

# Better Effectiveness with Audit Committees: Evidence from China

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**Abstract** This study empirically explores China's supervisory mechanisms whether the listed companies with Audit Committees (G2) are more effective than those without (G1). Using a panel data base of 2148 compared to 1873 firm-year observations over the 2005 to 2007 period by the multiple linear regressions, the findings report Chinese listed companies with Audit Committees have better independence, expertise and activities proved by 12 of 15 variables of better G2 coefficient than G1; and statistically significant evidences present in 5 aspects, the listed companies with Audit Committees have (1)less proportion of independent directors receiving remuneration; (2-3) more legal and internal auditing expertise in Supervisory Boards; (4) more meeting times on the BoD; and (5)the quantity of Supervisory Boards' size may not impact upon the effective quality of supervisory mechanisms. The findings of which may provide impetus for further research in Chinese setting and help refine general knowledge on the role of supervisory mechanisms in corporate governance.

**Keywords** Effectiveness, Audit Committee, Supervisory Board, Corporate Governance

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## 1. Introduction

The Corporate Governance (CG) supervisory mechanism in China is rather unique in having simultaneously established the Audit Committees (ACs) in the board and the Supervisory Board (SB) at the same time. At first in 1993, China adopted two-tier boards, with SBs based on the German CG model. But later on in 2002, it adopted the ACs based on the Anglo-American CG model. China thus combined the two models of CG supervisory mechanisms at the same time. Xiao et al. (2004) studied the role of the SB in China, and found that a two tier board is also fraught with problems. Other studies also found no evidence exists indicating that the SB can effectively monitor the management. Su et al. (2005) found that neither board can perform an effective monitoring function. Liu and Sun's (2005) finding suggests that CG supervisory control

mechanisms over the management could be further enhanced, particularly through CG reform in China's transitional economy.

Since 2002, China has allowed the listed companies the choice to establish Anglo-American AC system. The AC, formed by the independent directors, is the core of the Anglo-American CG model of internal supervisory mechanism. The relevant studies of Buchanan (2007), Huang (2005), Shi (2006), Strikwerda (2003), Tan et al. (2007), Tian and Feng (2004), Ye (2001), and Yuan (2005) have found that their shares and associated rights are widely distributed and frequently exchanged among numerous small investors. That is, the direct influence of individual investors over the corporation is relatively small compared with that of the management; however shares can be easily exchanged, which can lead to fluctuation of the stock price. Although the AC is appointed by the board of directors (BoDs), it has no authority over the management. It is not guaranteed that the AC's performance will meet the shareholders' expectation. The AC is rooted in shareholder agency theory that implies a need for supervisory functions as managers cannot be trusted to act in the shareholders' interests. This factor must be taken into consideration when making managerial decisions, in order to provide a mechanism for aligning the interests of the management with those of the ownership. It is also noted that the ownership of CG may affect the levels of management control.

China's ownership is rooted in the institutional ownership theory that defines institutional shareholdings as so large that it is difficult to switch owners' invested capital from one firm to another (Changati and Damanpour, 1991) As a result, these shareholdings play an important role in the decision-making processes of the firms in which they have invested. As Chinese listed firms are usually controlled by the government or parent state-owned enterprises (SOEs), they have very few political costs than their US counterparts. As controlling shareholders are usually government agencies or parent SOEs, it is very difficult for Chinese investors to effectively sue business managers (usually appointed by the controlling shareholders) and controlling shareholders. The controlling shareholders of many listed firms, primarily government agencies or SOEs,

are concerned only about raising funds from the stock market. For Chinese listed firms, the primary benefit of introducing an AC is that the firms may be able to raise funds in the capital market at a lower cost or sell shares at a higher price as the market may perceive that higher quality supervision will ensure better information disclosure. The costs are the reduction in opaqueness of profits: the AC's high monitoring standards may inhibit the controlling owners from maximizing their self-interest through benefit transfer. Because of the difference in ownership structure between Anglo-American agency theory and Chinese institutional ownership theory, the AC is started and developed from west countries such like US and UK, it is therefore wondered about the AC's effectiveness in China especially when China already have SBs in the internal supervisory functions. The ultimate test of earnings quality is the market's response to earnings (PER), which provides a measure of the extent to which new earnings information is capitalized in the stock price (Kim and Kross 2005; Ryan and Zarowin 2003). This study based on the related studies to define the dependent variable of PER and relevant independent variables of ACs' characteristics of independence, expertise and activities, and compare them in two separate samples. After comparing the coefficients of two systems with (G2) and without ACs (G1) in China, the test results present 12 of 15 independent variables are the same as the hypothesis including all of four independence; two expertise, two activity and four control variables. The other three variables of SBs' meeting times, financial expertise and party member employees reveal contradict to hypothesis. Yet the contradict results also present the listed companies with ACs have more activities of meeting times and financial expertise on ACs and have less party member employee without financial, legal or internal audit expertise of SBs in the listed firms with ACs. In another word, these three adverse results also prove the listed companies with ACs have better effectiveness than those without ACs in China. The test results also provided statistically significant evidence present in five aspects: The listed companies with ACs have (1) less proportion of independent directors receiving remuneration; (2-3) more legal and internal auditing expertise in SBs; (4) more meeting times on the BoD; and (5) the quantity of the size of SBs may not impact upon the effectiveness of internal supervisory functions.

The remainder of this paper is organized as follows. Section II introduces the background and overview of prior researches for developing the hypothesis. Section III describes the research method. Section IV presents the empirical findings and analysis, and Section V concludes the study.

## 2. Background and Related Study

### Background and Question

The role of an AC in CG has been one of the most significant subjects of monitoring research. In its monitoring function, CG strives to create a mechanism for minimizing the risk of harmful practices by, for example, reducing the possibility of fraudulent accounting practices (OECD 1999; OECD 2004a), as in Enron's case. The internal supervisory CG mechanism is not compulsory in certain other countries' regulations. National conditions determine whether these countries should develop CG mechanisms. DeZoort et al. (2002) reported that the definition of an effective AC varies. Sharma et al. (2011) demonstrated that ACs can pose moderate threats to auditor independence, thus supporting the quality of financial reporting. Agoglia et al. (2011) found no effect of AC strength when the standard is less precise. Naiker and Sharma (2009) found that the presence of the AC of former partners who are affiliated or unaffiliated with the firm's external auditor is associated with more effective monitoring, internal controls, and financial reporting. Abbott et al. (2007) reported that firms with independent, active, and expert ACs were less likely to outsource routine internal audit activities to an external auditor. They asserted that an effective AC can monitor the sourcing of a firm's total (i.e., internal and external) audit coverage. Krishnan (2005), however, found that independent ACs and ACs with financial expertise are significantly less likely to be associated with the incidence of internal control problems. Collier (1996) concluded that evidence of ACs' effectiveness is very limited and certainly insufficient to support their rapid increase in popularity, describing it a "curious phenomenon." Goodwin and Seow (2002, 220) asserted that "further investigation into the effectiveness of AC is needed." All the related studies of ACs found their effectiveness an issue of concern.

Currently, both with- and without-AC systems exist simultaneously among China's listed companies. The regulations of Chinese ACs' forerunners in the US and UK stipulate that establishing an AC is compulsory for every listed company (SOX 2002; SOX 2003; FRC 2008; FRC 2010). However, China's Securities and Exchange Commission's (SEC's) regulations, Section 52 of the Code of CG for Listed Companies, for establishing the monitoring system of ACs of CG states that establishing an AC is optional, not a compulsory requirement. The 1993 Company Law stipulated that every listed company should establish a SB. The 2002 Code of CG for Listed Companies encouraged every listed company to set up an AC voluntarily. The SBs have not been abolished from the regulation, though ACs have been introduced in China. The willingness to install the ACs has increased from 1% (12) in 2000 to 99.86% (2106) in 2010 among listed companies as shown in Table 1: Chinese companies establishing ACs between 2000 and 2010.

