[\frac{\text{ICQ}_{i,t}}{(1-\text{ICQ}_{i,t})}\right] = \alpha_0 + \alpha_1 \text{Monitoring power index}_{i,t} + \{\text{Control}_{i,t}\} + \Sigma\text{Industry} + \Sigma\text{Year} + \delta_{i,t}, \quad (1)$$

$$\text{Logit}\left[\frac{\text{ICQ}_{i,t}}{(1-\text{ICQ}_{i,t})}\right] = \beta_0 + \beta_1 \text{Financial background } (0/1)_{i,t} + \beta_2 \text{Annual compensation}_{i,t} + \beta_3 \text{Directorships}_{i,t} + \beta_4 \text{Balancing power}_{i,t} + \beta_5 \text{Diligence}_{i,t} + \{\text{Control}_{i,t}\} + \Sigma\text{Industry} + \Sigma\text{Year} + \varepsilon_{i,t}. \quad (2)$$

We adopt two measures to proxy ICQ. One is *Auditor's report* (0/1), which is a dummy variable of whether a firm has disclosed auditors' reports on internal control. It is a reasonable proxy for ICQ in China. First, auditors' reports on internal control in China satisfy two basic signalling conditions: choice and imitation difficulty (Ross 1977). Public firms were not required to disclose auditors' reports on internal control before 2011. However, if a firm's ICQ were high, its managers would be willing to disclose the positive information (Lin and Rao 2009). Such reports cannot be easily imitated by firms with poor ICQ, as these firms have internal control weaknesses and few accounting firms were willing to audit their internal controls. Chinese auditors lacked guidance on internal control audit during our sample period, thus they were cautious about engaging in such auditing and tended only to audit public firms with high ICQ to control audit risks (Wang 2011). Therefore, imitating firms had to expend much effort on persuading auditors and pay them more than usual. Imitating firms also risk being seen by the market. Once a false report is exposed, imitating firms are punished by securities regulators and the market.

Second, during the 2006–2010 sample period, all auditors' reports on internal control were disclosed with positive opinions from the auditors, indicating good ICQ. For example, Wang (2011) shows that 72 firms in 2009 and 48 firms in 2010 disclosed auditors' reports on internal control, and all of them issued positive opinions. The reasons are straightforward. During 2006–2010, public firms were required neither to have their internal controls audited nor to disclose the related reports (see the discussion in Section 2). Only firms with effective internal control systems chose to appoint auditors and disclose their reports. Third, several empirical studies in China document that auditors' reports on internal control serve as effective signals to the market and can be a good proxy for ICQ (Lin and Rao 2009; Fang, Shi, and Zhang 2013).

Because the voluntary disclosure of auditors' reports on internal control is theoretically a signal of high ICQ and good internal control practice during our sample period, we argue that auditors' reports on internal control can serve as a good proxy for ICQ.

The other measure is *Financial restatements* (0/1), which is a dummy variable of whether firms experienced financial restatements during 2006–2010. A voluntary or SEC-enforced restatement of a financial statement suggests problems in the financial reporting model or earnings manipulation by management, and such weaknesses could be symptomatic of poor underlying internal control (Krishnan and Visvanathan 2007). Indeed, some studies demonstrate a significant relationship between internal control deficiencies and the likelihood of financial restatement (Ashbaugh-Skaife, Collins, and Kinney 2007; Muramiya and Takada 2010; Plumlee and Yohn 2010).

We measure IDs' monitoring power by establishing a composite index (*Monitoring power index*) consisting of four dimensions: IDs' financial expertise, incentives, balancing power and diligence. First, IDs' financial expertise is proxied by *financial background*. Following DeFond, Rebecca, and Hu (2005), we identify IDs with financial backgrounds if they have academic degrees or work expertise in finance, accounting or auditing, such as public accountants, auditors, principal or chief financial officers, controllers or principal or chief accounting officers. IDs' *financial background* is measured as the number of IDs with financial backgrounds divided by the total number of IDs. Second, IDs' incentives are proxied by both *Annual compensation* and *Directorships*. We use the natural log of the IDs' average annual compensation (*Annual compensation*) in the current year to measure their compensation incentives. Studies (e.g. Fama and Jensen 1983; Carcello et al. 2002; Goh 2009) demonstrate that the number of IDs' directorships can be a proxy of their professional competence and reputation. Third, we use the proportion of IDs on BoDs to measure their *Balancing power*. Finally, we use *Diligence* to measure the IDs' diligence. We divide the number of each ID's personal attendance at board meetings by the total number of meetings each ID

should have attended in the current year. *Diligence* equals the average ratio of every ID's personal attendance at board meetings, and the higher the average ratio, the higher is the IDs' diligence.