Given that many Chinese companies have introduced ACs willingly into their governance structures, the question is raised as:

*Whether the listed companies with ACs are more effective than those without ACs in China?*

*Overview of Prior Research*

**Table 1.** Chinese companies establishing ACs between 2000 and 2010

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
No. of Co.	1092	1140	1205	1266	1355	1351	1434	1545	1602	1751	2109
Increase in No. of Co.		48	65	61	89	-4	83	111	57	149	358
Increase in % of Co.		4.40%	5.70%	5.06%	7.03%	-0.3%	5.79%	7.18%	3.56%	8.51%	16.97%
No. of Co. with AC	12	73	312	483	604	641	640	635	1586	1745	2106
Increase in No. of Co. with AC		61	239	171	121	37	-1	-5	951	159	361
% of Co. with AC	1.13%	5.38%	19.92%	38.15%	44.61%	47.45%	44.63%	41.10%	99.00%	99.66%	99.86%

(Source: Author, as supported by the CCER Database)

**Measurement of Effective Internal Supervisory Functions**

This topic has been extensively studied in many developed countries. Especially in the US, the Audit Committees (AC) plays the key role of internal supervisory structure. At present, there is still scant empirical evidence on the effects of internal corporate governance practices in China. To date, studies on the effectiveness of board composition have yielded mixed results. For example, while Rosenstein and Wyatt (1990) found a favourable stock price (SP) reaction to announced appointments of additional outside directors, Beasley (1996) observed a negative relationship between the proportion of non-executive directors and the likelihood of fraud. Several other studies found no significant link between outside directors or board composition and firm performance, as measured by market-to-book value (MB), the price/earnings (PER = SP/EPS) ratio, operating margin, return on assets (RoA), sales per employee, ratio of cash flows to assets, and ratio of cash flows to sales (Cho & Rui, 2009; Hermalin and Weisbach, 1991; Agrawal and Knoeber, 1996; and Bhagat and Black, 1999).

It is assumed that the governance institutions implement effective supervisory functions well, it will increase investors' trust in the company's CG and its operations because of increased earnings. The ultimate test of earnings quality is the market's response to earnings (PER), which provides a measure of the extent to which new earnings information is capitalized in the stock price (Kim and Kross 2005; Ryan and Zarowin 2003). Holthausen and Verrecchia (1988) documented a positive association between the magnitude of stock price responses and the precision of accounting information. Yang and Krishnan (2005) used the unexpected annual earnings scaled by stock prices at the end of the year to control the incentives. Burgstahler and Eames (2002) and Abarbanell and Lehavy (2003) suggested that earnings may also be managed to meet simple earnings expectations in the stock market. Teoh and Wong (1993) and Balsam et al. (2003) suggested that investors' responses to an earnings surprise depend on the perceived quality and credibility of the earnings reported. Specifically, Teoh and Wong (1993) hypothesized that investors perceive Big Eight auditors as providing higher quality audits. Examples of this include the reaction of the stock market toward unanticipated income reports of Big Eight clients. Thus, by

linking financial reporting results to PERs, they provide evidence that the financial statements audited by the Big Eight clients are of higher quality and utility. Their study revealed that a higher stock pledge of supervisors and directors results in lower fluctuation in the stock price and they studied the relationship between stock price and the effectiveness of the company's operation, revealing a positive correlation between them. Jones (1991), Cahan (1992), Han and Wang (1998), and Yang and Krishnan (2005) used the natural logarithm of a firm's market value of equity as the proxy variable for political costs, because their studies assumed that managers of politically sensitive firms may manage earnings to minimize their political or regulatory scrutiny. The foregoing discussion illustrates that many studies have used an earnings-based measure as a proxy variable. The market's response to earnings (PER) is likely to vary with the stockholders' perceptions of supervisory institutions' effectiveness.

In summary, prior studies have advanced reasons for firm performance (PER=SP/EPS) to be affected by board composition (independence and expertise) and diligence of size intensity of activity. This literature, however, has not directly assessed whether these effects also would hold for the listed Chinese companies operating within the China institutional context.

**Audit Committees' Characteristics Related to Effectiveness**

Subsequent to the passage of the Sarbanes-Oxley Act, AC research continued to concentrate on examining the relationship between the three AC characteristics (independence, expertise, and activity) and AC effectiveness (Carcelle and Neal 2000; Klein 2002b). A plethora of studies concerning AC effectiveness concentrate on the role played by ACs' mandated characteristics. In the U.S. the AC is a sub-committee of the BoD; and confines the definition mainly to the composition and the key responsibilities of ACs (See US Securities Exchange Act of 1934 #10 (m)(3); SOX Section 404, 2002). All definitions of the AC tend to emphasize two attributes of its composition, namely independence and financial expertise, as well as its responsibility or operations of activities.

**Independence**

The Chinese Company Act states that an SB comprises employee supervisors and stakeholder supervisors. It is difficult for employee supervisors to be independent in carrying out their supervisory obligations because they themselves are subject to the company's administrative hierarchy, and their wages and positions are determined by the management. The Company Act provides no administrative protection against this threat, and so this lack of independence is assumed to impact the effectiveness of SBs. This assumption will be examined for the attribute of independence according to the studies of Beasley (1996), Abbott et al. (2004), Klein (2002a), Klein (2002b), Carcello and Neal (2003), Xie et al. (2003), Bedard et al. (2004).

The Blue Ribbon Committee (BRC) (1999: 22) noted that "several recent studies have produced a correlation between AC independence and two desirable outcomes: a higher degree of active oversight and a lower incidence of financial statement fraud." This statement indicates that more independent ACs could exercise better oversight of the quality of financial reporting. Any serious regulatory attempt should have specific requirements related to these factors, and different levels of regulatory requirements may result in different levels of supervisory performance. According to the requirements of the Charter of the AC across the American, British, and Chinese Systems (CSRC 2001, CSRC and SEC 2002, FRC 2008, FRC 2010, and SOX 2002), the Anglo-American model requires all members of the AC to be independent directors, while the Chinese model requires only half of the members to be independent directors. According to the U.K., U.S., and China's regulations, the independent directors must not receive fees for consultation or reward; must not participate in share holding; must not have any affiliations of significant relationship with the company by participating in any related transaction with the company or its subsidiaries; must not work for the company or its subsidiaries in the current year or have in the past three years acted as an identified title or function, such as being a partner, executive, or the creator of financial statements.

The following related studies support the contention that an AC's independence can increase the company's value and strengthen the quality of financial reporting and the effects of earnings management (Beasley 1996; Klein 2002a; Klein 2002b; Carcello and Neal 2003; Xie et al. 2003; Abbott et al. 2004; Bedard et al. 2004). *The findings of all these related studies empirically support a positive correlation between the AC's independence and its effectiveness in executing supervisory functions.* All studies conclude that higher levels of independence increase the shareholders' and stakeholders' trust in CG.

### Expertise

Although Chinese guidelines discuss the need for supervisors to have professional knowledge or work experience in areas such as law and accounting (Code of CG for Listed Companies in China), it is not yet a mandatory

requirement. That said, at least one member of a Chinese AC must have expertise in accounting, and at least one member must have recent and relevant financial experience in the U.S. and U.K.

A deficiency that could lead to ineffectiveness in China's SBs is the absence of a clear-cut requirement for the expertise of board members. Although there are a few brief comments in the Code of CG for Listed Companies in China stating that the members should have expertise in law and accounting, the legal status of that code has to date not been established, and it therefore does not constitute an enforceable mandate. Therefore, there is no guarantee that an SB has in its membership the basic expertise for the fulfilment of its roles. It could even be assumed that SB membership is essentially an honorary title with no effective function in practice. Therefore, levels of expertise relating to Chinese SBs' effectiveness must be closely examined. In this study, the financial, legal, and internal audit expertise of SBs will be defined as the independent variables for evaluating the effectiveness of supervisory functions. The attribute of expertise is referenced in the studies of DeZoort and Salterio (2001); Abbotte et al. (2000); Abbotte et al. (2003); Xie et al. (2003); Abbott et al. (2004); Bedard et al. (2004); Defond et al. (2005). The emphasis on AC members' expertise in regulation *and the research results from academic studies empirically support a positive correlation between an AC's financial expertise and its effectiveness in executing its supervisory function.* These studies support the view that higher levels of *financial expertise lead to greater ability to prevent earnings management, and higher levels of professional expertise increase shareholders' and stakeholders' trust, reflected in, for example, a positive stock market reaction.*

### Activities

(1) Size (ACT1#): Under the Company Act, the minimum number of members of an SB is three, and there is no maximum limit. In comparison, in Germany and Austria, the range is 3–20 members, and in France, 3–12. The actual number is determined by the company rather than the General Meetings of Shareholders in accordance with the company's volume of its shares, the number of employees, and the relationship between investors and managers, as specified in its constitution. Encouraged by the BRC and the accounting profession (IIA 1991), the SEC (1999) mandated that ACs consist of a minimum of three directors. In China, the Code of CG for Listed Companies mandates at least three members in ACs, but its actual practice is still questionable. The statistics for the size of SBs and ACs across China are therefore reserved for future research. The size of supervisory institutions is referenced from Yermak (1996), Eisenberg et al. (1998), SEC (1999), and Xie et al. (2003). The numbers of members of SBs and BoDs are also treated as variables reflecting the level of diligence, which can affect the supervisory function effectiveness. The size of the supervisory institutions will be defined as the independent

variable hypothesizing a positive correlation. The size of the supervisory institutions will be defined as the independent variable for evaluating supervisory functions' performance and operations hypothesizing a positive correlation.

(2) Annual Number of Meetings (ACT2# & ACT3#): Section 56 of the Chinese Company Act stipulates that the SB has to hold at least one meeting annually. The Treadway Commission recommended in "The Good Practice Guidelines for ACs" in 1987 that ACs should hold a minimum of three or four meetings a year and special meetings when necessary (IIA 1991; Price Waterhouse 1993). Meeting frequency has been noted as a measure of an AC's due diligence. The international norm is that ACs must hold at least three or four meetings annually. The meeting frequency has been noted as a measure of due diligence in executing the supervisory functions. The annual number of meetings of the SB and BoD is defined as the independent variable for evaluating the effectiveness of supervisory functions, with reference to the studies of McMullen and Raghunandan (1996), Abbott et al. (2000), DeZoort et al. (2002), Xie et al. (2003), and Abbott et al. (2004). The number of meetings including both those specified in the charter and those actually taken in practice can be used to gauge the level of diligence. In practice, the various companies may hold different numbers of meetings year on year. The supervisory institutions' due diligence is assumed to positively affect their supervisory function effectiveness.

### Hypotheses Development

Cho and Rui (2009) reported that the similarities between the responsibilities and authority accorded to Chinese firms' internal governance mechanisms and their Western counterparts, it is not unreasonable to expect that they would have similar effective performance. Therefore, this study applies accepted research concepts to define market response to earnings (PER or P/E) of the firm as the dependent variable, and assumes that the firm's better PER will reflect better effective performance of its supervisory functions. PER or P/E is an important indicator of listed companies' earning ability by reflecting investors' willingness to pay the price per dollar of net earnings. Therefore, it is assumed that firms' PER and supervisory function performance have a positive correlation.

After prior studies of AC's characteristics, consequently, four measures will be applied for examining the independence of supervisory functions performed by China's with and without AC systems. (1) Independent directors' percentage (IND1%): A positive relationship is expected to exist because firms with more independent directors over the board perform more effective supervisory functions. (2) Percentage of shareholdings by supervisors (IND2%): A negative relationship is anticipated because it is assumed that a higher percentage of shareholding supervisors will cause lower independence of SBs and a negative effect on supervisory functions' effectiveness. (3)

& (4) Number of supervisors and directors receiving remunerations (IND3# and IND4#, respectively). A negative correlation is expected between the number of supervisors and directors receiving remuneration or rewards, respectively, and the effectiveness of supervisory functions.

According to China's regulations, at least one expert with financial or accounting background and legal background is required. Although prior literatures provide credible attempts to examine the boundaries of AC effectiveness, a need to look beyond these boundaries remains. In practice, there have been three old and three new institutions<sup>1</sup> in the Chinese system. The new institutions include the General Assembly Meeting, the BoD, and the SB, while the old institutions in State Own Entities (SOEs) include the Party Officers' Committee, the Union and the Stakeholders' Representatives' Committee. Therefore, the SB is composed of stockholders and employees and directly elected by stockholders and employees. The SB's members interact with new and old institutions. Now, the problem of bridging the old and new institutions arises. The elected SB representatives are responsible to the stockholders and stakeholders; they are supposed to take their responsibilities seriously even though there is no required financial or legal professional accountable for these responsibilities. It is mandatory that the SB perform its supervisory function once they are elected even though they may not have the required professional background. Therefore, the question has been raised as to whether the elected SB member is a party member employee without the required professional expertise to effectively perform the supervisory function. Internal auditors with special skills in specific operations may be transferred from other departments, but without a financial or accounting background. The internal audit without experts from a financial or accounting profession is defined as one single variable in this paper to differentiate it from the audit experience defined in the regulation of the SEC, Disclosure Required by Sections 406 and 407 of the Sarbanes-Oxley Act of 2002. This study will also consider internal audit literacy and party member employee as independent variables of expertise. A positive correlation is anticipated; that is, a higher number of experts with an accounting, financial, legal, or internal audit background will lead to more effective supervisory function performance. In contrast, party-member employees with no expertise related to accounting or a financial, legal, or internal audit background are assumed to have a negative correlation with effective supervisory functions. Four expert variables are as follows: *EXP1%*, *EXP2%*, *EXP3%*, and *EXP4%*.

The size of the supervisory institutions will be defined as the independent variable for evaluating supervisory

<sup>1</sup> Three old and three new institutions: Shortly after the foundation of the People's Republic of China in 1949, the supervisory profession in China nearly disappeared. Independent monitoring was virtually nonexistent under the planned economy before the 1980s, when the state both owned and ran enterprises. The re-emergence of independent supervision resulted from the increasing Sino-foreign joint ventures encouraged by China's open door policy, adopted in the early 1980s. Under China's open door policy, in order to cope with the international practice, the new three institutions were established to replace the old three institutions (Lu, 1994).

functions' performance and operations hypothesizing a positive correlation. This study will use the number of meetings of supervisory institutions as independent variables for their operational diligence in carrying out their supervisory functions, thus hypothesizing a positive correlation.

Meanwhile, this study will applied the following four measures as the control variables. Titman and Wessels (1988) used the total assets increased percentage to evaluate the growth rate (GR%); Bedard et al. (2004) also used the total asset increase rate as a proxy control variable and applied

(RoA%) as a control variable to measure abnormal accruals and/or AC characteristics. Yang and Krishnan (2005) asserted that major agent problems between stockholders and creditors are caused by debt. Accordingly, the debt-monitoring hypothesis (Gul and Tsui 1998, 2001) asserted that a higher percentage of debt would lead to more stringent supervisory roles created by the creditors. Gul and Tsui (1998, 2001) and Bedard et al. (2004) applied the natural logarithm of the assets as the control variable of firm size. Becker et al. (1998) and Lee and Chen (2004) noted that the firm size may represent many omitted variables.