Following Francis, LaFond, and Olsson (2004), we calculate the *Monitoring power index* in the following way. We begin by ranking each of the five proxies and firm deciles. The firms in the top decile (decile 1) have the lowest proxy value of 1, and the firms in the bottom decile (decile 10) have the highest proxy value of 10. We then calculate the mean ranking of the five proxies for each sample firm and form an index of IDs' monitoring power. Using the decile rank of each attribute rather than its raw value alleviates the effects of extreme observations (Francis, LaFond, and Olsson 2004) and allows us to interpret the resulting coefficient estimates as the IDs' incremental monitoring power associated with the adjacent deciles.

Following previous studies, *Control* in models (1) and (2) represents two main categories of control variables: governance factors and firm characteristics. First, we include the following variables as proxies for corporate governance quality, as the studies demonstrate that they have important effects on ICQ (e.g. Doyle, Ge, and Mcvay 2007; Zhang, Zhou, and Zhou 2007; Hoitash, Hoitash, and Bedard 2009; Chen et al. 2011; Johnstone, Li, and Purley 2011): board size (*Director board size*), a BoD's operation in terms of the number of board meetings (*Board meetings*), CEO power (*Duality* (0/1)), supervisory board size (*Supervisory board size*), managerial ownership (*Managerial ownership*) and a dummy variable indicating whether public firms have established the four committees (i.e. audit, compensation and evaluation, strategy and nomination committees) (*Four committees* (0/1)). Due to the special ownership structure in China, we also add ownership concentration (*Ownership concentration*) and the nature of ultimate ownership (*State control* (0/1)) to control for their effects. Second, firms with poor profitability (*Return on equity*), risks of regulation violation (*Sanction* (0/1)), high growth (*Growth*), high leverage (*Leverage*), firm size (*Firm size*) and complex operations (*Auditing days*) are typically considered to have lower ICQ (Doyle, Ge, and McVay 2007). Chan, Ezzamel, and William (1993) argue that younger firms with fewer than 10 listing years usually have fewer internal control weaknesses. Therefore, we include these firm characteristics as control variables. We add two more dummy variables to control for the effects of auditors and differences in regulators on ICQ: *Big4* (0/1), which equals 1 if a firm's annual report is audited by an international Big 4 accounting firm, otherwise 0; and *Stock exchange* (0/1), which equals 1 if a firm is listed on the SZSE, otherwise 0. We include *Stock exchange* (0/1) to control for the stock exchanges' different regulations and influences on internal control. Moreover, we include industry (*Industry*) and year (*Year*) dummies to control for the industry effects and changes in the macroeconomic environment common to every firm over the sample period. All of the variables and their definitions are presented in Table 1.

4.2 *Sample selection*

Since 2006, Chinese regulators have issued a series of regulations on internal control and encouraged public firms to disclose their internal control information. Therefore, our initial sample comprised all firms listed on the SSE and SZSE from 2006 to 2010. We then applied the following restrictions: (a) a firm should not be a financial firm, (b) a firm should not be listed on the Growth Enterprise Board due to its short history and (c) a firm/year should not have missing data.

These criteria yielded a usable sample of 6764 observations representing 1606 firms. Of these, 782 (3331 observations) were listed on the SSE and 824 (3434 observations) on the SZSE. We manually collected the internal control data from the annual auditors' reports disclosed at http://www.cninfo.com.cn, the financial restatement data from temporary announcements in the Wind database and the financial background data from the management biographical introduction

Table 1. Definition of variables.

Variables	Definition
Auditor's report (0/1)	Equals 1 if a firm discloses the auditors' report on internal control, otherwise 0
Financial restatements (0/1)	Equals 1 if a firm has not conducted any financial restatements, otherwise 0
Monitoring power index	Following Francis, LaFond, and Olsson (2004); see variable design in Section 4.1
Financial background	Number of IDs with financial backgrounds divided by the total number of IDs
Annual compensation	Natural log of the means of the IDs' annual compensation
Directorships	Total ID directorships divided by the total number of IDs
Balancing power	Number of IDs divided by the total number of board directors
Diligence	Equals the sum of the ratio of each ID's personal attendance at board meetings divided by the total number of IDs, where the ratio of each ID's personal attendance at board meetings equals the total number of IDs' personal attendance at board meetings divided by the total number of board meetings that IDs should attend in the current year
Director board size	Ratio of the total number of board directors divided by the natural logarithm of total assets
Board meetings	Natural log of the total number of board meetings in one accounting year
Duality (0/1)	Equals 1 if the CEO and chairman are the same person, otherwise 0
Supervisory board size	Ratio of the total number of supervisory board members divided by the natural logarithm of total assets
Managerial ownership	Percentage of common stocks owned by managers and directors at the end of each accounting year
Four committees (0/1)	Equals 1 if a firm has audit, compensation and evaluation, strategy and nomination committees, otherwise 0
State control (0/1)	Equals 1 if the ultimate controlling owner is the state or state-owned, otherwise 0
Ownership concentration	Sum of the squared percentage of shares held by each of the top five shareholders
Firm age (0/1)	Equals 1 if a firm's listing age is less than 10, otherwise 0
Return on equity	Net profit divided by the book value of equity
Firm size	Natural log of the book value of total assets at the end of each accounting year
Auditing days	Natural log of the number of days spent on auditing annual reports
Growth	Difference in the total assets between the current accounting year and the previous accounting year divided by the total assets in the previous accounting year
Leverage	Book value of total debts divided by the book value of total assets
Sanction (0/1)	Equals 1if a firm was subject to CSRC disciplinary sanctions in the past 3 years, otherwise 0
Big4 (0/1)	Equals 1 if a firm's annual reports are audited by an international Big 4 accounting firm, otherwise 0
Stock exchange (0/1)	Equals 1 if a firm is listed on the SZSE, otherwise 0

in the corporate governance sub-database of the China Stock Market Accounting Research (CSMAR) database. We obtained the corporate governance and shareholder ownership data from the China Center for Economic Research (CCER) database and the remaining data from the CSMAR database. We crosschecked the data for consistency. To avoid the effects of outliers, all continuous variables are winsorised at 1% on both sides.

5. Empirical results

5.1 *Descriptive statistics*

Table 2 reports the descriptive statistics of the variables. Panel A presents the statistics of the dummy variables when their values equal 1. Auditors' reports on internal control were disclosed by 1456 firms, accounting for 21.50% of the total sample. No financial restatements were issued for 6313 observations, accounting for 93.30% of the total sample. This indicates that a small proportion of firms voluntarily disclosed their auditors' reports on internal control, and that most firms did not release financial restatements. Panel A also reveals that more than half of the sample firms had established four committees, and that nearly 60% of the observations' ultimate controllers were state-owned. Further, for 955 of the observations, the CEO and board chairman were the same person, accounting for 14.71% of the sample. Only a small proportion of firms received regulatory punishments or were audited by an international Big 4 accounting firm. The sample firms listed on the SZSE and SSE account for half of all sample firms, and more than 50% of the sample firms have a listing history of 10 or more years.

Panel B presents the statistics of the continuous variables. The average composite IDs' monitoring power is 5.504, with a minimum of 1 and a maximum of 9.8. This implies that there is a considerable gap in the IDs' monitoring power among China's public firms. The average percentage of IDs with a financial background is 52.57%, ranging from 0% to 100%. This indicates that some public firms have no IDs with a financial background. ID compensation ranges from 0 to 125,000 yuan and the average is 19,400 yuan. The average number of directorships is 1.747, ranging from 1 to 5. The average proportion of IDs is 36.07%, with a minimum and maximum of 25% and 55.56%. The percentage of board meetings attended by IDs ranges from 33.33% to 100%, with an average of 94.73%. This suggests that some IDs did not attend two-thirds of their board meetings. Panel B also shows that the sample firms each have an average of 9 board members (0.427×21.491) and 8.35 board meetings per year ($e^{2.122}$), and that there are 4 members on each supervisory board ($e^{0.182}$). Managerial ownership is relatively low at only 0.034% on average. The mean of ownership concentration is 0.169.

To test for multicollinearity, we calculate the variance inflation factors for the independent variables. The largest is 4.22, well below the rule-of-thumb cut-off of 10.0 for multiple regression models (Kennedy 1998). We thus conclude that multicollinearity is unlikely to be a serious problem in our study.