**Table 2.** The Definition of Variables, Measures and Expected Sign. (Source: Author)

	Code	Measured Method	Relationship Assumption – Expected Sign (Direction)
Dependant Variable			
Market response to earnings	PER	The formula of market response to earnings = stock price of per common share /earnings per share (EPS).	+ (positive)
Independent Variables			
Independent Directors' Percentage	(1) IND1%	The total number f independent directors by the size of the BoD	+ (positive)
The percentage of shareholdings by the supervisors of the SBs.	(2) IND2%	The shareholdings by the supervisors, divided by the total shareholding	- (negative)
The number of the supervisors and directors receiving remunerations or rewards respectively	(3) IND3# (4) IND4#	The number of the supervisors and directors receiving remunerations or rewards respectively	- (negative)
Expert with Financial or Accounting background; Legal background; Internal Audit background and Party-Member Employee	(5) EXP1% (Financial or Accounting) (6) EXP2% (Legal) (7) EXP3% (Internal Audit) (8) EXP4% (Party-Member Employee)	The number of EXP1, 2, 3 and 4 / the size of SBs	EXP1 + (positive) EXP2 + (positive) EXP3 + (positive) EXP4 – (negative)
The number of SB supervisors	(9) NUM1#	The size of the SBs	+ (positive)
The annual number of meeting times of SB and BoD respectively	(10) MT1# (11) MT2#	The meeting times of SB and BoD (proxy variable of AC) respectively	+ (positive)
Control variables			
Debt Equity	(14) DEBT %	Total Liability /(divided by) Total Equity	- (negative)
Growth Rate	(15) GR%	by evaluating the total asset's growth rate = $TA(t) - TA(t-1) / TA(t-1)$	+ (positive)
Return on Asset	(16) RoA%	The RoA is measured by the percentage of net income by average total asset. The formula is calculated = (Net income / average total asset) * 100%, Average total asset=(beginning balance + ending balance of total asset)/2 .	+ (positive)
Firm Size	(17) Ln <sub>(Asset)</sub>	Ln <sub>(Asset)</sub> : the natural logarithm of the assets as the proxy variable of firm size	- (negative)

Table 2 shows the definition of Variables, Measures and Expected Sign for the variables used in hypothesis development.

Among the Chinese listed companies surveyed in 2010, 99.86% indicate their willingness to set up an AC and an SB simultaneously. Hansmann and Kraakman (2001) asserted that the CG model used in both the US and the UK focusing on shareholders' benefit is most effective, and referred to this Anglo-American model as the standard for CG. The findings of Governance Metrics International (GMI), an international management appraisal organization that evaluated companies in 38 countries, seem to confirm this viewpoint. Several countries with similar CG models, such as the UK, the US, Canada, Australia, and New Zealand, have been consistently ranked high on the GMI rankings, and occupied the top six places in the 2007 ranking (GMI 2007). Therefore, in order to answer the key research question, the following hypothesis, stated formulaically, is formed:

**SBs with ACs (G2(With AC)) are more effective than SBs alone (G1(Without AC)):**

$$HI := \alpha_2 - \alpha_1 > 0 \quad (1)$$

H1: Effectiveness is higher for listed Chinese firms with ACs having higher independent directors' percentage, lower percentage of shareholdings by the supervisors of the SBs, less number of the supervisors and directors receiving remunerations or rewards, more number of expert with financial or accounting background, legal background, internal audit background, less number of party-member employee, more number of SB supervisors, more frequent meetings of SB and BoD respectively.

The independence, activity and expertise with 11 variables measure supervisory characteristics and constitute this test variables; the others 4 control variables for omitted variables in market response to earnings (PER) as the proxy dependent variables on the effectiveness of supervisory functions.

### 3. Methodology

#### Design

Comparing the two simultaneously existing supervisory systems for listed companies in China, those having only SBs (G1 (Without ACs)) and those having SBs and ACs (G2 (With ACs)), will reveal which system is more effective. The Panel Data Regression Model is applied to examine the independent variables representing the characteristics and activities of supervisory functions to the dependent variable of market response to earnings (PER). If the test result shows that the estimated coefficients of G2 are better than G1 and p value are positive and statistically significant across the sample years, it suggests that investors positively recognize ACs' contribution to the effectiveness in developing the monitoring function for the company. The more effective system will emerge from a comparison between the two groups of the sample targets to answer the research question and prove or disprove the hypothesis. Meanwhile, the purpose of the significance test is to examine the relationship between the dependent variable (PER) as a proxy for the effectiveness of internal supervisory functions and individual independent variables.

#### Empirical Model

Models 1 and 2 are designed to examine the relationship between market response to earnings (PER) and governance characteristics by estimating the coefficients in the following multinomial linear regression of panel data model.

##### Model 1: independence, activity, and control variables

$$PER = \beta_0 + \beta_1 IND1\% + \beta_2 IND2\% + \beta_3 IND3\# + \beta_4 IND4\# + \beta_5 ACT1\# + \beta_6 ACT2\# + \beta_7 ACT3\# + \beta_8 DEBT\% + \beta_9 GR\% + \beta_{10} RoA\% + \beta_{11} Ln(Asset) + \varepsilon$$

##### Model 2: expertise and control variables

$$PER = \beta_0 + \beta_1 EXP1\% + \beta_2 EXP2\% + \beta_3 EXP3\% + \beta_4 EXP4\% + \beta_5 DEBT\% + \beta_6 GR\% + \beta_7 RoA\% + \beta_8 Ln(Asset) + \varepsilon$$

where:

PER= Market response to earnings. The formula of market response to earnings = stock price of per common share /earnings per share (EPS).

IND1%= Independent Directors' Percentage. The total number of independent directors/ the size of the BoD

IND2%= The percentage of shareholdings by the supervisors of the SBs. The shareholdings by the supervisors /divided by the total shareholding

IND3#= The number of the supervisors receiving remunerations or rewards respectively.

IND4#= The number of the directors receiving remunerations or rewards respectively.

EXP1%= The number of the expert with Financial or Accounting background divided by the size of SBs

EXP2%= The number of the expert with Legal background divided by the size of SBs.

EXP3%= The number of the expert with Internal Audit background divided by the size of SBs.

EXP4%= The number of the expert with Party-Member Employee divided by the size of SBs.

NUM1#= The number of SB supervisors (The size of the SBs)

MT1#= The annual number of meeting times of SB

MT2#= The meeting times of BoD

DEBT %= Total Liability /(divided by) Total Equity

GR = Growth rate, Total asset (t)-Total asset (t-1)/ Total asset (t-1),

RoA%= The proportion of net income/ over average total assets,

$\ln(\text{Asset})$  = The natural logarithm of the assets as the proxy variable of firm size,

Models 1 and 2 are used because the data are retrieved from different sources, the CCER database and financial statements, respectively, and so have different sample size. The independence and activity data are retrieved from the CCER database as sample 1 to fit into the Model 1 regression; the expertise data are retrieved from the financial statements as sample 2 to fit into the Model 2 regression.

The research data for testing the hypothesis span sectors and time sequences for the period 2005–2007. To resolve the possible problems related to correlation in analyzing time series, the panel data model has been chosen because it can analyze the data with cross sections and time series at the same time, decreasing the likelihood of problems of autocorrelation of the variables, as well as possible problems of heteroskedasticity of the samples in cross sections. Panel data are particularly suitable for capturing more information and improving the efficiency of the estimated value. Since the data were pooled over a three year period, it is used the fixed effects panel data analysis method to test for temporal instability in the regression coefficients for these two designed models.

### Sample Selection

The research sample will focus on China. In October 2002, China enacted the Practical Regulations for CG for Listed and Over-the-Counter Companies. To exercise some control over extraneous factors, the sample was selected from listed Chinese companies under the General Industry classification. Thus, companies belonging to, for example, the finance industry were excluded. It is focused on 2005 through 2007. The rationale for applying data from 2005 to 2007, because China's security market was established only in December 1990, therefore its rules and policies are not yet well established, the accumulated problems in the capital market, such as the lack of system and structure, begin to appear, and when the market enters an adjustment period, the difficulty is increased for new stock releases and existing stock refinancing. Meanwhile, SOE (A) shares occupied the share market of over 91% in China between 2003 and 2009 (CSRC (2002)); B shares of listed companies (Available for foreign investors only) represent less than 10% in the Chinese security market at present. Normally governments are the controlling owners or parent SOEs that owned shares that are not tradable. Therefore, the preceding discussion suggests that whether a firm introduces an AC to serve a CG function is controversial, depending on the potential costs and benefits to the controlling owner. The controlling owner may be inhibited in their ability to maximise self-interest through benefit transfer because of high standard monitoring by the AC. In general, the more concentrated the ownership structure, the weaker the internal supervisory mechanism; hence, there will be more opaqueness gains for the controlling shareholders.