5.2 *Multivariate results*

Table 3 displays the results of the regression models used to test our hypotheses. Columns (1) and (2) report the results when ICQ is proxied by *Auditors' reports* (0/1), and Columns (3) and (4) report the results when ICQ is proxied by *Financial restatements* (0/1). The results in Column (1) show that *Monitoring power index* has a positive relationship with *Auditor's report* (0/1), significant at the 1% level. This means that IDs' overall monitoring power improves ICQ, which supports H1. In Column (2), *Financial background* is significantly and positively related to *Auditor's report* (0/1) at the 10% level. This result implies that IDs' financial backgrounds are useful in maintaining and improving ICQ. Thus, H1-a is supported. As for IDs' incentives, the result indicates that the possibility of a firm disclosing an auditors' report (*Auditor's report* (0/1)) is positively and significantly related to its IDs' compensation (*Annual compensation*) at the 1% level and its IDs' reputation constraints (*Directorships*) at the 10% level. These findings are consistent with H1-b1 and H1-b2, indicating that the stronger the IDs' incentives, the higher

Table 2. Descriptive statistics.

Panel A: Descriptive statistics of dummy variables

Variables	Number	Percentage of the full samples	Variables	Number	Percentage of the full samples
Auditor's report $(0/1)_{i,t}$	1456	21.50	Sanction $(0/1)_{i,t}$	293	4.33
Financial restatements $(0/1)_{i,t}$	6313	93.30	Big4 $(0/1)_{i,t}$	354	5.23
Four committees $(0/1)_{i,t}$	4309	63.70	Stock exchange $(0/1)_{i,t}$	3434	50.77
Duality $(0/1)_{i,t}$	955	14.71	Firm age $(0/1)_{i,t}$	3521	52.05
State control $(0/1)_{i,t}$	3943	58.29			

Panel B: Descriptive statistics of continuous variables

Variables	Observations	Means	Median	Minimum	Maximum	1/4 fractile	3/4 fractile
Monitoring power index$_{i,t}$	6764	5.504	5.400	1.000	9.800	4.400	6.600
Financial background$_{i,t}$	6764	0.526	0.500	0.000	1.000	0.333	0.667
Annual compensation$_{i,t}$	6764	9.875	9.984	0.000	11.736	9.383	10.820
Directorships$_{i,t}$	6764	1.747	1.667	1.000	5.000	1.250	2.155
Balancing power$_{i,t}$	6764	0.361	0.333	0.250	0.556	0.333	0.375
Diligence$_{i,t}$	6764	0.947	0.970	0.333	1.000	0.917	1.000
Board director size$_{i,t}$	6764	0.427	0.421	0.234	0.699	0.387	0.456
Board meetings$_{i,t}$	6764	2.122	2.079	1.386	3.178	1.946	2.303
Supervisory board size$_{i,t}$	6764	0.182	0.148	0.098	0.378	0.140	0.230
Managerial ownership$_{i,t}$	6764	0.034	0.000	0.000	2.677	0.000	0.000
Ownership concentration$_{i,t}$	6764	0.169	0.142	0.001	0.680	0.075	0.243
Returns on equity$_{i,t}$	6764	0.075	0.076	−0.605	0.554	0.030	0.131
Firm size$_{i,t}$	6764	21.491	21.406	18.826	24.749	20.693	22.182
Auditing days$_{i,t}$	6764	4.733	4.771	3.892	4.997	4.644	4.913
Growth$_{i,t}$	6764	0.180	0.105	−0.420	1.805	0.001	0.256
Leverage$_{i,t}$	6764	0.528	0.513	0.069	2.401	0.359	0.646

Notes: This table presents the descriptive statistics for sample firms during 2006–2010. All variables are as defined in Table 1.

Table 3. The results of the Logit models.

	Y=Auditor's report (0/1)		*Y*=Financial restatements (0/1)	
	(1)	(2)	(3)	(4)
Monitoring power index$_{i,t}$	0.178 (7.57)***		0.229 (6.62)***	
Financial background$_{i,t}$		0.208 (1.77)*		0.206 (1.13)
Annual compensation$_{i,t}$		0.216 (4.44)***		0.087 (3.37)***
Directorships$_{i,t}$		0.089 (1.81)*		0.194 (2.41)**
Balancing power$_{i,t}$		0.692 (0.94)		2.978 (2.58)***
Diligence$_{i,t}$		1.436 (2.79)***		2.083 (3.64)***
Director board size$_{i,t}$	1.690 (4.04)***	1.550 (3.51)***	0.644 (0.99)	0.739 (1.10)
Board meetings$_{i,t}$	−0.122 (−1.23)	−0.137 (−1.39)	−0.193 (−1.29)	−0.199 (−1.34)
Duality (0/1)$_{I,t}$	0.216 (2.40)**	0.211 (2.35)**	−0.065 (−0.45)	−0.054 (−0.38)
Supervisory board size$_{i,t}$	1.716 (2.60)***	1.714 (2.61)***	0.266 (0.30)	0.221 (0.25)
Managerial ownership$_{i,t}$	0.829 (4.16)***	0.820 (4.12)***	1.220 (1.73)*	1.193 (1.68)*
Four committees (0/1)$_{i,t}$	0.064 (0.94)	0.071 (1.04)	−0.058 (−0.51)	−0.043 (−0.38)
State control (0/1)$_{i,t}$	−0.231 (−3.09)***	−0.234 (−3.12)***	−0.081 (−0.67)	−0.091 (−0.76)
Ownership concentration$_{i,t}$	2.103 (7.01)***	2.095 (6.94)***	−0.024 (−0.05)	−0.077 (−0.17)
Firm age (0/1)$_{i,t}$	0.726 (9.17)***	0.721 (9.12)***	0.218 (1.83)*	0.223 (1.87)*
Returns on equity$_{i,t}$	0.931 (3.20)***	0.944 (3.24)***	0.478 (1.41)	0.517 (1.53)
Firm size$_{i,t}$	0.028 (0.75)	0.002 (0.05)	0.078 (1.42)	0.053 (0.99)
Auditing days$_{i,t}$	−0.200 (−1.40)	−0.200 (−1.39)	−0.103 (−0.45)	−0.094 (−0.42)
Growth$_{i,t}$	1.016 (10.23)***	1.014 (10.21)***	0.188 (1.04)	0.195 (1.07)
Leverage$_{i,t}$	−0.735 (−5.70)***	−0.730 (−5.60)***	−0.523 (−3.94)***	−0.499 (−3.70)***
Sanction (0/1)$_{i,t}$	−0.108 (−0.66)	−0.094 (−0.57)	−0.697 (−3.63)***	−0.698 (−3.58)***
Big4 (0/1)$_{i,t}$	−0.277 (−1.49)	−0.261 (−1.41)	0.161 (0.60)	0.178 (0.67)
Stock exchange (0/1)$_{i,t}$	0.556 (7.48)***	0.576 (7.36)***	0.318 (2.82)***	0.193 (1.70)*
Industry/year	Yes	Yes	Yes	Yes
Observations	6764	6764	6764	6764
Pseudo-R^2	0.144	0.145	0.064	0.063

Notes: This table presents the logit regression results. Columns (1) and (2) present the results when ICQ is proxied by *Auditor's report* (0/1), and Columns (3) and (4) present the results when ICQ is proxied by *Financial restatements* (0/1). The key independent variables include *Monitoring power index*, *Financial background*, *Annual compensation*, *Directorship*, *Balancing power* and *Diligence*. *Z*-statistics are placed in brackets to the right of their corresponding coefficients. Standard errors are clustered at the firm level. The coefficients of the constant, industry and year dummies are omitted for brevity. All variables are as defined in Table 1.

*Significance at the 10% level (two-tailed).

**Significance at the 5% level (two-tailed).

***Significance at the 1% level (two-tailed).

is the ICQ. The IDs' balancing power is positively related to the possibility of a firm disclosing an auditor's report (*Auditor's report* (0/1)). However, the coefficient is insignificant and the result does not support H1-c. The coefficient of *Diligence* is significant and positive at the 1% level, which implies that the greater the diligence, the higher is the ICQ. This result supports H1-d.

The results in Column (3) show that the overall monitoring power of IDs (*Monitoring power index*) is significantly and positively related to *Financial restatements* (0/1), implying that the stronger the IDs' monitoring power, the lower is the probability of financial restatement and hence the higher is the ICQ. In Column (4), *Annual compensation*, *Directorships*, *Balancing power* and *Diligence* are significantly positively associated with ICQ. In short, the results are almost the same as those for *Auditor's reports* (0/1).

6. Robustness checks

In this section, we perform the following robustness checks to examine the sensitivity of our results.

6.1 *An instrumental-variable estimation*

We test the hypothesis that ICQ is a function of IDs' monitoring power and other control variables. However, the results may be affected by the problem of endogeneity. For example, ICQ may be a determinant affecting IDs' monitoring power (Li et al. 2012). Endogeneity may also arise from omitted unobserved factors (e.g. management expertise) that may be correlated with both ICQ and the IDs' monitoring power.

We conduct an instrumental-variable estimation in this section. Central to this approach is the identification of at least one appropriate instrument for measuring IDs' monitoring power. Following previous studies (e.g. Hu and Tang 2008; Bucciol and Miniaci 2011) and taking into account the practical situation in China, we identify the following determinants of IDs' monitoring power in addition to the control variables in model (1).