Since 2005, the appointment of independent directors became compulsory for listed companies to improve the internal supervisory mechanism in China. Meanwhile, stockholders' rights of SOE(A) shares were divided into tradable and non-tradable two parts during the same year. An SOE share can be further divided into four types: shares owned by central or local governments; employees; individuals; and institutions, SOE shares cannot be tradable; the other three types have been permitted for tradable. Apparently, 2005 is a watershed year in stockholder right's reform from non-tradable to tradable led China into regarding the monitoring system of CG as more important. Therefore, this study collects the data since 2005. And also, to prevent periodic earnings deviations of the industries or the corporations, the value should not use only one year's earnings. In this study, at least three years' statistics are used to avoid deviation since 2005 to 2007. Meanwhile, it is based on the statistics of Chinese Companies Introducing ACs between 2000 and 2010 (Table 1) report that since 2008, 99% companies with ACs (G2) and only 10% companies without ACs (G1). Therefore, the data is collected unit 2007 in order to balance two groups for comparison.

This paper uses the comparisons between two groups of all of the listed companies with and without setting up ACs as of 2007. There are two systems of oversight included in the text, namely the one with SBs alone (G1: without ACs) and the one with both SBs and ACs (G2: with ACs). This study will select the sample firms from listed Chinese firms by the listed companies with and without ACs in two groups. The first group consists of companies without ACs and the second group consists of companies with ACs. The numbers of General Industry listed companies in these three years are 1351, 1434, and 1545, and the firms with ACs are 641, 640 and 635 respectively.

Sample 1: The independence and activity data is retrieved from Chinese Center of Economic Research (CCER) database. Firms were selected from this set based on the following criteria:

- (1) Annual earnings, book value, debts and share information are available on the China Corporation and Economic Research (CCER) financial statement database;
- (2) Daily security prices and factors to adjust for stock splits and dividends are available on the CCER transaction database;
- (3) Total assets are non-negative.

Sample 2 is created because no data of expertise is recorded in the CCER database. The level of expertise is randomly retrieved from financial statements from the websites of SSE with 100 listed companies' financial statements from 2005 to 2007. The overall figure for Group 2 of companies with ACs is 44% in Sample 2. This fits with the average percentage of 44% of those setting up ACs between 2005 and 2007, namely 47%, 45% and 41%, respectively. Sample 2 is presented in the

table 3: SB Members' Expertise and Party Status.

**Table 3.** SB Members' Expertise and Party Status

	Number of expertise	Average (2005-2007)		2007		2006		2005	
		(*)	No.	%	No.	%	No.	%	No.
Companies having SB members with financial or accounting expertise	0	40	44.33%	38	42%	41	45%	40	46%
	1	34	38.00%	35	39%	35	39%	31	36%
	2	12	13.67%	15	16%	10	11%	12	14%
	3	3	3.00%	3	3%	4	4%	2	2%
	4	1	1.00%	0	0%	1	1%	2	2%
Total		90	100.00%	91	100%	91	100%	87	100%
Companies having SB members with legal expertise	0	78	87.33%	77	85%	79	87%	78	90%
	1	11	11.67%	14	15%	11	12%	7	8%
	2	1	1.00%	0	0%	1	1%	2	2%
Total		90	100.00%	91	100%	91	100%	87	100%
Companies having SB members with auditing expertise (*)	0	72	80.33%	76	84%	70	77%	70	80%
	1	14	16.00%	13	14%	17	19%	13	15%
	2	3	3.67%	2	2%	4	4%	4	5%
Total		90	100.00%	91	100%	91	100%	87	100%
Companies having SB members with party connections and without accounting, financial, legal or auditing expertise.	0	55	62.00%	58	64%	57	63%	51	59%
	1	24	27.00%	24	26%	23	25%	26	30%
	2	7	8.00%	5	6%	8	9%	8	9%
	3	3	2.67%	3	3%	3	3%	2	2%
	4	0	0.33%	1	1%	0	0%	0	0%
Total		90	100.00%	91	100%	91	100%	87	100%
Companies having SB members with accounting, financial and legal expertise at the same time.		8	9.00%	9	10%	7	8%	7	9%

(Source: Author, sample 100 listed companies, as supported by data from yearly financial statements retrieved from the websites of Shanghai Stock Exchange and Shenzhen Stock Exchange)

\*1: The data excludes 2 banking companies, and 7 companies whose records were unclear regarding the SB members' expertise in 2005, 2006 and 2007. Therefore, the effective sample is 91 companies in 2006 and 2007. 4 companies were listed since 2006 and 2005 financial statements were unavailable, meaning 87 companies' data is presented for 2005.

\*2: Expertise is defined as having audit skill and experience in the audit process. Experience of external auditing and a background of financial and accounting expertise has been counted in the item of the financial and accounting expertise.

### Industry Types

Table 4 reports industry statistics of research samples. The samples are categorized according to the CCER database, the CSRC definition is described, and the sample industries in this study are listed. The two samples include nearly every category of industry, except finance and insurance, whose requirements for supervisory functions are stricter than those of the others because these two industries are fully or at least strongly reliant upon public's trust. In this study, the manufacturing industry (code C) covers over 50% of the sample companies in both groups of Samples 1-2, paralleling industry allocation in China.

This selection process by the multiple linear regressions for the Shanghai and Shenzhen stock exchanges (SSE) control for the effects of extreme values, It is removed observations that are (1) in the top and bottom one-half percent of P/E, (2) in the top one-half percent of firms with the most extreme values of one-time items as a percent of income, and (3) identified as extreme outliers in the regression. This process yielded a final sample 1 of 2148 and 1873, sample 2 of 140 and 115 firm-year observations, which were used in all of the hypothesis tests. More details about characteristics of the sample are reported along with the hypothesis testing results.

**Table 4.** Industry Statistics of Research Samples (Source: Author, as supported by CCER data base)

CSRC Code *	S1:G1 No.# of listed co.	S1:G2: No.# of listed co.	S2:G1 No.# of listed co.	S2:G2: No.# of listed co.
A	25	13	3	0
B	19	11	0	0
C	529	353	33	22
D	31	31	0	1
E	20	13	0	3
F	33	34	3	1
G	57	39	2	3
H	46	46	0	2
J	34	29	3	0
K	24	22	0	0
L	9	5	0	0
M	19	1	0	0
Z	45	27	6	6
Total	891	624	50	40

\* There are 13 industry categories for the listed companies:

- A: Agriculture, forestry, animal husbandry, fishery  
(Sample 1: 1); (Sample 2: G1: 25; G2: 13); (Sample 3: G1: 3; G2:0);
- B: Mining industry (1; 1); (19; 11); (0; 0);
- C: Manufacturing (7; 7); (529; 353); (33; 22);
- D: Electricity, gas, and water production and provision (6; 6); (31; 31); (0; 1);
- E: Building trade (0; 0); (20; 13); (0; 3);
- F: Transportation and storage (6; 6); (33; 34); (3; 1);
- G: Information skill (2; 2); (57; 39); (2; 3);
- H: Wholesale and retail trade (6; 6); (46; 46); (0; 2);
- I: Finance and Insurance (0; 0; 0);
- J: Real estate (5; 5); (34; 29); (3; 0);
- K: Social service (5; 5); (24; 22); (0; 0);
- L: Advertising and culture industry (1; 1); (9; 5); (0; 0);
- M: Others (3; 3); (19; 1); (0; 0);
- Z: No Associated (0; 0); (45; 27); (4; 4)

**Table 5.** Sample 1 Descriptive Statistics (Source: Author)

G1&G2	PER1	IND 1	IND2	IND3	IND4	ACT1	ACT2	ACT3	DEBT %	GR%	ROA%	Ln <sub>(Asset)</sub>
		DIR %	SBSH %	SBRE#	DIRRE #	SBNUM #	SBMIT #	BoDMIT #				
Expected Sign	+	+	-	-	-	+	+	+	-	+	+	-
Mean1 (G1)	83.77	0.35	0	0.71	6.27	4.05	3.81	8.03	1.81	0.16	0.02	21.25
Mean2 (G2)	78.04	0.35	0	0.68	6.25	4.22	4.01	8.24	0.32	0.15	0.03	21.4
Median1 (G1)	37.12	0.33	0	0	6	3	4	8	1.1	0.07	0.03	21.19
Median2 (G2)	35.19	0.33	0	0	6	4	4	8	1.13	0.08	0.03	21.33
No. of Obv.1	2148	2145	2148	2148	2148	2148	2148	2148	2148	2148	2148	2148
No. of Obv.2	1873	1873	1873	1873	1873	1873	1873	1873	1873	1873	1873	1873

## Hypotheses Tests

### Sample Descriptive Statistics

Table 5: Sample 1 Descriptive Statistics; and Table 6: Sample 2 Descriptive Statistics, report data on SB and BoD

descriptive statistics composed from the two samples, respectively. Both Samples 1 and 2 are retrieved from 2005 to 2007, with three years' statistics. Sample 1 is generated by dividing all the listed companies in Group 1 (G1: SBs alone) and Group 2 (G2: with AC). Group 1's 891 companies had SBs without ACs, while Group 2's 624 companies had both SBs and ACs. The sample size of Group 1 without ACs is little larger than Group 2's, with 59% and 41%, respectively, in 2007. Group 2's size is 47%, 45%, and 41% in 2005, 2006, and 2007, respectively.