Place (0/1) equals 1 if the IDs' workplace is consistent with the registered address of the public firm, otherwise 0. If *Place* (0/1) does equal 1, IDs may have close private relationships with the managers of the listed companies (Tang, Du, and Shen 2010) that affect their monitoring power. Tang, Du, and Shen (2010) find that IDs whose workplace is consistent with the registered address of a public firm have weaker monitoring power than other IDs and are less likely to say 'no' in their separate opinions, hoping to lower the probability of being fired.

However, *Place* (0/1) is not expected to be related to the error terms in the ICQ regressions. Most public firms nominate IDs to meet the CSRC requirements (Chen and Al-Najjar 2012). For example, we find that 89.11% of A-share public firms during 2006–2010 meet the requirement that at least one-third of their board directors should be independent. This shows that a firm does not merely appoint an ID to improve ICQ. Therefore, ICQ is rarely considered as a factor determining board independence. Moreover, the nomination of IDs is mostly decided by controlling shareholders rather than managers in China. Whether the workplace information of an ID matches the registered address of a public firm does not determine whether that ID is nominated by a controlling shareholder. The lack of a strong link between ICQ and *Place* (0/1) helps to qualify the latter as an instrumental variable for ICQ. Indeed, we find no significant relationship between *Place* (0/1) and ICQ in our correlation and regression analyses, in which we control for the proxies for IDs' monitoring power. Therefore, we use *Place* (0/1) as our instrumental variable.

Circulating stocks: As circulating stocks are held mostly by minority shareholders, including institutional investors, companies with higher proportions of circulating stocks have a stronger demand for IDs' monitoring power due to the existence of serious interest conflicts between controlling and minority shareholders (Hu and Tang 2008). *Circulating stocks* is defined as the ratio of the number of circulating shares divided by the total number of shares.

ID_Gender: The experimental economics and psychology literature documents gender-related differences in risk aversion. For example, Sunden and Surette (1998) find that women are significantly more risk averse in their allocation of wealth to pensions. *ID_Gender* is measured as the ratio of male IDs to total IDs.

ID_Age: This refers to the IDs' average age, which may also affect their risk-aversion preferences. Prendergast and Stole (1996) offer theories based on career considerations and suggest that reputational considerations increase with age. Several studies suggest that risk taking decreases with an individual's age (e.g. Bucciol and Miniaci 2011).

In the first stage of the instrumental-variable estimation, we regress the IDs' monitoring power on the instrumental variable and the control variables by OLS. The predicted value of IDs' monitoring power and the first-stage residuals are then included in model (1) to replace the original value of IDs' monitoring power in the second stage. We then re-estimate the models and report the results in Table 4.

The results from the first-stage instrumental model presented in Column (1) show that IDs' monitoring power (*Monitoring power index*) is significantly and positively related to *ID_Gender*, *ID_Age* and *Circulating stocks*, but negatively related to *Place* (0/1). The partial F-statistic for *Monitoring power index* in the first-stage model is 138.95, well exceeding 8.96, the rule of thumb proposed by Stock, Wright, and Yogo (2002), which indicates that the instrumental variable is appropriate.

Table 4. Instrumental-variable regression results.

	First-stage regressions	Second-stage regressions	
	(1)	(2)	(3)
	Y = Monitoring power index	Y = Auditor's report (0/1)	Y = Financial restatements (0/1)
Place $(0/1)_{i,t}$	−0.251 (−7.29)***		
ID_Gender$_{i,t}$	0.624 (6.81)***		
ID_Age$_{i,t}$	0.022 (7.93)***		
Circulating stocks$_{i,t}$	1.525 (19.58)***		
Adjusted R^2	0.233		
Partial F-Stats	138.95***		
Predicted monitoring power index$_{i,t}$		0.165 (3.62)***	0.402 (5.95)***
Observations		6764	6764
Wald χ^2		824.10***	90.88***
Wald test of exogeneity χ^2		2.94*	43.71***
Test of over-identifying restrictions		0.635	4.077

Notes: This table presents instrumental-variable regression results. Column (1) presents the main results from the first-stage regression and Columns (2) and (3) present the main results from the second-stage regressions. Z-statistics are placed in brackets on the right of their corresponding coefficients. Control variables in model (1) and constants are not reported for brevity. All variables are as defined in Table 1.

*Significance at the 10% level (two-tailed).

***Significance at the 1% level (two-tailed).

Columns (2) and (3) of Table 4 show that the test results fail to reject the over-identifying restrictions for the endogenous *Auditor's report* and *Financial restatements* variables, supporting the assumption that the instrument is exogenous. The formal over-identification tests indicate that our instrument is likely to produce better estimates than the probit models for *Auditor's report* and *Financial restatements* when the IDs' monitoring variable is *Monitoring power index*. We also perform the Wald test of exogeneity to justify the use of ivprobit rather than probit results. For our sample, the Wald test of exogeneity significantly rejects the exogeneity of *Financial restatements* and *Auditor's report* for *Monitoring power index*, suggesting that the ivprobit estimation is superior to the probit estimation. These analyses suggest that the ivprobit results provide a more appropriate basis for inferential conclusions than probit estimates.

Comparing the results from Table 3 and Columns (2) and (3) of Table 4, we can see that the coefficient estimates are broadly similar. Therefore, our finding on the positive role of IDs' monitoring power in ICQ appears to be broadly robust to the instrumental-variable estimation.

6.2 *Paired-sample test*

The number of sample firms that conduct financial restatements is limited, which may affect the reliability of the regression results. To address this issue, we adopt a paired-sample test. Consistent with previous research (Abbott, Parket, and Peters 2004), we match each sample firm conducting financial restatements with a control firm listed on the same exchange and with the same auditor (Big 4 or not), and a similar market value of equity and firm size (within 30% of the sample firm) in the same year. We also select the control firm from the same industry based on the 2001 CSRC industry classification. In every case, we ensure that none of the control firms releases financial restatements during 2006–2010. Columns (1) and (2) of Table 5 report the logit regression results using a matched-pair sample similar to those in Table 3.

6.3 *Dependent variable substitution*

Following previous studies (e.g. Ashbaugh-Skaife, Collins, and Kinney 2007; Doyle, Ge, and McVay 2007; Lin and Rao 2009), we construct an ICQ index (*ICQ_I*). The evidence suggests that firms that are smaller, financially unhealthy, operationally complex, undergoing restructuring or releasing financial restatements are associated with a lower ICQ, and that firms with audit committees, that are growing rapidly, that are younger or do not violate rules and regulations have a higher ICQ. We construct the ICQ index using a score based on the following nine factors: firm size, firm age, financial health, operational complex, rapid growth, organisational change, audit committee, violation of rules and regulations and financial restatement.

Using *ICQ_I* as the dependent variable, we run an OLS regression. The results, which are reported in Columns (3) and (4) of Table 5, are broadly similar to those in Table 3.

6.4 *Independent variable substitution*

Large firms are more willing to hire IDs with higher social reputations and pay them higher compensation. However, according to economies of scale, large firms have higher ICQ because they incur smaller marginal costs of establishing and maintaining internal control systems and have more resources to pay for internal control auditing and consulting fees (Lin and Rao 2009). As a result, the effect of IDs' incentives on ICQ may be influenced by firm size. To avoid this

influence, we divide *Annual compensation* and *Directorships* by firm size, re-run the logit models and report the results in Columns (1) and (2) of Table 6.

We also use an alternative approach, principal components analysis (PCA), to construct the IDs' monitoring power index (*Monitoring power index_PCA1* and *Monitoring power index_PCA2*). We

Table 5. The main results of matched-pair sample tests and dependent variable substitution.

	Matched-pair sample tests		Dependent variable substitution	
	Y = Financial restatements (0/1)		Y = ICQ_I	
	(1)	(2)	(3)	(4)
Monitoring power index$_{i,t}$	0.240 (4.20)***		0.036 (3.57)***	
Financial background$_{i,t}$		0.033 (0.12)		0.067 (1.23)
Annual compensation$_{i,t}$		0.132 (1.76)*		0.044 (3.75)***
Directorships$_{i,t}$		0.111 (0.87)		0.042 (1.89)*
Balancing power$_{i,t}$		3.499 (2.11)**		−0.068 (−0.21)
Diligence$_{i,t}$		3.682 (3.08)***		0.476 (2.10)**
Observations	902	902	6764	6764
Pseudo-R^2	0.213	0.215		
Adjusted R^2			0.193	0.195

Notes: Columns (1) and (2) present the main results of the matched-pair sample test for *Financial restatements* (0/1) as a measure of ICQ, and the results of the control variables as described in models (1) and (2) are omitted for brevity. Column (3) and (4) present the results for *ICQ_I* as a measure of ICQ, and the untabulated control variables include all of the control variables used in model (1) except for *Firm size*, *Firm age*, *Auditing days*, *Growth*, *Four committees* (0/1) and *Sanction* (0/1). Brackets on the right of coefficients are *Z*-statistics in Columns (1) and (2), and are *T*-statistics in Columns (3) and (4), respectively. Standard errors are clustered at the firm level. All variables are as defined in Table 1.
*Significance at the 10% level (two-tailed).
**Significance at the 5% level (two-tailed).
***Significance at the 1% level (two-tailed).