Market response to the earnings (PER) is used as an effectiveness measure is based on an extensive prior literature (McConnell and Servaes, 1990; Stulz, 1988).; Chung and Pruitt 1994; Stulz, 1988); the stock price (Kim and Kross 2005; Ryan and Zarowin 2003, Holthausen and Verrecchia 1988) and the earning per share (James 2005, Kim and Kross 2005, Palepu, Bernard and Healy 1997). Table 5-6 show descriptive statistics for the variables used in hypothesis testing. The sample firms have a mean of PER1 and PER2 are TWD 83.77 and 78.04 for sample 1 and TWD 73.03 and 71.23 for sample 2. The median of PER1 and PER2 37.12 and 35.19 for sample 1 and 34.62 and 40.38. (US\$1=TWD 29.9, approximately.)

**Table 6.** Sample 2 Descriptive Statistics (Source: Author)

G1&G2	PER2	EXP1 FIN%	EXP2 LEG%	EXP3 IA%	EXP4 PARTY%	DEBT%	GR%	RoA%	Ln(Asset)
Mean1	73.03	0.22	0.04	0.03	0.16	2.94	0.27	0.02	21.29
Mean2	71.23	0.19	0.03	0.10	0.11	3.46	0.17	0.02	21.61
Median1	34.62	0.20	0.00	0.00	0.00	1.28	0.08	0.03	21.30
Median2	40.38	0.20	0.00	0.00	0.00	1.22	0.08	0.02	21.45
No. of Observation1	140	140	140	140	140	140	140	140	140
No. of Observation2	115	115	115	115	115	115	115	115	115

The mean and median are used as the parameters to describe the central position of the statistical data in reviewing the trend of centralization. Tables 5 and 6 report the centralization trends in both groups of the two samples have no deviation for comparison in this study.

**Correlation Coefficient Analysis**

The correlations coefficient test among the identified variables demonstrates the tolerance between two variables. This study investigates the correlation degree rather than a positive or negative direction, and so the absolute value is considered as follows: a higher coefficient means a closer correlation between two variables, whereas a lower coefficient suggests a weak correlation between two variables. If the coefficient's absolute value is less than 0.3, it indicates a low correlation; a value between 0.4 and 0.7 indicates medium correlation; a value between 0.7 and 0.8 indicates high correlation; and a value above 0.8 indicates extremely high correlation. Where the correlation coefficient modulus (absolute value) is greater than 0.8, it suggests a strong linear relationship and may have a harmful linear correlation (Tsai 2006).

Table 7-8 present the correlations among the variables, with Pearson correlations under the diagonal and Spearman correlations above the diagonal. Most are small in absolute value. All of the variables present less than 0.4 with low correlation. Though, growth rate (GR2) of sample 2 is 0.37 correlated with RoA2 and expertise with accounting and financial literacy (EXP1) is 0.31 correlated with expertise with internal audit experience (EXP3%), both of 0.37 and 0.31 are over 3 but still less than 0.4. Overall, no value in both groups is larger than 0.8. This result does not generate a co-linear problem. There is, therefore, no need to delete any variable presented in Table 7-8: Sample 1 & 2 Correlations among Possible Correlated Variables.

Table 7. Sample 1 Correlations among Possible Correlated Variables (Source: Author)

S1G1	PER1	IND1DIR%	IND2SBSH%	IND3SBRE#	IND4DIRRE#	ACT1SBNUM#	ACT2SBMIT#	ACT3BoDMIT#	DEBT%	GR%	RoA%	Ln(asset)
per1	1.0000											
ind1	0.0175	1.0000										
ind2sbsh	-0.0169	0.0155	1.0000									
ind3sbre	-0.0317	-0.0193	0.0945	1.0000								
ind4dirre	-0.0145	-0.0860	0.0297	0.0981	1.0000							
num1sbsize	-0.0519	-0.0878	-0.0448	0.1976	0.1438	1.0000						
mt1sb	0.0847	0.0215	-0.0220	-0.0201	0.0089	0.0418	1.0000					
mt2bod	0.0401	0.0063	-0.0395	-0.0063	0.0215	-0.0264	0.2788	1.0000				
debt1	0.0203	0.0056	-0.0044	0.0121	0.0057	-0.0019	-0.0053	-0.0296	1.0000			
gr1	-0.0069	-0.0131	0.0085	-0.0170	-0.0025	-0.0001	0.0614	0.0304	0.0058	1.0000		
roa1	0.0005	-0.1095	0.0124	-0.0063	0.0080	0.0409	0.0315	0.0372	-0.0034	0.0614	1.0000	
Ln(asset)1	-0.0526	-0.0313	0.0172	0.1582	0.0894	0.0868	0.0932	0.0556	0.0049	0.1868	-0.0116	1.0000
S1G2	PER2	IND1DIR%	IND2SBSH%	IND3SBRE#	IND4DIRRE#	ACT1SBNUM#	ACT2SBMIT#	ACT3BoDMIT#	DEBT%	GR%	RoA%	Ln(asset)
per2	1.0000											
ind1	0.0562	1.0000										
ind2sbsh	-0.0221	-0.0218	1.0000									
ind3sbre	-0.0567	-0.0155	0.1395	1.0000								
ind4dirre	-0.0676	-0.0727	0.0519	0.0691	1.0000							
num1sbsize	-0.0472	-0.1327	-0.0343	0.1017	0.0592	1.0000						
mt1sb	0.0301	0.0209	-0.0504	-0.0512	-0.0942	0.0297	1.0000					
mt2bod	0.0202	-0.0478	-0.0166	-0.0326	-0.0214	-0.0359	0.2598	1.0000				
debt2	0.0120	0.0029	0.0029	-0.0093	-0.0252	0.0239	0.0265	-0.0050	1.0000			
gr2	-0.0219	-0.0550	0.0301	-0.0257	-0.0352	0.0386	0.0858	0.1154	0.0194	1.0000		
roa2	-0.0050	-0.0240	0.0248	0.0145	-0.0370	0.0417	0.0836	0.0206	0.0279	0.1932	1.0000	
Ln(asset)2	-0.1141	-0.1217	-0.0583	0.0826	0.0457	0.1852	0.0920	0.1308	0.0242	0.2477	0.1228	1.0000