Table 6. The main results of the regressions with alterative independent variables.

	Y = Auditor's report (0/1)			
	(1)	(2)	(3)	(4)
Monitoring power index$_{i,t}$	0.169 (7.35)***			
Financial background$_{i,t}$		0.248 (2.15)**		
Annual compensation/Firm size$_{i,t}$		3.633 (4.70)***		
Directorships/Firm size$_{i,t}$		1.976 (1.90)*		
Balancing power$_{i,t}$		0.665 (0.91)		
Diligence$_{i,t}$		1.643 (3.20)***		
Monitoring power index_PCA1$_{i,t}$			0.248 (6.78)***	
Monitoring power index_PCA2$_{i,t}$				0.142 (4.14)***
Observations	6764	6764	6764	6764
Pseudo-R^2	0.108	0.109	0.143	0.138

Notes: The results of the control variables as described in models (1) and (2) and the constants are omitted for brevity. *Z*-statistics are placed in brackets to the right of their corresponding coefficients. The standard errors are clustered at the firm level.
*Significance at the 10% level (two-tailed).
**Significance at the 5% level (two-tailed).
***Significance at the 1% level (two-tailed).

include the five proxies for IDs' monitoring power (*Financial background*, *Annual compensation*, *Directorships*, *Balance power* and *Diligence*) as the original variables, standardise them and then conduct a PCA. We retain the first (second) factor that explains 23.15% (20.61%) of the five IDs' monitoring variables and use it to proxy for *Monitoring power index_PCA1* (*Monitoring power index_PCA2*). The main results, which are reported in Columns (3) and (4) of Table 6, are similar to those in Table 3.

7. Conclusions and implications

China's regulators are actively speeding up the construction of internal control mechanisms. As an element of the control environment, corporate governance has a direct effect on ICQ. From the perspective of ID characteristics, we conceive a theoretical framework of IDs' monitoring power, including specialist expertise or competence, incentives, balancing power and diligence. Using data of A-share firms during 2006–2010, we provide empirical evidence that IDs' monitoring power improves ICQ measured by voluntary disclosure of auditors' reports on internal control and the financial restatements. This indicates that one important mechanism for enhancing ICQ is to strengthen the monitoring power of IDs, especially in companies in which the IDs possess weak monitoring power.

We also find that the four dimensions used to construct the ID monitoring power index are significantly and positively associated with either or (in most cases) both measures of ICQ. That some proxies of IDs' monitoring power are not significantly associated with ICQ does not necessarily mean they do not contribute, because they interact with other proxies. However, to the extent that these empirical findings are reliable, they shed light on some specific methods for strengthening the role of IDs in improving ICQ. The financial backgrounds of IDs are significantly and positively related to ICQ though the results become insignificant when the matched-pair sample and *ICQ_I* are used (Table 5). This result partially supports the regulatory requirement that certain board members and especially auditing committee members should be financial experts.

In addition, we find that appropriate financial compensation can enhance IDs' incentives to play better monitoring roles. The policy implication is that China's securities regulators and public firms should increase financial compensation to low-paid IDs. Meanwhile, Fama and Jensen (1983) argue that a high level of monitoring power comes from IDs' motives to protect their own reputations in the outside labour market. However, China has not yet established a well-developed ID labour market. This is perhaps the root cause of the insignificant effect of IDs' reputation on ICQ in the matched-pair sample test in Table 5. Therefore, great efforts should be made to strengthen the ID labour market and improve relevant regulations so that reputation constraints can play an effective role.

The proportion of IDs has a significant and negative effect on the occurrence of financial restatements, but not on the voluntary disclosure of auditors' reports on internal control. The results seem to indicate that IDs' balancing power plays an important role when material internal control weaknesses exist. Our results are similar to the finding of Ye et al. (2011) that IDs are more likely to vote against management proposals when their firms perform poorly. The results suggest that firms can improve their corporate governance by adding more IDs to their boards and encourage IDs to play more active roles in corporate governance.

Finally, our results show that the higher the IDs' diligence, the higher is the ICQ. As it has long been difficult to observe the decision control behaviour of IDs, there is very limited relevant research. This study provides empirical evidence of the positive role of IDs' diligence in improving

ICQ by observing whether IDs personally attend board meetings. The results indicate that IDs' participation in the decision-making process facilitates the improvement of ICQ.

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