**Table 8.** Sample 2 Correlations among Possible Correlated Variables (Source: Author)

S2G1/G2	PER1	EXP1 FIN% 1	EXP2 LEG% 1	EXP3 IA% 1	EXP4 PARTY% 1	DEBT %1	GR %1	RoA %1	Ln <sub>(Asset)</sub> 1	PER2	EXP1 FIN% 2	EXP2 LEG% 2	EXP3 IA% 2	EXP4 PARTY% 2	DEBT %2	GR %2	RoA %2	Ln <sub>(Asset)</sub> 2
PER1	1.00									1.00								
EXP1FIN%	0.10	1.00								-0.12	1.00							
EXP2LEG%	0.03	0.24	1.00							0.15	-0.06	1.00						
EXP3IA%	-0.11	0.00	0.16	1.00						0.23	-0.31	0.05	1.00					
EXP4PARTY%	-0.16	0.02	-0.01	0.07	1.00					0.05	-0.30	-0.08	0.20	1.00				
DEBT%	-0.06	-0.10	-0.05	0.00	-0.06	1.00				-0.06	0.00	-0.03	-0.04	0.16	1.00			
GR%	0.00	0.16	-0.05	-0.06	0.04	-0.02	1.00			-0.14	0.13	-0.08	-0.04	-0.10	0.03	1.00		
RoA%	0.03	-0.06	-0.07	0.00	0.16	0.01	0.17	1.00		0.01	0.21	0.06	0.01	-0.08	-0.11	0.37	1.00	
Ln <sub>(Asset)</sub>	-0.17	-0.15	-0.13	0.07	0.46	-0.11	0.28	0.27	1.00	-0.20	0.07	0.20	0.07	0.01	-0.10	0.25	0.17	1.00

### Analysis for Test Results

- Comparing the coefficients of two systems

Table 9 presents “The Results of Two Empirical Models” (Sample 1 and Sample 2) to answer the research question. After comparing the coefficients of two systems with (G2) and without ACs (G1) in China, the test results present 12 of 15 independent and control variables are the same as the hypothesis including all of four independence; two expertise, two activity and four control variables. The other three variables of SBs’ meeting times, financial expertise and party member employees reveal G1 better than G2 contradict to hypothesis. Yet the contradict results also present the listed companies of G2 have more activities of meeting times and financial expertise on ACs and have less party member employee without financial, legal or internal audit expertise of SBs in G2. In another word, these three adverse results also prove the effectiveness of ACs in China.

**Table 9.** The Results of Two Empirical Models (Sample 1 and Sample 2) (Source: Author)

Sample 1: all listed co.		Group 1: SB only			Group 2: SB plus AC			G2-G1	Result
Variables	Exp Sign	P Value	Coef.1	G1:Sig.	P value	Coef.2	G2: Sig.	Coef2-Coef1	Better One
									G1/G2
(1)ind1%	+	0.834	14.18		0.139	111.65		97.47	G2
(2)ind2sbsh%	-	0.531	-395.4		0.445	-988.8		-593.4	G2
(3)ind3sbre	-	0.62	-2.23		0.144	-7.61		-5.38	G2
(4)Ind4dirre	-	0.917	-0.17		0.014	-3.93	**	-3.76	G2
(9)num1sbsize	+	0.048	-6.96	Reverse**	0.545	-2.06		4.9	G2
(10)mt1sb	+	0	11.45	***	0.269	3.21		-8.24	G1
(11)mt2bod	+	0.467	1.07		0.275	1.61		0.54	G2
(12)DEBT%	-	0.501	0.18		0.607	0.06		-0.12	G2
(13)ROA%	+	0.89	2.38		0.66	17.51		15.13	G2
(14)GR%	+	0.96	0.32		0.943	0.77		0.45	G2
(15)Ln <sub>(asset)</sub>	-	0.026	-10.21	**	0	-20.31	***	-10.1	G2
Sample 2: with expertise variables		Group 1: SB only (Without AC)			Group 2: SB plus AC (With AC)			Compare	Result
								G2-G1	Better One
Variables	Exp Sign	P Value	Coef.1	G1:Sig.	P Value	Coef.2	G2: Sig.	Coef2-Coef1	G1/G2
(5)exp1fin%	+	0.428	48.16		0.871	-8.63		-56.79	G1
(6)exp2leg%	+	0.851	-23.54		0.045	268.7	**	292.24	G2
(7)exp3ia%	+	0.454	-93.85		0.008	178.38	***	272.23	G2
(8)exp4party%	-	0.277	-71.47		0.98	1.7		73.17	G1
***, **, * Significant at 1 percent, 5 percent, and 10 percent levels, respectively, One-tailed where signs are predicted, two-tailed otherwise. See Table 2-3 for definition of the dependent and independent variables									

- Analysis of the significance of test results

After the test of Panel Data Analysis, 6 out of 15 independent variables show significant results, as summarized in Table 10 as follows:

**Table 10.** The Summary of Hypothesis and Test Result (Source: Author)

Hypothesis (H)	Better Group		Impact Significance	
(A) Independence (1-4) – Group 2 with ACs has more independence item 1-4 than group 1 without AC.	√ Ind4-indre-G2		G1	G2
The Test Result and Hypothesis	Hypothesis	Test Result (√ or X)	Positive (P) /Reverse(R)	Positive (P) /Reverse(R)
1. The higher of independent directors out of BoD will have higher market response to earnings (the proxy variable of effectiveness of supervisory functions).	G2			
2. The higher shareholding of SBs will have lower market response to earnings.	G2			
3. The more supervisors receive remunerations will have lower market response to earnings.	G2			
4. The more directors receive remunerations will have lower market response to earnings.	G2	G2 √		<b>P**</b>
(B) Expertise: Group 2 with ACs has more financial, legal and internal audit expertise but has lower of party-member employee supervisors without financial, legal and internal audit expertise than Group 1 without AC.	√ Leg-G2 √ IA-G2			
The Test Result and Hypothesis	Hypothesis	Test Result (√ or X)	Positive (P) /Reverse(R)	Positive (P) /Reverse(R)
5. The higher of financial expertise in SBs will have higher market value to earnings.	G2			
6. The higher of legal expertise in SBs will have higher market value to earnings.	G2	G2 √		<b>P**</b>
7. The higher of internal audit expertise in SBs will have higher market value to earnings.	G2	G2 √		<b>P**</b>
8. The higher of party-member employee without financial, legal or internal audit background in SBs will have lower market response to earnings.	G2			
(C) Activities Group 2 with ACs (AC) has more active operations of bigger size and more meeting times of SBs and more meeting times of BoD than Group 1 without AC.	(X) num1sbsize-G1 ( <b>R</b> ) (X) mt-sb-G1			
The Test Result and Hypothesis	Hypothesis	Test Result (√ or X)	Positive (P) /Reverse(R)	Positive (P) /Reverse(R)
9. The bigger size of SBs will have higher market response to earnings.	G2	G1 (R**)	<b>R**</b>	
10. The more active meeting times of SBs will have higher market response to earnings	G2	G1 (X)	<b>P***</b>	
11. The more active meeting times of BoD will have higher market response to earnings	G2			
(E) Control Variables The group 2 with ACs has better performance of supervisory function, so that to have lower debt rate, higher growth rate of total asset; higher rate of return on asset; and bigger firm size than group 1 without ACs.	√ Ln <sub>(Asset)</sub> -G2			
The Test Result and Hypothesis	Hypothesis	Test Result (√ or X)	Positive (P) /Reverse(R)	Positive (P) /Reverse(R)
12. The higher debt will have lower market response to earnings (DEBT)	G2			
13. The higher return on assets will have higher market response to earnings (ROA)	G2			
14. The higher growth rate of total assets will have higher market response to earnings (GR)	G2			
15. The bigger firm size will have lower market response to earnings. (Ln <sub>(Asset)</sub> )	G2	G2 √	<b>P**</b>	<b>P***</b>

Note: √ means support the hypothesis; (X) means conflict to the hypothesis.

■ (A) Independence

Four measures of independence are included to examine if G2 companies with ACs have:

- (1) Higher percentage of independent directors out of total board size;
- (2) Lower shareholding percentage of SBs;
- (3) Lower numbers of supervisors receiving remunerations;
- (4) Lower numbers of directors receiving remunerations.

The test result shows item 4 of Group 2 with ACs is statistically significant.

Item 4: Here, a negative relationship is assumed, in that the greater number of directors receiving remuneration will lead to a lower market response to earnings. The results for Group 2 show a p value 0.014 and a negative coefficient -3.93 and positively support this assumption with significance. This result supports the hypothesis that listed companies with AC will have higher levels of independence

than companies without ACs.

#### ■ (B) Expertise

Four indicators of expertise are included as items 5-8 to examine if Group 2 companies with ACs have more financial, legal and internal audit expertise but lower numbers of party-member employee supervisors without financial, legal and internal audit expertise than Group 1 companies without ACs. The test shows significant result that for item 6-7, namely legal and internal audit expertise.

Item 5: Legal expertise is measured by the percentage of supervisors to have legal expertise (exp2). A positive relationship is assumed, in that more supervisors with legal expertise of SBs will lead to higher market response to earnings. The result of Group 2 with p value 0.045 and coefficient 268.70 positively support this assumption with significance.

The result of this comparison supports the assumption that Group 2 companies with ACs have more legal expertise than Group 1 without AC. This result may be explained in that listed companies with ACs recognize that Chinese regulations require a legal background in performing supervisory functions. The companies who added ACs have increased the legal expertise of SB in implementing supervisory functions.

Item 6: Internal audit expertise (exp3): a positive relation is assumed, whereby more supervisors with internal audit expertise will lead to a higher market response to earnings. The result of Group 2's test with p value 0.008 and coefficient 178.38 positively support this assumption at highest significance. The results show that in Group 2, listed companies with ACs have more internal audit expertise in performing supervisory functions than Group 1 without ACs.

#### ■ (C) Activities

Three variables for supervisory activities, items 9-11, are tested to compare between Group 2 with ACs and Group 1 without AC for the link between SB size and frequency of SB meetings and frequency of BoD meeting and supervisory effectiveness. The test result shows that item 9-10 with significance as follows:

Item 9: The SB size (num1): A positive relationship is assumed, whereby larger SBs will enjoy higher levels of market response to earnings. The result for Group 1 has a p value of 0.048 and a negative coefficient -6.96, which is contrary to the assumption with significance. It may be explained that the quantity of supervisors cannot ensure the effectiveness of supervisory functions to increase market response to earnings. The quality of supervisory functions may be not decided by the quantity of SB members. It may be explained that SBs in Group 2 with ACs bear more supervisors and have more effective supervisory functions, judging by market response to earnings. The effectiveness of supervisory functions in China may be developed by the two institutions together. This finding suggests that after adding in ACs companies increase the size of SBs to enhance the effectiveness of supervisory functions, though the effectiveness of supervisory functions may not be decided specifically by the size of SBs. ACs cannot entirely replace

the SBs in China at present.

Item 10: The SB meeting frequency (mt1): a positive relationship is assumed, whereby more regular meetings will result in a higher market response to earnings. The result of Group 1 without ACs, p value 0.000 and positive coefficient 11.45, positively supports this assumption with highest significance. The explanation may be that listed companies without ACs have to run supervisory functions through SBs only. The operations of SBs in Group 1 without ACs are not merely rubber stamps, given more meetings than Group 2 with ACs. Yet the companies after adding ACs do not increase the activities of meetings of SBs to improve the effectiveness of the overall supervisory functions in China. It seems that ACs still cannot supersede the SBs in China at the current stage for the SBs in the G1 without ACs still work out its functions as reflected in more meeting times.

#### ■ (D) Control Variables

For the control variables at items 12-15, it is expected that the group 2 with ACs has better performance of supervisory function, leading to lower debt, higher growth in total assets, higher rate of return on assets, and bigger firm size than group 1 without ACs. A significant difference is found for item 15, firm size.

Item 15: Firm size is evaluated through the natural logarithm of the assets ( $\ln_{(Asset)}$ ): a negative relationship is assumed, whereby larger firms will have lower fluctuation (more stable) market responses to earnings. The results of Group 1 with p value 0.026 and negative coefficient -10.21 with second significance and Group 2 with p value 0.000 and negative coefficient -20.31 with highest significance are consistent with the expectation that there is a negative relationship between firm size and market response to earnings: larger companies will have more stable market response to earnings.

## 4. Conclusion and Discussion

This paper is aimed to answer the question whether the listed companies with ACs are more effective than those without ACs in China? This study empirically compares two groups of China's supervisory mechanisms. Using a panel data base of 2148 compared to 1873 firm-year observations over the 2005 to 2007 period by the multiple linear regressions, the findings report that though the AC is started and developed from west countries based on the agency theory, which is different from the Chinese institutional ownership theory. Under different ownership structure, the test results report that the ACs still have contributions on effectiveness in China. This study has compared two systems with and without ACs in China and concluded that Chinese listed companies with ACs have better independence, expertise and activities proved by 12 of 15 variables of better G2 coefficient than G1 and statistically significant evidences present in 5 aspects: the listed companies have (1) lower proportion of independent directors receiving remuneration; (2-3) more legal and internal auditing expertise in SBs; (4)

more meeting times on the BoD; and (5) the quantity of the size of SBs may not impact upon the effective quality of internal supervisory functions. The summary of the analysis is listed by the AC's characteristics as:

**Independence:** In addition to all of four independence variables prove G2 coefficient better than G1, especially reports that G2 of independent directors receiving remunerations shows significance, yet no significance shows in Group 1 without AC. The listed companies after adding in ACs decrease the proportion of independent directors receiving remuneration with significance. Overall the test results and the result with significance of independence reveal and highlight G2 is better than G1 both prove the hypothesis.

**Expertise:** The test results on legal and internal auditing expertise of SBs are the same as the hypothesis. Specially, listed companies after adding in ACs increase the legal and internal auditing expertise in SBs with positive impact significance respectively. The AC enhances the effectiveness of supervisory functions in China with significance.

**Activities:** The test results on the meeting times of SBs present G1 with more activity than G2 adverse to the hypothesis with significance. Meanwhile, G2 the companies after adding in ACs have more activities of meeting times on BoD to improve their effectiveness. The test result on the sizes of SBs present  $G2 > G1$  the same as the hypothesis, yet it is interesting with adverse significance in G1. Companies after adding in ACs do not increase the size and the meeting times of SBs. The adverse may be explained that quantity of the size of SBs may not be factors impacting on the effective quality of internal supervisory functions.

The other variables with no significance leave room for more research such as independent directors' percentage, the percentage of shareholdings by the supervisors and expertise with financial and accounting literacy. Why is the result of Chinese setting different from the western literatures? How to enhance the effectiveness of supervisory mechanism of corporate governance in China? Cho & Rui (2009) noticed that findings like these suggest that, while theories and findings from non-Chinese settings do provide a useful point of departure for understanding corporate governance relationships and effect in China, they are far from adequate for unearthing the complexities and intricacies of this phenomenon. Questions like these relate to the "hows" and "whys" behind phenomena, and addressing them will require going beyond examining cross sectional differences in effects. As such, there is room for other modes of investigation, such as in-depth interviews, field studies/direct observation, and detailed analyses of archival records (Yin, 1989).

In addition to the defined three attributes of the literature and regulations, this paper has also input three independent variables of party-member employees, legal and internal audit expertise and prove that listed companies after adding in ACs increase the legal and internal audit expertise in SBs with positive impact significance respectively and decrease

the party member employees after adding in ACs, which may contribute to future research on evaluating the effectiveness of supervisory functions and this paper may serve as a useful reference for undertaking similar studies on this topic in the future. Meanwhile, both results may light up the further research for the necessity of maintaining SBs in China. The test results for firm size with significance in both samples may contribute to future academic research on evaluating the effectiveness of supervisory functions and suggest that there would be value in further research to test more directly the relationship between firm size and the effectiveness of supervisory functions. Such research could examine whether the larger companies have more effective supervisory functions and whether listed companies with ACs have more effective supervision, which in turn creates conditions conducive to growth in firm size.

In sum, the findings in this paper and its related comments on the interpretation of those findings and suggestions based upon them may be useful reference to practitioners such as regulators, supervisors, or BoDs in considering whether to establish ACs as governance structures within Chinese companies, and the methods for improving supervisory functions to strengthen investors' trust by establishing ACs. Finally, the investigation and results reported in this paper may offer a basis for continuing research on the willingness to implement an AC and the amount of confidence in supervisory governance thereafter, and for studies of other monitoring functions such as audit and internal control.

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